

Limited access in the form of a one-way closures, restricted day closures are likely to be needed during times of heavy vehicle use.

The public road upgrade is expected to take some time to build and will involve heavy earthworks machinery and staged restricted day closures are expected from time to time.

The upgrade will be carefully planned to minimise as much disruption as well as providing a safe passage for the general public when safe to do so. MCWFL will provide daily access to all affected residents and will work with the affected landowners to ensure their business are not adversely impacted. The proposed closure will be from 8am to 12pm and 1pm to 5pm.

Residents will be allowed access through the closure with instruction from the TMC who will be in radio communication with the site.

Residents will also be able to co-ordinate with the contractor to ensure that access is given to their contractors and employees to maintain business operations i.e., stock trucks.

A stop / go set up will be established at the intersection of Kate Valley where a TM operative will control who enters the site. Allowed site traffic will be allowed to move forward of this closure to avoid the access to Kate Valley being affected.

6.3.2 Stop / Go

The section of road marked as site access to approximately RP6.8 in Figure 10 below is a steep section of road with many bends and is too narrow for safe two-way construction traffic. Due to this, this section is also the focus of the Mt Cass Rd upgrade which will involve a stop/go or restricted closure. This will be confirmed when the detailed design has been completed and the full extent of works is known.

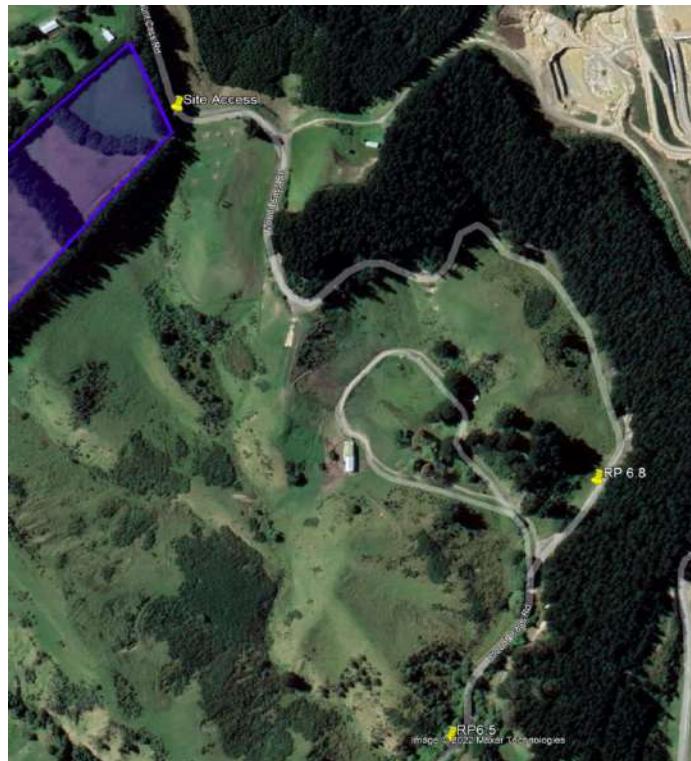


Figure 10 MT Cass Rd RP Approximate Locations

6.3.3 Priority Give Way

To control traffic on the narrow one lane, bridge a priority system will be put in place giving priority to vehicles approaching from the downhill direction.

6.3.4 Temporary Speed Limit

A TSL of 30kph will be put in place between Kate Valley and the Site. This is to help mitigate the risk of vehicle collisions on the wider section of the road between the Kate Valley turn off and the stop / go control at RP6.8.

6.3.5 Radio Communications

Communication between trucks and TMC will be via radio telephone. TMCs will be responsible for stopping and communicating with site light vehicles and residents who do not have radios. Trucks will also be able to communicate any hazards and pedestrians that they encounter between TMC to other heavy vehicles within the closure.

6.3.6 Pedestrians

The remote nature of the road means that use by pedestrians will be very limited. The traffic management outlined above is believed to be sufficient to manage pedestrians if they are encountered.

For the duration of the project the areas of the Mt Cass Walkway that enter onto the project site will be closed to exclude pedestrians from the construction site.

The Tiromoana walkway will remain open for the duration of the project as this does not enter the construction site.

6.3.7 Cyclists

The remote nature of the road means that use by cyclists will be very limited. The traffic management outlined above is believed to be sufficient to manage cyclists if they are encountered.

6.3.8 Dust

Dust will be controlled by implementing the 30kph TSL, use of a water cart if required and by surfacing of the Mt Cass Rd upon completion of the upgrade works. Refer to the MCWFL Dust Management Plan which is subplan B2 of the construction management plan.

6.3.9 Truck Waiting

The intention of the restricted assess closure is to allow the TMC to stack trucks along the straight section of road after the Kate Valley turn off where there is sufficient width to park trucks and have traffic pass them in the opposite direction.

6.3.10 Site Parking

There will be dedicated staff parking in both the Symonds Rd Construction Yard and the main construction camp.

7. Roles and Responsibilities

Table 5 below details the responsibilities of the key project personal involved in administering this plan during the project.

Role	Role Responsibilities
MCWFL Project Director	Is responsible for negotiating the agreement between MCWFL and Transwaste (Kate Valley) Consult community liaison group.
MCWFL Construction Manager	Point of contact for complaints and any maintenance in line with the agreements with NZTA and HDC. Arrange dilapidation surveys with HDC / Kate Valley Facilitate community consultation / notification of TMP
Civil Works Project Manager	Monitor and implement required traffic management procedures. to facilitate site access to the construction laydown and main site access. Engage a traffic management company to design and install traffic management for the civil scope of the project. Co-ordinate and co-operate with other contractors to help facilitate their required TM. Apply for and maintain the Corridor access request (CAR) – For their scope of work.
Electrical Project Manager	Engage a traffic management company to design and install traffic management for the civil scope of the project. – Symonds Rd cable crossing Co-ordinate and co-operate with other contractors to help facilitate their required TM. Apply for and maintain the Corridor access request (CAR) – For their scope of work.
Mt Cass Road Upgrade Manager	Monitor and implement required traffic management procedures. to facilitate the upgrade of Mt Cass Rd. Co-ordinate with other MCWFL contractors to ensure that site access is maintained and there are no delays to the construction programme. Engage a traffic management company to design and install traffic management for the civil scope of the project. Add their TMP to the Civil contractors CAR.
S&I Project Manager	Is responsible for all Wind Turbine Movements from port to the construction laydown and then to site. Design and implement TMP for site exit when moving WTG from construction laydown to site. Add TMP to Civil Contractors CAR
STMS	Has overall responsibility for the physical traffic management layout, compliance, safety and maintenance of the TTM under their control. Is responsible for ensuring that the personnel engaged to carry out traffic management duties are suitably qualified.
HDC	Overall control of the operational side of the road i.e., dealing with crashes, blocked culverts and general maintenance beyond the road surfacing.

Table 5 Traffic Management Roles and Responsibilities

8. Programme of Construction Works

The construction start date is to be confirmed, but the likely start date will be in the last quarter of 2023. The overall construction duration is anticipated to last approximately 18 months.

Table 6 below shows the main sections of work that require traffic management and their indicative start and finish dates.

In the construction period the initial site mobilisation will see some moderate oversized loads being delivered in the form of earthmoving plant and deliveries of imported fill.

The end of the programme will see the greatest oversized deliveries when the turbines are delivered to the site.

Scope	Start	Finish
Construction Yard Symonds Rd	January 2024	April 2024
Civil Construction	November 2023	October 2024
Mt Cass Rd Upgrade	November 2023	October 2024
WTG Installation	September 2024	April 2025

Table 6 Indictive Construction Programme

9. Co-ordination of Traffic Management

Due to the multi-contractor model co-ordination and co-operation will be required between the contractors to achieve the outcomes of the project and to ensure that traffic management is suitably designed and well maintained.

The intention is that the cBoP contractor who will mobilise to site first and will have the longest presence on the site will apply the CAR and then the other contractors will communicate with the cBoP contractor to add their required TMPs on to the CAR.

Where possible the same traffic management contractor will be used to allow simplicity in planning.

Traffic management requirements will be discussed and agreed at a weekly project planning meeting.

MCWFL will act as the final decision maker when there are conflicts with traffic management requirements that cannot be resolved by the contractors. An example of this may be when there are competing programme issues that MCWFL may need to assess on a best for project outcome.

10. Dilapidation Survey

Before any construction work being undertaken, a dilapidation survey will be undertaken with the relevant entity responsible for the maintenance of the road, MCWFL and the relevant contractor.

A report of any defects, along with the photographic records, will be submitted to all relevant parties as a record before construction starts. Upon completion of construction or between changes in a contractor, a similar inspection will be undertaken, and any defects as a direct result of construction use noted with clear remedial actions and responsibilities agreed.

10.1 HDC Maintained Assets

A dilapidation survey will be arranged with HDC to inspect the following areas

1. HDC Maintained roading assets between SH1 and the Wind farm site entrance.
2. Symonds Road intersection with Mt Cass Rd.

MCWF is to complete a preconstruction walkover with the Council, reviewing the current road condition. Close attention will be paid to the condition of their existing assets, i.e., fencing, road surface, signage, safety features, culverts etc. Any pre-existing damage, in terms of cost share will be discussed with HDC at this time.

Until the road is upgraded (and while a CAR is in place) , MCWF will be responsible to hold / maintain the road to the base line preconstruction level.

10.2 Transwaste Maintained Assets

A dilapidation survey will be arranged with Transwaste to inspect the following areas

1. Mt Cass Rd from the intersection with SH1 to the Kate Valley turn off.

11. Monitoring and Maintenance During Construction

As part of the control measures, on-going site monitoring by the contractor and wider project team will be undertaken. This will ensure that all the control measures detailed in this plan have been properly implemented and are functioning effectively and meet CoPTM requirements. If controls are deemed to no longer be required due to changes in site conditions, then they will be changed to provide suitable risk mitigation and reduce disruption to stake holders.

Monitoring shall occur for the full duration of the works with daily inspections undertaken. This includes not only during the Mt Cass Road upgrade works, but for the entire duration that the road is used for the purposes of construction access. Any control measures requiring maintenance or adaptation to allow construction tasks to occur shall be identified and implemented by the STMS to ensure continual compliance.

As part of the site induction, all personnel will be encouraged to report any damage noticed to the roads, excessive dust hindering visibility and incidents or near misses to the Project Manager.

The individual contractors will be responsible for operations and maintenance of their respective scopes of work under this plan.

12. Audits

In addition to the site inspections required to be undertaken by the STMS. Monthly site audits will be carried out by the Traffic management contractor.

The Contractor who has engaged the Traffic management contractor will also carry out monthly site safety audits which are part of their internal systems. These monthly audits will include inspections of traffic management.

13. Consultation

13.1 Stakeholder Consultation

MCWFL have commenced discussions with Transwaste to reach a fair agreement. The cost share agreement will be in place prior to commencing onsite and the outcome will be sent to HDC. This document will be confidential between both parties.

HDC have been consulted on the planned upgrade works and will be involved in the generation of the TMP for the public road upgrades. The wind turbine subcontractor will also be involved in consulting with the relevant council team in regard to the over dimensional overweight vehicles.

Waka Kotahi will be consulted regarding the relevant permits that are required for the wind turbine generator (WTG) components.

The landowners and key shareholder will be informed of the planned WTG component and delivery to minimise the impact to the road users.

The Community liaison group will review this plan as part of the CMP review required under the consent.

14. Complaints

14.1 Complaints Process

The Consent Holder shall establish and publicise contact details for a liaison officer, so that members of the local community have a specified and known point of contact should they wish to raise any issues that may arise during construction and operation of the wind farm. A logbook detailing all calls and any action taken shall be kept and made available to Hurunui District Council on request.

Detail MCWFL Complaints process:

1. Complaint issued via
 - a. Website <https://www.mtcasswindfarm.co.nz/contact-us>,
 - b. Phone 0800 309080 - Greg Gummer Project Director / liaison officer
 - c. Direct engagement from site staff via contact details provided at the project notice board at the site entrance.
 - d. Hurunui District Council 03 314 8816
2. MCWFL direct complaint to the relevant contractor or address inhouse if operational
 - a. As soon as the complaint is received it will be recorded on the project complaints register with the client also notified, if made via site staff.
 - b. An initial response will be made and recorded. Depending on the nature of the complaint the initial response could be to immediately cease the activity pending investigation. However, in most cases it might not be practicable to provide

immediate relief. The complainant, council and the client will be informed of actions taken. Contact details for council are recorded in the overall construction management plan.

- c. Where the initial response does not address the complaint, further investigation, corrective action and follow-up monitoring shall be undertaken as appropriate. The complainant, council and the client will be informed of actions taken.
3. Record complaint on complaints register at noted in 14.2 below.
4. Rectify issue.
5. Provide feedback and closes out on register.

14.2 Complaints Register

A register for any complaints about the construction activities and operation of the wind farm received by the Consent Holder including complaints in relation to traffic. The register shall record, where this information is available:

- The date, time and duration of the incident that has resulted in a complaint.
- The location of the complainant when the incident was detected.
- The possible cause of the incident.
- Any corrective action undertaken by the Consent Holder in response to the complaint, including timing of that corrective action.
- The date and details of the response given to each complainant.

The complaints register shall be available to the Council and the Community Liaison Group at all reasonable times upon request.

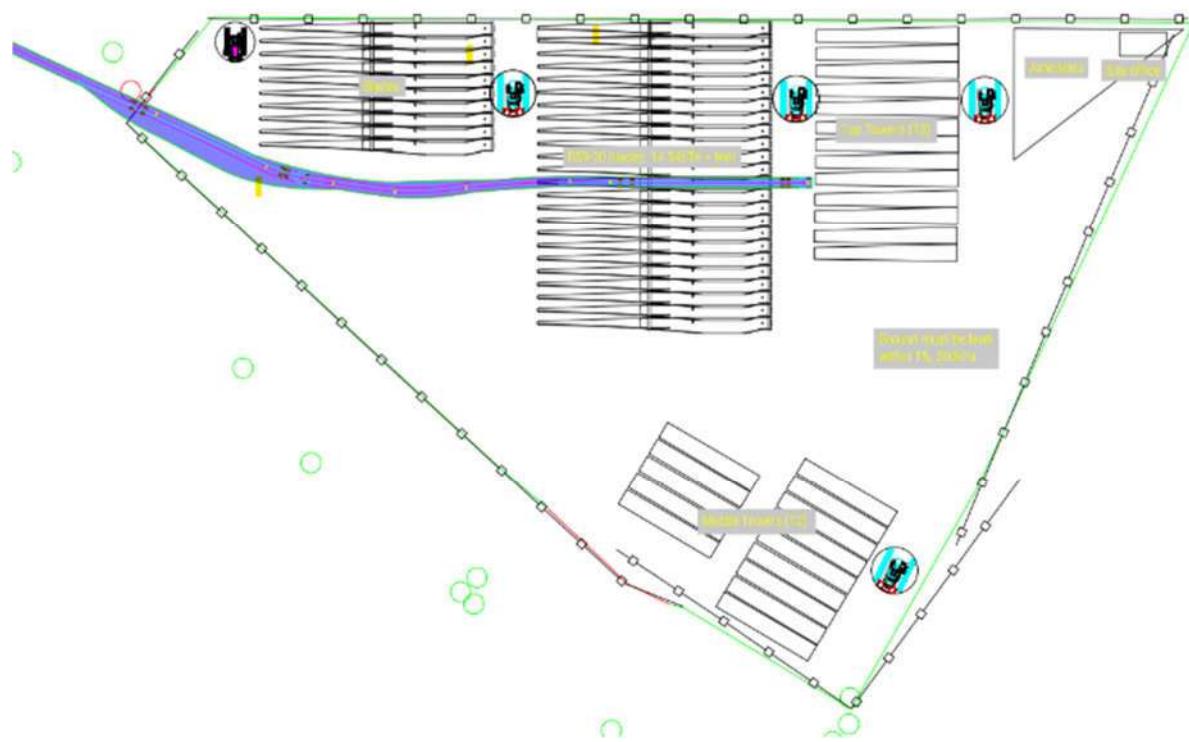
Within 5 days of receipt of any complaint in accordance with condition [155], the Consent Holder shall advise the Hurunui District Council of the details of any complaint received and, where appropriate, of any remedial or corrective action taken, including the response provided to the complainant.

A template of this register is available in the Construction Management Plan Appendix A.

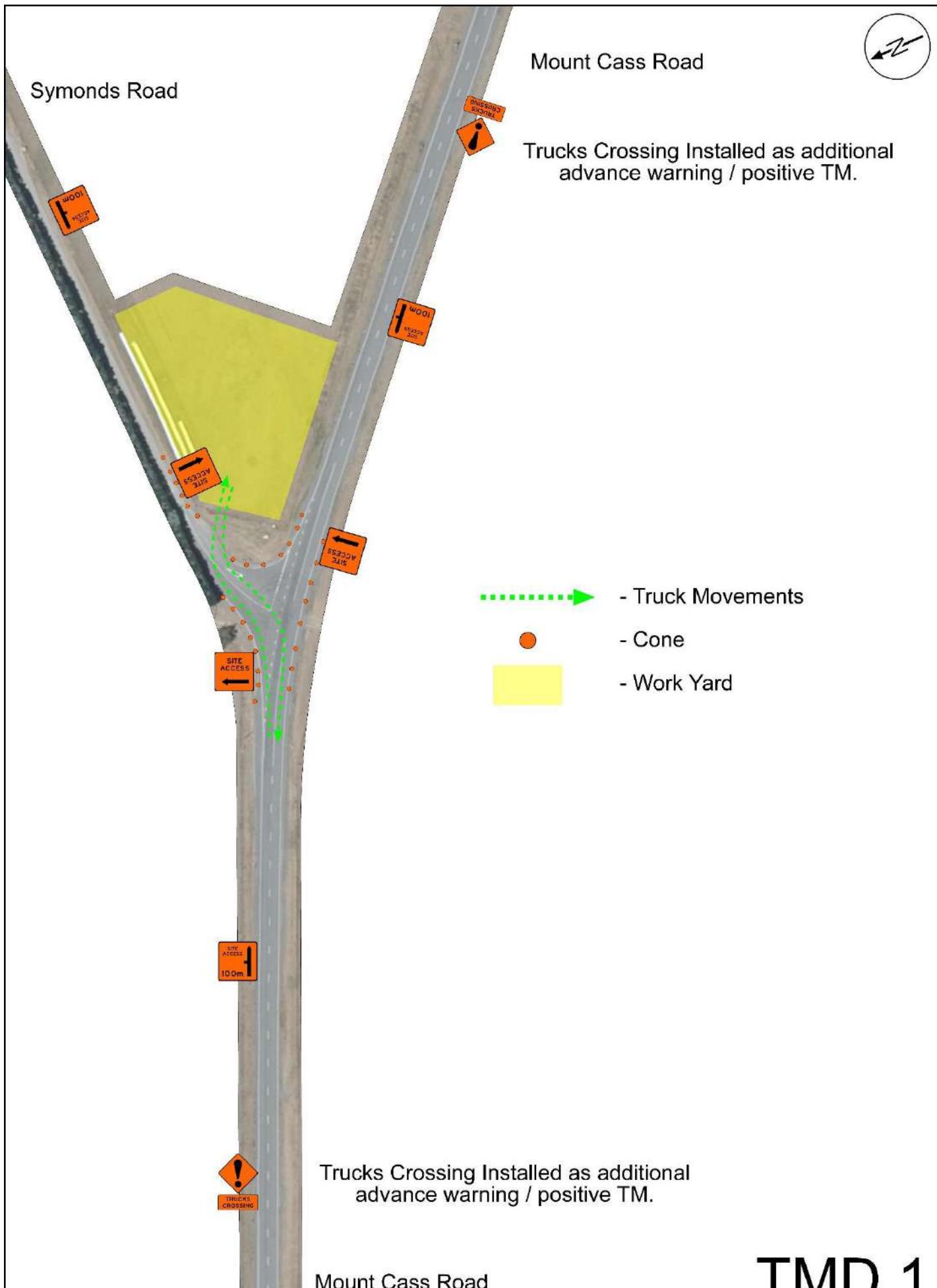
15. Appendices

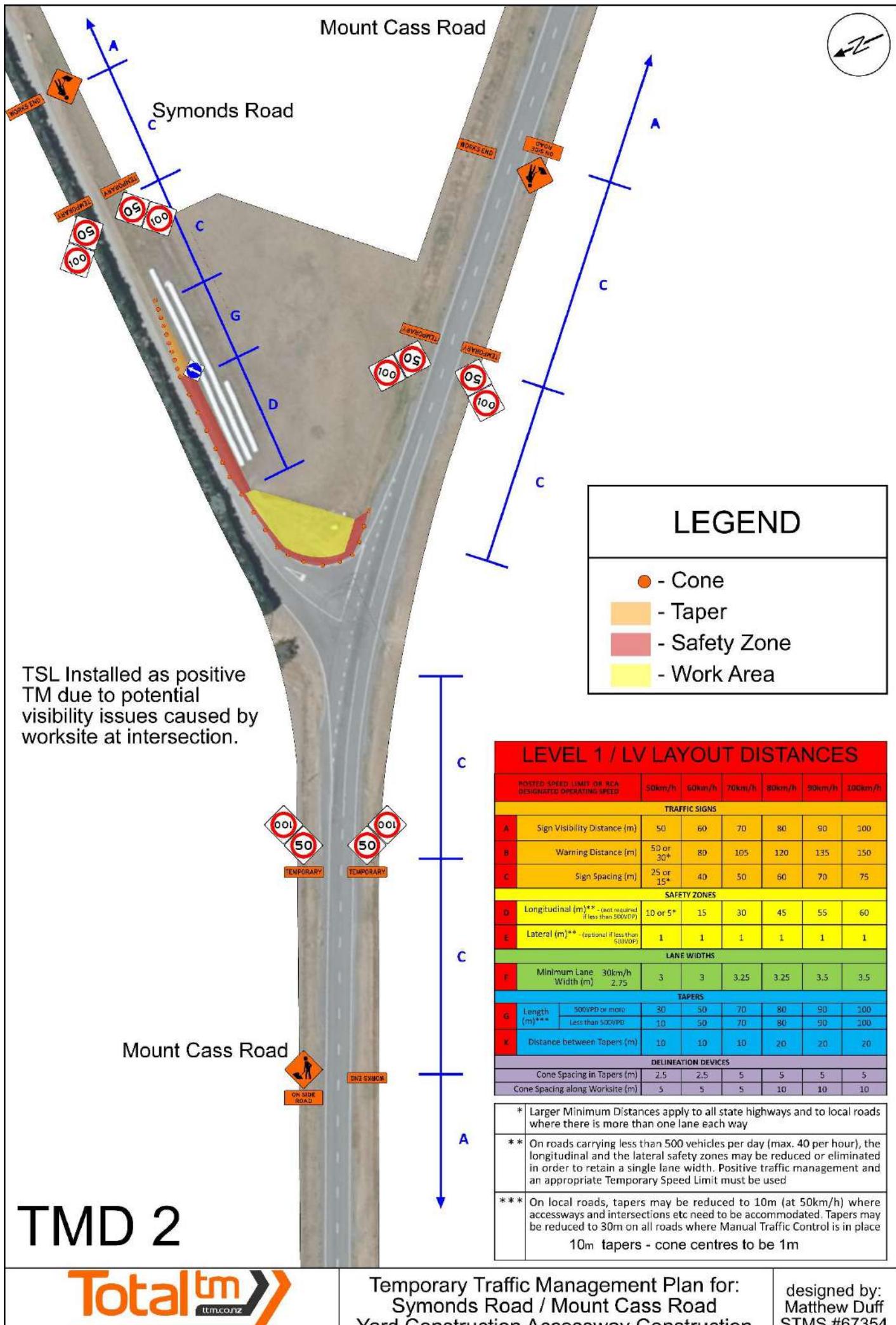
Appendix	Description
A	Proposed Laydown Area
B	Site Specific Traffic Management Plans

APPENDIX A – Symonds Construction Yard



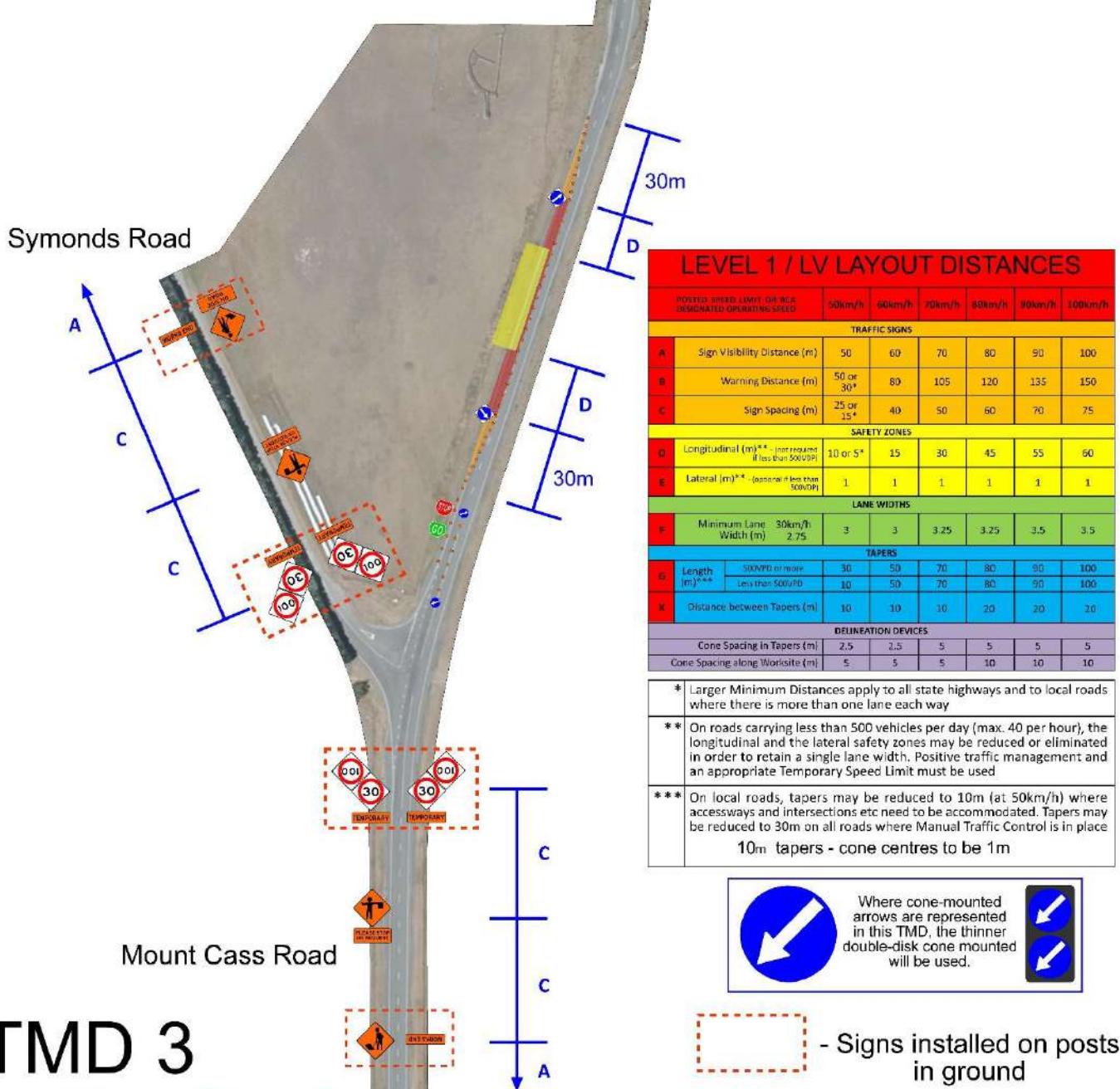
APPENDIX B – Site Specific Traffic Management Diagrams





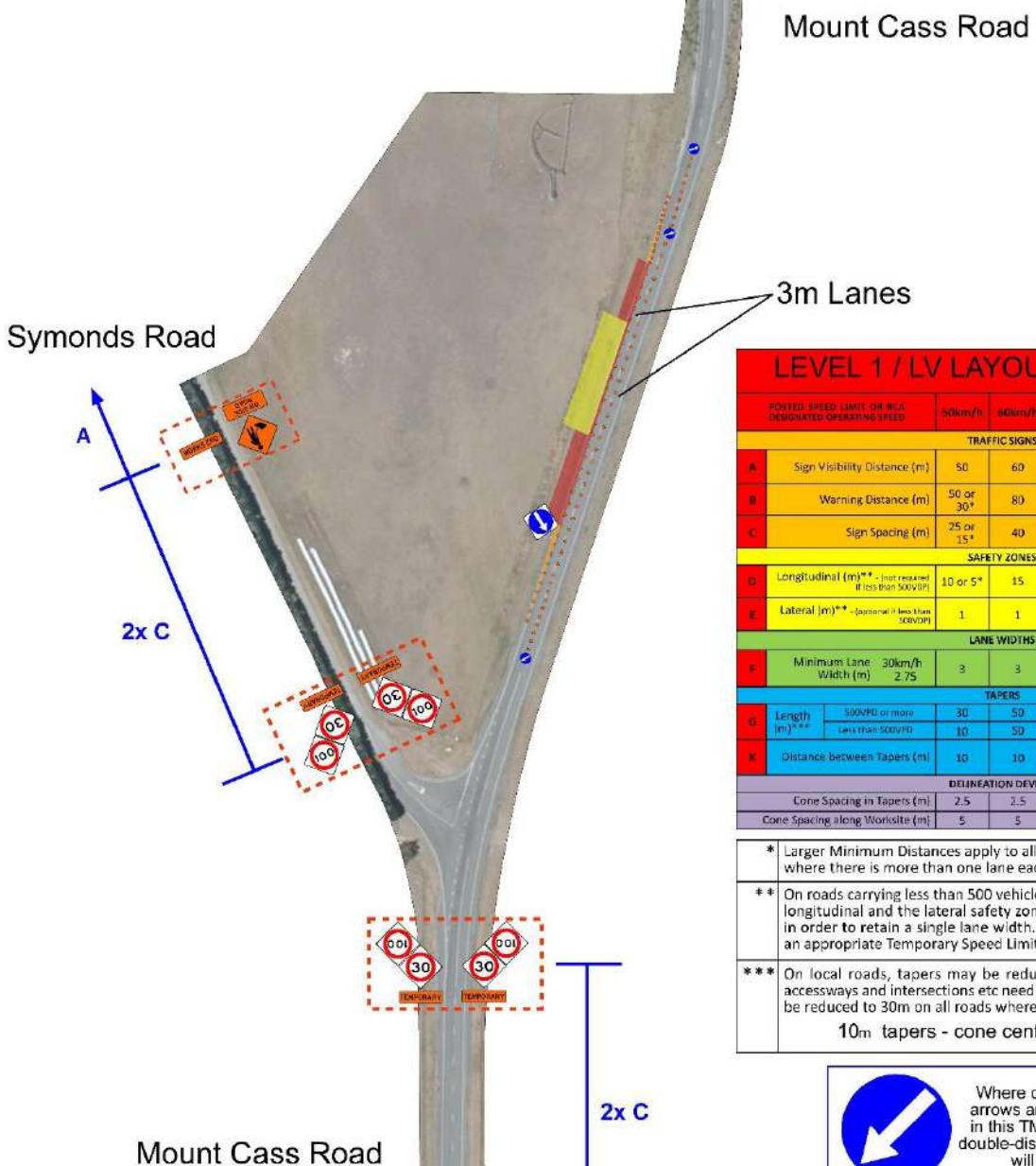
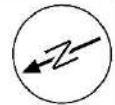


May be installed further up road at STMS's discretion during MTC operation.

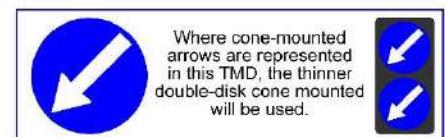


LEGEND

- - Cone
- - Taper
- - Safety Zone
- - Work Area



LEVEL 1 / LV LAYOUT DISTANCES							
ROTATED SPEED LIMIT OR AREA DESIGNATED OPERATING SPEED		50km/h	60km/h	70km/h	80km/h	90km/h	100km/h
A	Sign Visibility Distance (m)	50	60	70	80	90	100
B	Warning Distance (m)	50 or 30*	80	105	120	135	150
C	Sign Spacing (m)	25 or 15*	40	50	60	70	75
SAFETY ZONES							
D	Longitudinal (m)** - (not required if less than 500VDP)	10 or 5*	15	30	45	55	60
E	Lateral (m)** - (not required if less than 500VDP)	1	1	1	1	1	1
LANE WIDTHS							
F	Minimum Lane Width (m) 30km/h	2.75	3	3	3.25	3.25	3.5
TAPERS							
G	Length (m)*** - (less than 500VDP)	30	50	70	80	90	100
H	Distance between Tapers (m)	10	10	10	20	20	20
DELINEATION DEVICES							
Cone Spacing in Tapers (m)		2.5	2.5	5	5	5	5
Cone Spacing along Worksite (m)		5	5	5	10	10	10
* Larger Minimum Distances apply to all state highways and to local roads where there is more than one lane each way							
** On roads carrying less than 500 vehicles per day (max. 40 per hour), the longitudinal and the lateral safety zones may be reduced or eliminated in order to retain a single lane width. Positive traffic management and an appropriate Temporary Speed Limit must be used							
*** On local roads, tapers may be reduced to 10m (at 50km/h) where accessways and intersections etc need to be accommodated. Tapers may be reduced to 30m on all roads where Manual Traffic Control is in place							
10m tapers - cone centres to be 1m							



TMD 4



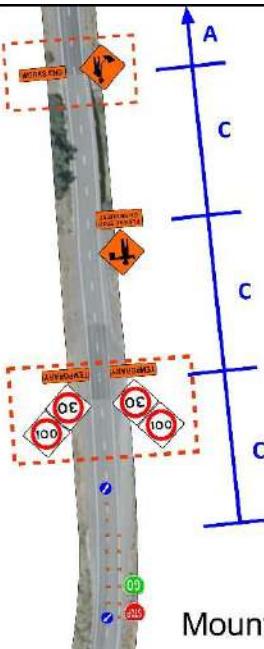
- Signs installed on posts in ground



May be installed further up road at STMS's discretion during MTC operation.

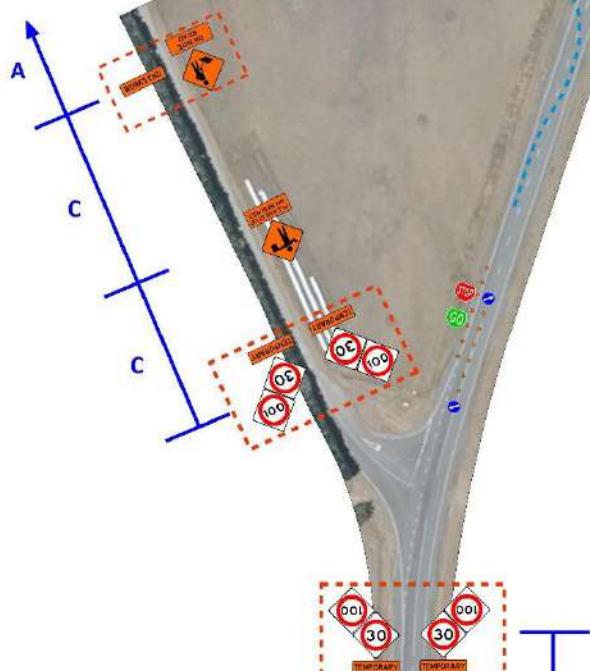


MTC's to be on Stop/Stop as required for large vehicle movements in and out of site.



Mount Cass Road

Symonds Road



Mount Cass Road

LEVEL 1 / LV LAYOUT DISTANCES							
POSTED SPEED LIMIT OR AREA DESIGNATED OPERATING SPEED		50km/h	60km/h	70km/h	80km/h	90km/h	100km/h
A	Sign Visibility Distance (m)	50	60	70	80	90	100
B	Warning Distance (m)	50 or 30*	80	105	120	135	150
C	Sign Spacing (m)	25 or 15*	40	50	60	70	75
SAFETY ZONES							
D	Longitudinal (m)** (not required if less than 500m)	10 or 5*	15	30	45	55	60
E	Lateral (m)** (optional if less than 500m)	1	1	1	1	1	2
LANE WIDTHS							
F	Minimum Lane Width (m)	30km/h 2.75	3	3	3.25	3.25	3.5
TAPERS							
G	Length (m)***	500m or more (less than 500m)	30	50	70	80	90
H	Distance between Tapers (m)	10	10	10	20	20	20
DELINEATION DEVICES							
	Cone Spacing in Tapers (m)	2.5	2.5	5	5	5	5
	Cone Spacing along Worksite (m)	5	5	5	10	10	10

- * Larger Minimum Distances apply to all state highways and to local roads where there is more than one lane each way
- ** On roads carrying less than 500 vehicles per day (max. 40 per hour), the longitudinal and the lateral safety zones may be reduced or eliminated in order to retain a single lane width. Positive traffic management and an appropriate Temporary Speed Limit must be used
- *** On local roads, tapers may be reduced to 10m (at 50km/h) where accessways and intersections etc need to be accommodated. Tapers may be reduced to 30m on all roads where Manual Traffic Control is in place

10m tapers - cone centres to be 1m



Where cone-mounted arrows are represented in this TMD, the thinner double-disk cone mounted will be used.

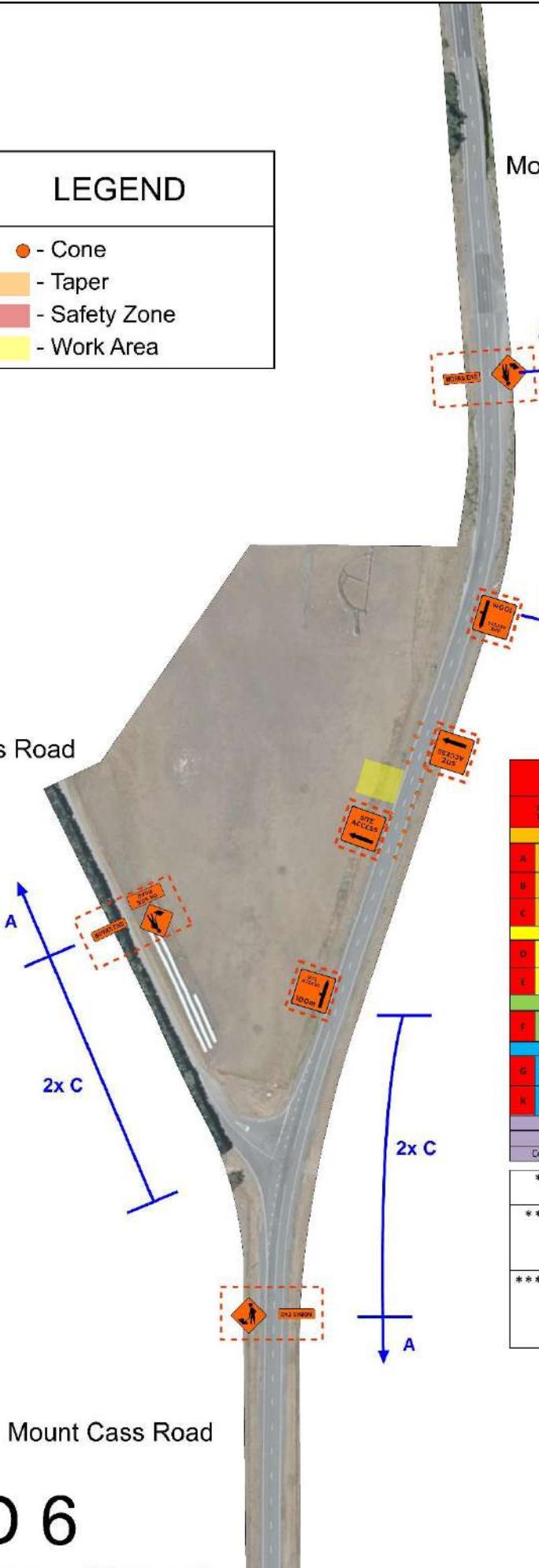


- Signs installed on posts in ground

TMD 5



Symonds Road



Mount Cass Road

LEVEL 1 / LV LAYOUT DISTANCES

POSTED SPEED LIMIT OR RIC DEMONSTRATED OPERATING SPEED		50km/h	60km/h	70km/h	80km/h	90km/h	100km/h
TRAFFIC SIGNS							
A	Sign Visibility Distance (m)	50	60	70	80	90	100
B	Warning Distance (m)	50 or 30*	80	105	120	135	150
C	Sign Spacing (m)	25 or 15*	40	50	60	70	75
SAFETY ZONES							
D	Longitudinal (m) ** - (not required if less than 500vPD)	10 or 5*	15	30	45	55	60
E	Lateral (m) *** - (optional if less than 500vPD)	1	1	1	1	1	1
LANE WIDTHS							
F	Minimum Lane Width (m)	3.00m/h 2.75	3	3	3.25	3.25	3.5
TAPERS							
G	Length (m) *** - (less than 500vPD)	30	50	70	80	90	100
H	Distance between Tapers (m)	10	10	10	20	20	20
DELINEMENT DEVICES							
Cone Spacing in Tapers (m)		2.5	2.5	5	5	5	5
Cone Spacing along Worksite (m)		5	5	5	10	10	10

* Larger Minimum Distances apply to all state highways and to local roads where there is more than one lane each way.

** On roads carrying less than 500 vehicles per day (max. 40 per hour), the longitudinal and the lateral safety zones may be reduced or eliminated in order to retain a single lane width. Positive traffic management and an appropriate Temporary Speed Limit must be used.

*** On local roads, tapers may be reduced to 10m (at 50km/h) where accessways and intersections etc need to be accommodated. Tapers may be reduced to 30m on all roads where Manual Traffic Control is in place
10m tapers - cone centres to be 1m



Where cone-mounted arrows are represented in this TMD, the thinner double-disk cone mounted will be used.



- Signs installed on posts in ground

TMD 6



Temporary Traffic Management Plan for:
Site Access with TSL
Mount Cass Road

designed by:
Matthew Duff
STMS #67354

Appendix J

B7 Fire Management Plan



Mt Cass Wind Farm

Fire Management Plan



Revision 11 – 22 March 2023

This document has been prepared for the benefit of Mt Cass Wind Farm Ltd (MCWF). No liability is accepted by this company or any employee or sub-consultant of this company with respect to its use by any other person. This disclaimer shall apply notwithstanding that the report may be made available to other persons of an application for permission or approval to fulfil a legal requirement.

Revision History

Version	Description	Date	Prepared by	Approved By
Rev 4	For Inclusion in EMP	28 Sep 2020	Henry Willis	-
Rev 5	Comments from MCWF	22 Oct 2020	Henry Willis	-
Rev 6	Updated following Review	3 Nov 2020	Henry Willis	-
Rev 7	Updated following FENZ Review	19 Nov 2020	Henry Willis	-
Rev 8	Updated following CLG Review & HDC Independent Reviewer Review	17 Dec 2020	Henry Willis	Scott Bennett
Rev 9	Updated following cBoP Contractor Review	7 Dec 2022	Henry Willis	Scott Bennett
Rev 10	Incorporates Stantec Review	11 Jan 2023	Henry Willis	Scott Bennett
Rev 11	Post CLG Review and HDC Submission amend Waipara Fire Brigade number	22 Mar 2023	Michael Carstens	Greg Gummer

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1. Introduction

1.1 Purpose

The purpose of this Fire Management Plan (FMP) is to inform people involved in the Mt Cass Wind Farm how to control and reduce the possibility of fire on the site and to specify what equipment may be used in case of a fire.

The plan covers all phases of wind farm development including detailed design, construction and operation. Fire Management is an integral part of environmental management at the site and this plan is accordingly part of the Environmental Management Plan. However, given that aspects of construction and operations are potential fire sources it is also seen as integral to Construction Management and Operations Management.

Although the main aim of fire control is preservation of life, it is also the case that Mt Cass is a valuable site for native biodiversity which could be severely damaged by fire. Appropriate management of the fire risk is therefore crucial in maintaining the biodiversity.

The plan is also required to meet the requirements of the resource consent conditions, specifically Condition 121 which requires the plan to include:

- a) The names and contact details of the Ashley Rural Fire Authority (Now FENZ)¹
- b) Other relevant contact details (of the organisations set out in appendix G of the Ashley Rural Fire District Plan 2009-2011) (Now FENZ)
- c) A description of the sources of water to be used in fire fighting
- d) A requirement for the provision on site of a water point of at least 30,000 litres of water
- e) Requirement for at least one vehicle with a minimum capacity of 200 litres onsite during periods of extreme fire risk
- f) Ensuring adequate protection is in place prior to undertaking any activities authorised by the consent, including any preliminary geotechnical investigations.

1.2 Site Fire Management Overview

Fire Management is the primary responsibility of the MCWF Construction Manager and begins with hazard awareness and risk minimisation.

This plan is an over-arching Management Plan and will be expanded upon as required for specific activities on site.

The plan sets out Fire Risks and associated Management Processes to mitigate the identified Project Risks.

Resource Consent Condition 120 requires that the Department of Conservation be consulted in the development of the Fire Management Plan.

¹The New Zealand Fire Service, the National Rural Fire Authority, and the rural fire districts and territorial authorities including Ashley Rural Fire Authority amalgamated to form Fire and Emergency New Zealand (FENZ) in 2017.

In addition, Resource Consent Condition 120 requires the Ashley Rural Fire Authority and the Principal Rural Fire Officer of the Hurunui District Council, or such authority as may replace any one of these authorities, as parties responsible for the management of rural fires within and on land adjoining the footprint, shall be consulted during the development of the Fire Management Plan. These authorities have amalgamated to become Fire and Emergency NZ (FENZ) and FENZ will be the authority that is consulted on the development of this plan going forward.

In addition, FENZ will be provided with detailed information on site access and track locations. This information will be updated throughout the life of the project. The location of water storage ponds and water tanks that can supply water for firefighting purposes will be clearly identified.

During construction, the MCWF Construction Manager will be responsible for ensuring that this Fire Management Plan is correctly implemented by the relevant Contractor(s) and will review all documentation relating to fire risk before it is finalised and issued.

Site induction for all personnel must include a briefing on fire safety including the main content of this plan and any SOP's relevant to the task being performed.

In the event of a fire, details of the emergency response will be covered in the Emergency Response Plan.

1.3 The Site

The Mt Cass ridge is a prominent ridge defining the seaward side of the Waipara Basin. Mt Cass is approximately 5 km south east of Waipara town and the ridge trends east-north-east and runs parallel to State Highway 1 ending near Omihi. The wind farm (refer to Figure 1) consists of 22 wind turbines configured as a single row stretching the length of the Mt Cass ridge. The wind farm shares the ridge with four dry pastoral farming operations interspersed with areas of native bush. Formal access to the site is via Mt Cass Road with the wind farm entrance located 2.5 km beyond the turn off to the Kate Valley landfill. Prior to construction (and in emergency situations) there is also access to the ridge via Simmonds Road and farm tracks across Mt Cass Station.

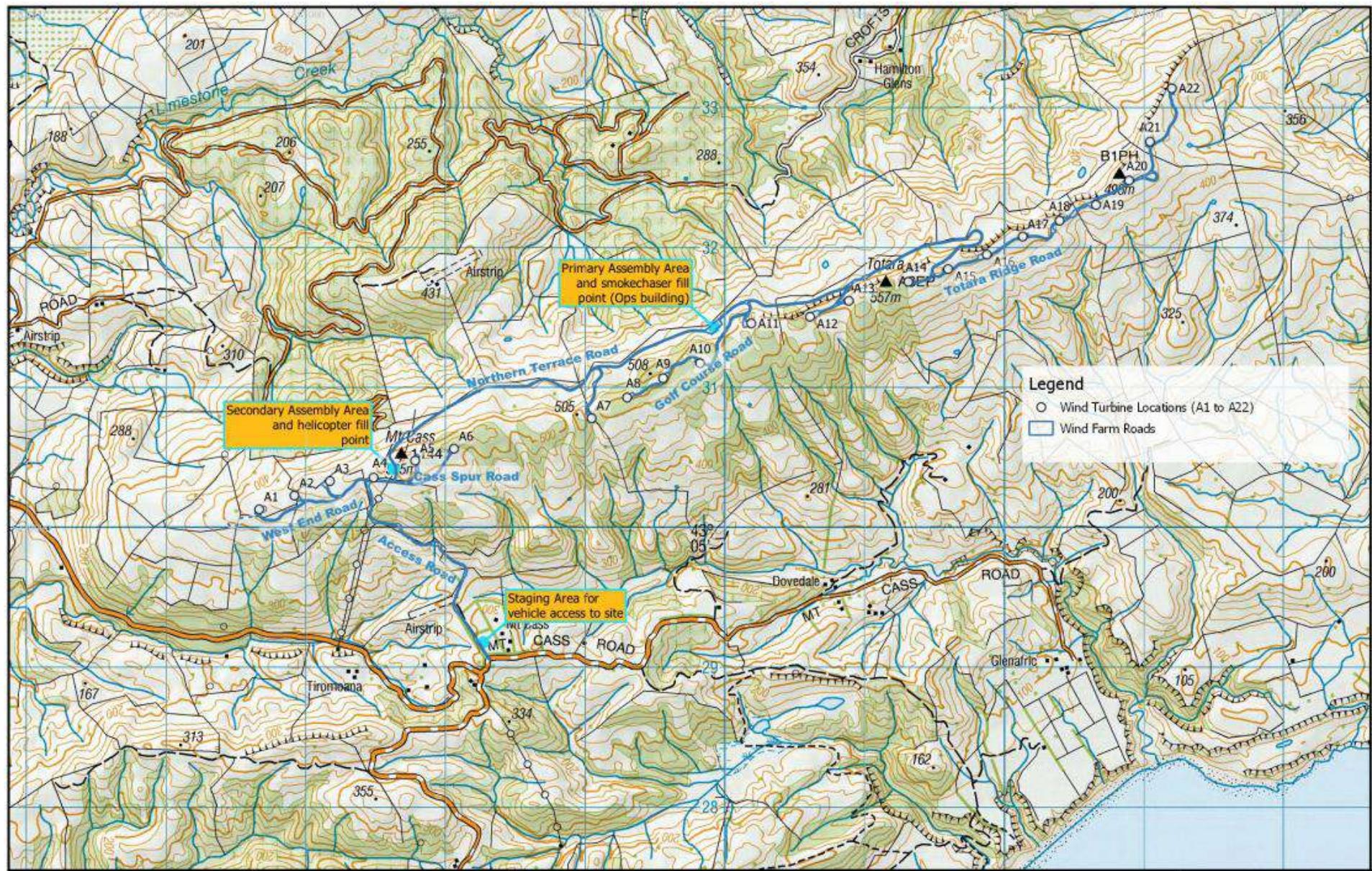


Figure 1 - Site Layout

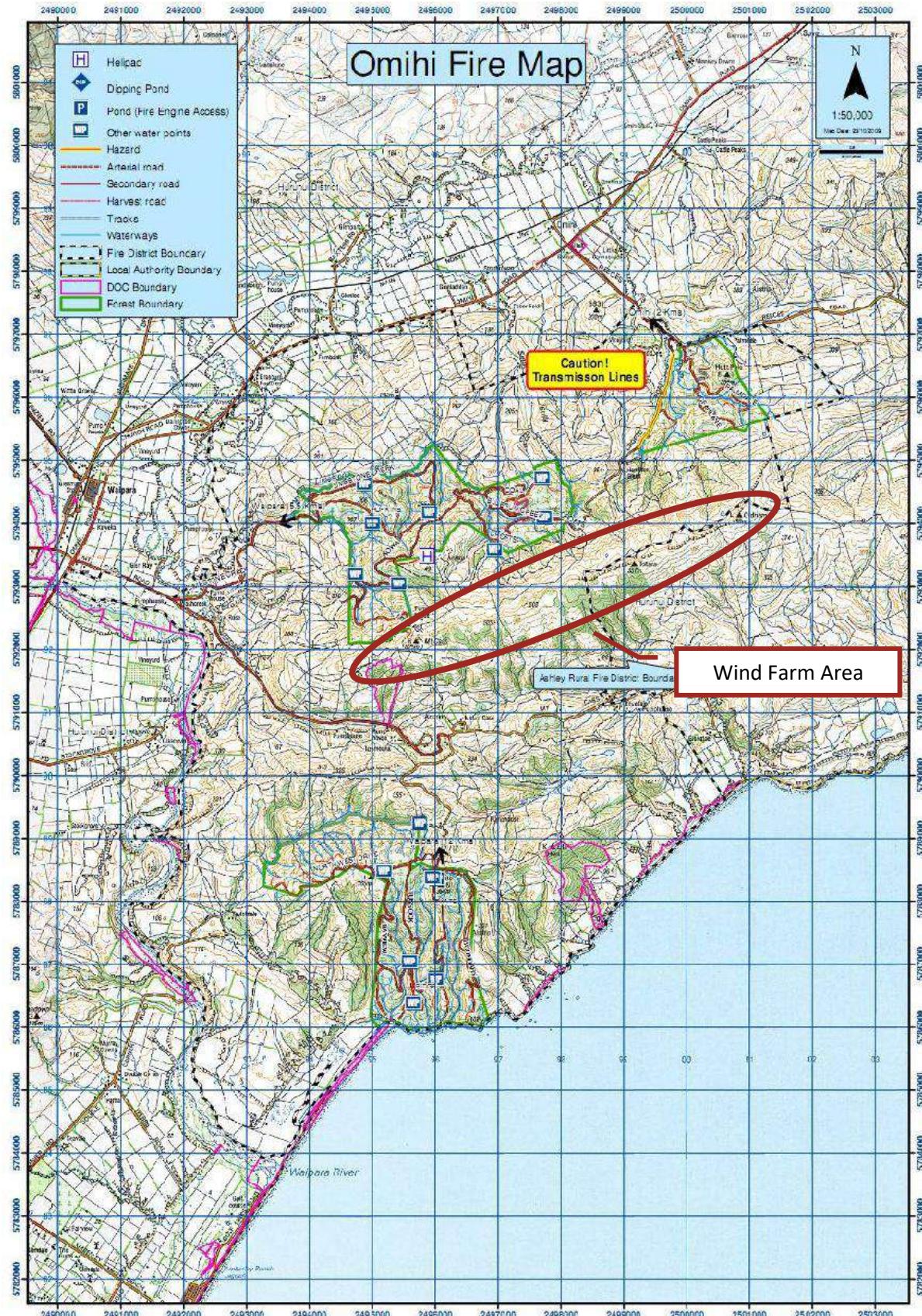
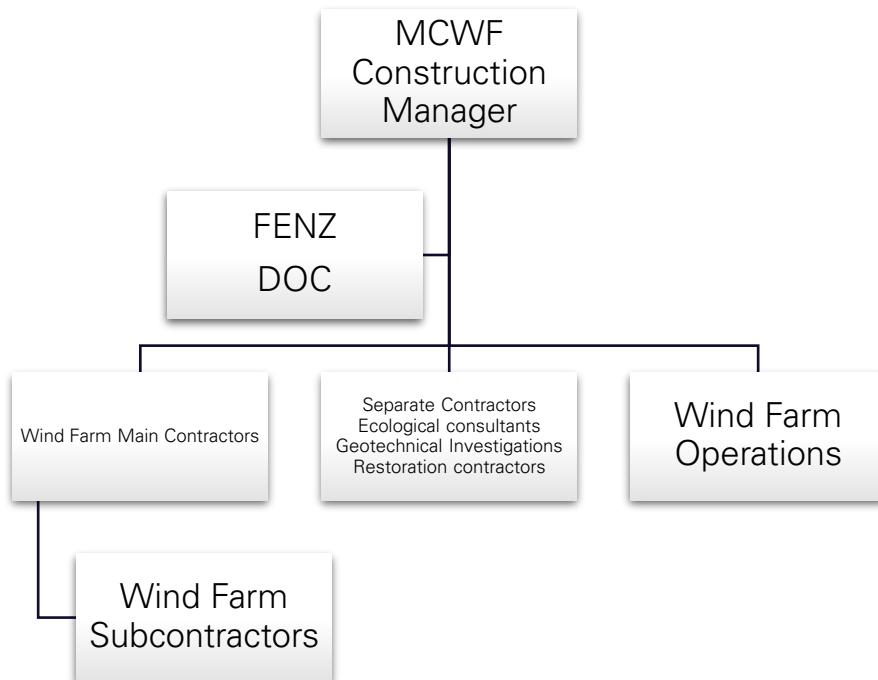


Figure 2 - Larger Site Map showing Fire Services and Water Sources.

2. Fire Management Roles and Responsibilities

The project Fire Management Organisation Chart is shown below



The following responsibilities are specific to Fire.

2.1 MCWF PM Responsibilities

- Has overall responsibility for the Fire Management Plan.
- Ensure that the Fire Management Plan is up to date, reviewed and approved, and available to all personnel on site.
- Issues any revisions of the plan to FENZ.
- Updates the Environmental Management Plan with the latest FMP revision.
- Ensure all consent conditions pertaining to the Fire Management Plan have been achieved.
- Ensures all contractor and subcontractor staff are adequately inducted and trained in site fire control procedures including emergency procedures.
- Undertakes Reviews and Audits of Contractor's related Standard Operating Procedures (SOP's).
- Reports non compliances and arranges appropriate corrective actions.

2.2 FENZ Responsibilities

- Lead agency in the event of a wild fire, will run a Fire outbreak event as an Incident under the Coordinated Management System once notified of a Fire via the 111 system.
- Can support MCWF in other emergency events such as: Structure Fire, Hazardous Spill or Motor Vehicle Accident.
- Coordinates with other agencies in the event of an emergency such as: NZ Police – Fatality or Evacuation, Hurunui District Council – Civil Defence response, DoC – Historic or Biodiversity advice/actions, Land Owners – Operations on site.
- Reviews MCWF Fire Management Plan and associated Emergency Response Plan
- Ensures that local fire response teams have been provided the access and water storage information from site.

- Ensure local response teams are familiar with Mt Cass site.
- Issue Fire Permits as requested.

2.3 Wind Farm Main Contractor Responsibilities

- Develops related SOP's for contract operations and submits for review and approval.
- Ensure they follow all requirements of their FMP and SOP's.

2.4 Wind Farm Sub Contractor Responsibilities

- Develops related SOP's for contract operations and submits for review and approval.
- Ensure they follow all requirements of their FMP and SOP's.

2.5 Separate Contractors Responsibilities

- Develops related SOP's for contract operations and submits for review and approval.
- Ensure they follow all requirements of their FMP and SOP's.

2.6 Operations Contractor Manager Responsibilities

- Ensure they follow all requirements of their FMP and SOP's.

3. Risk Identification

A fire on the wind farm is of significant risk due the potential for high levels of fuel from dry grass, high value vegetation in the area, and risk to personnel and property that a fire in the area would pose. Other fuel sources of significance on site include diesel storage for civil construction and oil storage for transformers.

Potential Ignition sources for a fire include the following:

- Faulty equipment, causing sparks, arcing or open flame
- Hot Works, (Gas Cutting, Angle Grinding, Welding)
- Combustion Engine Equipment (hot exhausts)
- Cigarettes and open cooking flames / BBQ's
- Members of the Public
- Lightning strike

4. Minimisation Procedures General

Due to the nature of works and site, it is impossible to remove all fuel sources, and all potential ignition sources. Key aspects which will minimise the risk of fire include removing as much fuel from the site as possible and separating the works from any remaining fuel as much as practical.

The following plan provides risk mitigation measures for fire, including work processes and emergency readiness.

The Emergency Response Plan will be developed and will be ready for implementation during the Construction Phase in case of fire.

Key site rules include:

- No fires are to be lit or stoves are to be used on site, smoking is not acceptable unless a specific area has been nominated for smoking under a fire safety plan. The construction site will be designated a no-smoking site however vape & e-cigarettes will be permitted in designated areas.
- All vehicles are to be equipped with a fire extinguisher. Spark arrestors will be required for any vehicle (apart from turbo-diesel) which is to go off a formed road.
- Hot works permits are required for all hot works on site.

5. Fire Danger Assessment

The Site Manager will review the Fire Danger information as provided by FENZ and/or Department of Conservation as well as any local information including site specific conditions and assessments by the wind farm landowners or Kate Valley Landfill operators.

Fire Danger assessment for the site can be viewed on the fireweather.niwa.co.nz website for the Salt Water Creek Weather Station of North Canterbury. The fire rating is shown for General, Forestry, Powerline, and Hotworks. Fire seasons can also be viewed on the FENZ website.

Current and forecasted windy weather will be monitored and assessed during all operations involving high likelihood ignition source to fire – works. Works, where practicable will be managed with regard to lowering these risks.

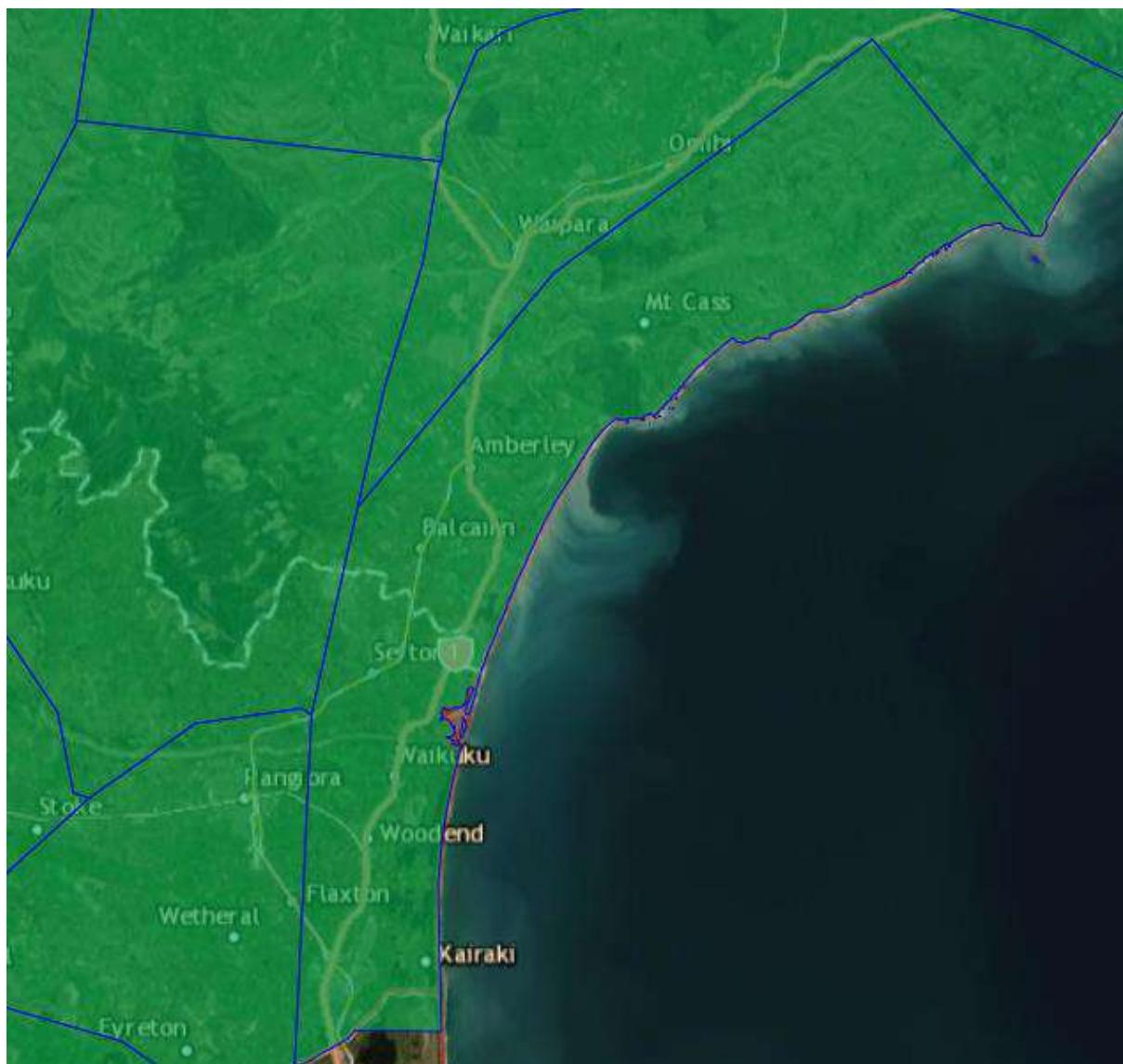


Figure 3 - NZ fire danger class for Salt Water Creek, North Canterbury (Example)

From the status level (as shown in the figure 3 example), and the fire season, the appropriate controls can be put in place as per the controls for each fire level defined in Appendix C.

6. Risk Minimisation Procedures - Detailed Design

6.1 Design Phase Risks

During detailed design of the wind farm there will be limited activity on site and therefore less risk of a fire occurring. However, there will also be less facilities in place, including access roads, so the consequences of a fire may be greater.

6.2 Mitigation

Any design phase activities involving machinery (e.g. geotechnical drilling) should be assessed on a case by case basis and fire safety operating procedures be submitted as part of the contractor's method statement. All contracts are to include provisions for adherence to the latest version of this Fire Management Plan and any relevant SOP's.

There is a requirement under the resource consent to ensure adequate protection is in place prior to undertaking any activities authorised by the consent, including any preliminary geotechnical investigations. Hence any preliminary works will require a SOP, which specifically addresses fire management, approved by the project manager.

The wind farm design, including Turbine selection included consideration of the ability to mitigate fire risk including, track record, transformer type and any active or passive fire detection or suppression systems. A design review for fire risk was undertaken by the design team.

7. Risk Minimisation Procedures - Construction

7.1 Construction Risks

The objective of the construction works will be to complete access routes, platforms, substation and foundations as soon as possible to allow the connecting infrastructure and turbines to be erected and the turbines progressively connected to the network. The likely construction sequence for the site is as follows:

- Site mobilisation, including establishment of temporary site offices, workshops, stores and other facilities;
- Installation of erosion and sedimentation control measures;
- Preparation of initial haulage routes to provide access for construction plant. Haulage routes will follow as close as possible to the proposed alignment of the proposed access roads or may use the existing farm tracks;
- Access road excavation and formation, with cut material transported, placed, and compacted as fill or at disposal sites. Installation of culverts, where appropriate;
- Preparation of laydown areas and the substation platform;
- Installation of internal electrical reticulation along the road;
- Construction of the concrete batching plant site platform and establishment of the batching plant including aggregate stockpile areas, water storage, etc;
- Delivery of concrete aggregates – progressive as concrete demand dictates;
- Construction of substation;
- Construction of overhead transmission line;
- Construction of the turbine access roads and working platforms for turbine foundations and crane set up;
- Excavation for and construction of reinforced concrete turbine foundations (as working platforms are created);
- Cut slope and disposal site rehabilitation progressively behind earthworks;
- Installation of remainder of internal transmission network;
- Delivery and erection of towers, nacelles and rotors;
- Progressive commissioning of turbines; and
- Removal of temporary services and site offices, laydown area rehabilitation and general site reinstatement.

7.2 Mitigation

The following mitigation will take place to minimise the possibility of a fire:

Hot Works

- Hot Works Permit required for all hot works – refer Appendix C for controls to be implemented for hot works.
- Where, and only if possible – Hot Works involving direct spark or flame tasks will be done early morning/late in date, or during foggy days/high humidity. Do not undertake hot work outdoors during prohibited fire seasons unless you have a special permit.
- Hot Works Permits for all high fire risk work with fire permits obtained from FENZ as necessary.
- Wet down the area you are working in and have firefighting equipment handy if the conditions are dry.
- Carry appropriate fire extinguishers, shovels, or knapsack sprayers.
- 30 minutes after you have finished the hot work, do a final check for any hot spots that might cause a fire.

General

- Stop using welders, chainsaws, slashers, and some tractor operations, on extreme fire danger days.
- No Smoking except in locations authorised by the Project Manager.
- No gas cookers on site except in locations authorised by the Project Manager.
- Fire extinguishers in all vehicles and site buildings.
- Vehicle use restricted to formed roads when fire risk exceeds 'High' unless vehicles are equipped to eliminate spark hazard.
- Vehicles that are determined to be suitable for off-road use (i.e. have appropriate spark suppression) are to be recorded in a register and marked with a windscreen sticker.
- Review FENZ information at least daily with records kept for verification if necessary.
- Store petrol, diesel fuels and chemicals in clearly labelled approved containers and in single-purpose locations away from other buildings.

7.3 Maintaining Machinery

- Fire extinguishers in all vehicles
- Check all machinery is free of mechanical defects that could start a fire and has approved exhaust systems and spark arresters.
- Pay special attention to checking your machinery's bearings and moving parts.
- Clean all machinery regularly to ensure belly pans and spaces around motors are free of oil, dust, grease, birds' nests, grass and straw.

7.4 Equipment and Preparation Prior to Works

The following fire equipment is to be onsite for the duration of the construction operation:

- A primary water filling point located just west of Mt Cass peak. This will have 30,000 litres of storage, in addition to that necessary for farm or construction operations. This area will be equipped as a fill point for helicopters.

- A second water point comprising a water tank of at least 10,000 litres will be located at the substation site. This fill point will be suitable for refilling of the 'smoke chaser' units but may not be suitable for helicopters.
- "Smoke chaser" unit (typically a 4WD flatbed truck/ute) equipped with up to 400 litres of water storage a pump and micro-droplet delivery system. The smoke chaser unit will be the primary tool for grass and debris fire suppression should such events occur.
- High Volume filling pump complete with hoses.
- Hand tools including shovels, mattocks and knapsack sprayers.
- Vehicle/machinery fire extinguishers (Mandatory on all site equipment).
- Personal Protective Equipment (PPE)
- Weather recording equipment

For tanker filling requirements the nearest hard-drafting location is in Omihi Stream or the Waipara River (accessed from Mt Cass Road adjacent to the Omihi Stream Bridge). For extended helicopter operations several water points exist in the Omihi Forest block to the north of the ridge.

7.5 Training – On-site Personnel

The following training of on-site personnel will be undertaken prior to the start of fire season:

- Review of all fire prevention / control measures.
- Fire equipment familiarization and operation.
- Emergency Response Plan review and training – refer the emergency response plan.

Fire extinguisher training will be undertaken by plant operators. Other training requirements will be included in emergency response plan.

8. Risk Minimisation Procedures - Operation

Once fully commissioned the wind farm site will change from Construction to its Operational phase. At this point the Site Manager will be the head of Operations and Maintenance. This will include the responsibilities for Fire Management and Incident Control when necessary.

8.1 Fire Suppression Practices and Tools

Grass fires are the most likely fire type to be encountered on the site. Grass fires can move at great speed and are even faster when fanned by the high winds typical across the wind farm. Primary control of grass fires is by ensuring 'fuel loads' are kept to a minimum during Fire Danger periods of "High" or above. This is commonly achieved by maintaining appropriate levels of grazing across the site. Special consideration will need to be given to areas where grazing has been reduced to encourage establishment of woody vegetation, however, these areas are mostly away from the wind farm infrastructure.

Turbine nacelle fires are very rare but may result from brake or electrical failure and could occur during high winds. For fires of this nature, the principal aim is to prevent the fire from spreading (because of burning debris) until it has burnt itself out.

The turbines will be installed with a specific fire detection system where the primary function is to detect and send a response signal to the SCADA system operators & employer in case of fire in the

turbines nacelle and down tower assembly (detected using smoke sensors). This system does not provide fire suppression.

Remote monitoring of the turbines should detect a nacelle fire very early and the Emergency Services shall be notified on 111 if fire is detected.

Regular maintenance of the turbines including lubrication and cleaning of accumulated debris will assist in mitigating the risk of nacelle fire.

8.2 Training – On-site Personnel

Site personnel will be trained in the Fire Management Plan. The Operations Emergency Response Plan will also outline any other training requirements.

9. Emergency Response

The Emergency Response plan will outline the process for all responses in the case of emergencies. The below is the outline of the fire emergency response.

9.1 Standard Immediate Actions

When an emergency occurs, standard immediate actions are used to:

- Raise the alarm
- Ensure the safety of all workers and public nearby as the first priority,
- Assess the situation and decide on a response to the situation

The following is the Standard Immediate Actions in the order that they should be carried out:

- Check your own safety
- Raise the alarm
- Make the area of the emergency safe if possible – put out the fire if possible, never put yourself in harm's way
- Senior person at the scene takes control until someone more qualified turns up on site and takes control.
 - Senior worker accounts for all workers using sign in book and records that this has been done
 - Assesses the situation and decides on course of action, based on Emergency Response Plan including contacting emergency services as required
 - Inform Project Manager
 - Secures the site to ensure that public/media are unable to enter the site area using a physical barrier that is controlled – Site access controller to monitor the cordon and record access/egress
 - Designate a guide for emergency services

9.2 Evacuation Procedures - Immediate site evacuation to muster point

When an alarm is raised, people on the Mt Cass Wind Farm are to assemble in the Primary Assembly Area. If it is unsafe to do so they are to assemble at the Secondary Assembly Area which is shown on the emergency response layout drawing. Once there, a roll call will be carried out by the senior site worker and all workers accounted for.

All resources and expertise available on site are to be made available to FENZ. Personnel on site will comply with directions given by FENZ.

No one will leave site until they have been given direction by FENZ or the Project Manager

No one will re-enter site until FENZ or the Project Manager has approved that it is safe to do so.

10. Plan, Review and Distribution

This plan is an integral part of the Environmental Management Plan (EMP) for the site and the Construction Management Plan for the wind farm. As part of the EMP it is to be publicly available via the MCWF web site and at the Amberley and Christchurch City libraries. All personnel working on the Mt Cass wind farm site will attend a site-specific induction prior to work commencement. At the induction, the fire plan and emergency response plan will be discussed with copies of the evacuation plan distributed.

As detailed in Resource Consent Condition 120, the Fire Management Plan is to be available for viewing by the Consent Authority on request in writing.

Drivers on short term delivery assignments and site visitors will receive a short form induction. During this induction they will be made aware of the fire hazards on site and will be issued with a copy of the evacuation plan. All subcontractor employees and visitors will receive the contractor's briefing on the fire risks at the site. This briefing is to be recorded in an induction checklist.

Members of the public using the walkway to access the site will be made aware of the potential fire danger via noticeboards. When the fire risk is high the walkway will be closed, and the public notified of this via the wind farm web site.

Any reviews to the management plan shall be approved by the Project Manager and distributed to all parties as required.

11. Appendices

Appendix	Description
A	Agencies Available for Assistance
B	Training Matrix
C	NZ Fire Danger Classes & Codes and Recommended Risk Mitigation Measures
D	Hot Works Permit (Sample Only)
E	Fire Suppression Water Storage and Access Road Plan

Appendix A: Agencies Available for Assistance

Fire and Emergency New Zealand	
Direct Contact	Bruce Janes
Role	FENZ PRFO
Email	bruce.janes@fireandemergency.nz
Contact Details	027 278 5052

Department of Conservation	
Direct Contact	Abby Lawrence
Role	Senior Ranger Community
Email	alawrence@doc.govt.nz
Contact Details	027 280 5359

Emergency Contact Details	
Police	111
Fire	111
Ambulance	111
Amberley Volunteer Fire Brigade	http://maps.google.com./?q=21 Markham Street, Amberley, New Zealand 03 314 8600 21 Markham Street, Amberley
Waipara Volunteer Fire Brigade	03 314 6704 94 Glenmark Drive

Appendix B: Training Matrix

	<i>MCWF Construction Manager</i>	<i>Site Manager</i>	<i>Hot Works Spotter</i>	<i>General site staff</i>
All personnel and visitors onto the site will be required to attend an induction when they first arrive on site. Part of this induction will include aspects of the Fire Management Plan. Inductions will also address the smoking policy on site, Hot Work Permits, emergency phone numbers, and aspects of the Emergency Response Plan and the muster area.	✓	✓	✓	✓
Hot works Permit Process and Authorisation	✓	✓	✓	
Safe Operation Training for Water Cart			✓	

Appendix C: NZ Fire Danger Classes, Codes & Recommended Risk Mitigation Measures

Code (Fire Danger Class)	Green (Low)	Blue (Medium)	Yellow (High)	Orange (Very High)	Red (Extreme)
	You can still carry out the work, but you need to be ready with a fire extinguisher, water, a shovel and a radio or working phone to call it in if there is a fire.	You can still carry out the work, but you need to be ready with a fire extinguisher, water, a shovel and a radio or working phone to call it in if there is a fire.	You can still carry out the work, but you need to be ready with a fire extinguisher, water, a shovel and a radio or working phone to call it in if there is a fire.	Schedule your jobs before 10:00am or after 6:00pm	Only essential work should be carried out and only before 10:00am or after 6:00pm
Activity	Mitigation Measures	Mitigation Measures	Mitigation Measures	Mitigation Measures	Mitigation Measures
Welding/gas cutting/abrasive wheel cutting	<ul style="list-style-type: none"> Work only on bare earth Have a fire extinguisher/minimum of 20 litres of water, along with an appropriate method of applying that water, within 5 metres of the work area Patrol for 30 minutes after completion 	<ul style="list-style-type: none"> Work only on bare earth Have a fire extinguisher/minimum of 20 litres of water, along with an appropriate method of applying that water, within 5 metres of the work area Patrol for 30 minutes after completion 	<ul style="list-style-type: none"> No Hot Work unless on a 20 metre radius of bare ground Have a fire extinguisher/minimum of 20 litres of water, along with an appropriate method of applying that water, within 5 metres of the work area Patrol for 30 minutes after completion 	<ul style="list-style-type: none"> No Hot Work unless on a 20 metre radius of bare ground Have a fire extinguisher/minimum of 20 litres of water, along with an appropriate method of applying that water, within 5 metres of the work area Patrol for 30 minutes after completion 	<ul style="list-style-type: none"> Consider stopping all Hot Works for a defined period unless a smoke chaser plus crew can be located nearby, OR Work before 1000 hours and after 1600 hours; OR wet the area before and after the Hot Works; maintain 1000 litres of water plus pump on site for two hours following the final wet-down Maintain observation presence for two hours afterwards
Inspections & maintenance requirements		<ul style="list-style-type: none"> Check machinery for debris build up near hot working parts such as belly pans and radiators Check engine bay hydraulic hoses for leaks 	<ul style="list-style-type: none"> Check machinery for debris build up near hot working parts such as belly pans and radiators Check engine bay hydraulic hoses for leaks 	<ul style="list-style-type: none"> Daily - Assess daily weather at 1300 hours by forest to determine need for elevation of readiness level Weekly - Inspection of all fire equipment (including extinguishers) - Regular cleaning for all machinery 	<ul style="list-style-type: none"> Daily - Assess daily weather at 1300 hours by forest to determine need for elevation of readiness level Weekly Inspection of all fire equipment (including extinguishers) Regular cleaning for all machinery
Fire starts		Notify 111 of any fire start regardless of size	Notify 111 of any fire start regardless of size	Notify 111 of any fire start regardless of size	Notify 111 of any fire start regardless of size
Emergency planning		<ul style="list-style-type: none"> Notify FENZ of any road closures or weekend work Inform the workforce about Code Blue requirements and preparation for future elevation to Code Yellow at, for example, tailgate meetings 	<ul style="list-style-type: none"> Notify FENZ of any road closures or weekend work Inform the workforce at tailgate meetings about Code Yellow requirements. Escape plans: Consider covering in tailgate meetings 	<ul style="list-style-type: none"> Inform the workforce about Code Orange requirements and preparation for future elevation to Code Red at tailgate meetings Consider covering in tailgate meetings: Escape plans, initial response actions Identify suitable water points (for ground and helicopter) around work areas and maintain as appropriate 	<ul style="list-style-type: none"> Inform the workforce about Code Red requirements at tailgate meetings Consider covering in tailgate meetings: Escape plans, initial response actions Identify suitable water points (for ground and helicopter) around work areas and maintain as appropriate Patrol sites for at least one hour after machine shutdown Consider having a 3-person quick response crew with smoke chaser based at a central location. Liaise with FENZ to determine FENZ initial response plans in case of fire
Machines				<ul style="list-style-type: none"> Vehicle use restricted to formed roads when fire risk exceeds 'High' unless vehicles are equipped to eliminate spark hazard 	<ul style="list-style-type: none"> Vehicle use restricted to formed roads when fire risk exceeds 'High' unless vehicles are equipped to eliminate spark hazard

Appendix D: Hot Works Permit (SAMPLE ONLY)

1	Project Name: _____					Date: _____ / _____ / _____
2	Fire Hazard Level	Green (Low)	Blue (Medium)	Yellow (High)	Orange (Very High)	Red (Extreme)
3	SCOPE OF HOT WORK: (define as clearly as possible)					
NO HOT WORK OUTSIDE THIS SCOPE MAY BE PERFORMED UNDER THIS PERMIT						
4	POTENTIAL IGNITION SOURCES: (Tick as required)					
<input type="checkbox"/> Thermal Cutting <input type="checkbox"/> Grinding <input type="checkbox"/> Abrasive Blasting <input type="checkbox"/> Welding <input type="checkbox"/> Electric Arc Of Any Type <input type="checkbox"/> Electric Tools <input type="checkbox"/> Drilling <input type="checkbox"/> Radiography <input type="checkbox"/> Impact Tools <input type="checkbox"/> Combustion Engine <input type="checkbox"/> Non Intrinsically Safe Equipment <input type="checkbox"/> Other 						
5	POTENTIAL FUEL SOURCES: (Tick as required)					
<input type="checkbox"/> Fuel Oil (liquid) <input type="checkbox"/> Lubricating Oil (liquid) <input type="checkbox"/> Timber <input type="checkbox"/> Vegetation / Grass <input type="checkbox"/> Plastics <input type="checkbox"/> Fuel Oil (vapour) <input type="checkbox"/> Lubricating Oil (vapour) <input type="checkbox"/> Paper <input type="checkbox"/> Chemicals <input type="checkbox"/> Electrical Cables <input type="checkbox"/> Gas <input type="checkbox"/> Nil <input type="checkbox"/> Other 						
6	HOT WORK CHECKLIST: (Tick as required the precautions taken, refer NZ Fire Danger Classes & Codes and Recommended Risk Mitigation Measures)					
<input type="checkbox"/> No Hot Work unless on a 20 metre radius of bare ground <input type="checkbox"/> Have a fire extinguisher/minimum of 20 litres of water, along with an appropriate method of applying that water, within 5 metres of the work area <input type="checkbox"/> Work area swept and wetted down <input type="checkbox"/> Water hose rolled out and left running <input type="checkbox"/> Appropriate fire extinguisher ready for use <input type="checkbox"/> Means of escape identified and available <input type="checkbox"/> Isolations on Associated Permit adequate <input type="checkbox"/> Patrol for 30 minutes after completion						
7	SPECIFIC PRECAUTIONS TO BE TAKEN DURING THIS HOT WORK: (Tick as required)					
<input type="checkbox"/> Ventilation <input type="checkbox"/> Fire Watch Required <input type="checkbox"/> Barricades/Signage <input type="checkbox"/> Sparks To Be Contained <input type="checkbox"/> Extraction <input type="checkbox"/> Respiratory Protection <input type="checkbox"/> Inert Gas Purge To Be Maintained						
OTHER PRECAUTIONS: (include any special PPE).....						

8

PERMIT ISSUE: All precautions in section 5 have been made to ensure the safety of those working under this permit. All the conditions on this permit have been discussed with the permit acceptor & I authorise work to proceed. **All hot work permits are Valid for 1 Day.**

Authorised Issuer: Signature:

9

PERMIT ACCEPTANCE: All Work Crew members involved in the hot work confirms & accepts that conditions stated in this work permit & any associated procedures will be strictly adhered to & all persons are aware of all conditions relating to the scope of the hot work.

Name: Signature: Name: Signature:

Name: Signature: Name: Signature:

Name: Signature: Name: Signature:

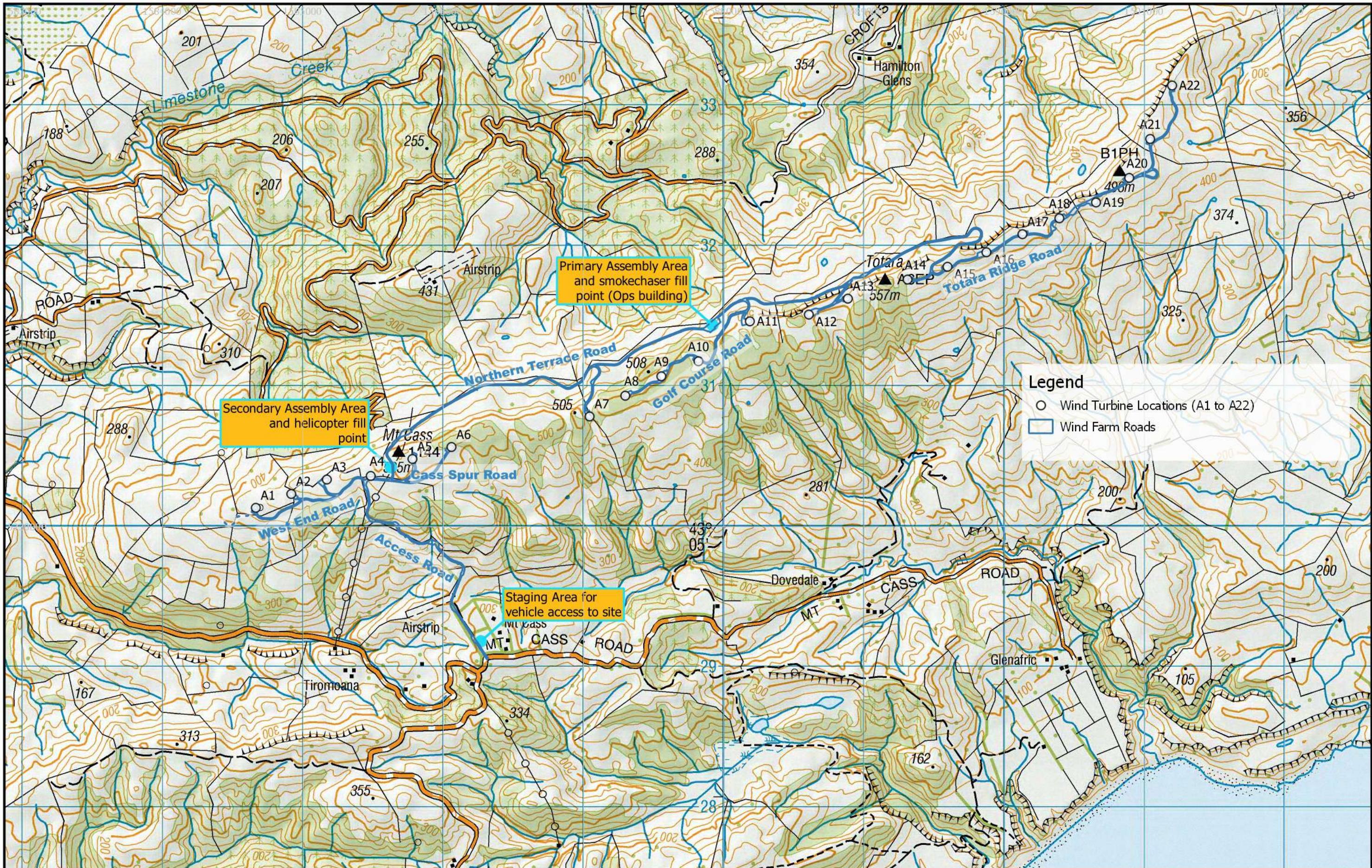
10

PERMIT CLOSURE: Accepts and confirms completion as above and verifies permit has been returned and signed off by Acceptor. Precautions recorded in section 5 have been removed and the area has been inspected and left in a safe condition.

Site has been Patrol for 30 minutes after completion

Authorised Issuer: Signature:

Appendix E: Fire Suppression Water Storage & Access Road Plan



Background map: NZ Topo50
Sourced from the LINZ Data Service and licensed for re-use under the Creative Commons Attribution 4.0 International License.

MT CASS WIND FARM

Features for Fire Management

Drawn: AJH 27 Oct 2020

Scale (at A3) 1:25 000

Drag 4768 - Sheet 1 of 1

Appendix K

B8 Weed Management Plan



Mt Cass Wind Farm

Weed Management Plan



Revision 5 – 23 March 2023

This document has been prepared for the benefit of Mt Cass Wind Farm Ltd (MCWF). No liability is accepted by this company or any employee or sub-consultant of this company with respect to its use by any other person. This disclaimer shall apply notwithstanding that the report may be made available to other persons of an application for permission or approval to fulfil a legal requirement.

Revision History

Version	Description	Date	Prepared by	Approved By
Rev 1	Draft	03 Mar 21	HW	SB
Rev 2	Draft	19 Apr 21	HL	SB
Rev 3	MCD Input	1 Dec 22	DK	AH
Rev 4	MCD Updates after review	23 Feb 23	DK	MC
Rev 5	Post CLG review and issue to HDC	23 Mar 23	MC	GG

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1. Introduction

1.1 Purpose

This plan aims to inform people involved in the Mt Cass Wind Farm construction (the Project) how to control Weeds and comply with the resource consent requirements and any other regulatory requirements during the construction works. The plan covers the construction of the wind farm.

Construction of the Project represents a real risk for weed spread as seeds are readily dispersed on the vehicles entering the site or by wind and birds and can establish and grow quickly on disturbed sites associated with wind farm development (e.g. road cuts).

1.2 Overview

The Weed Management Plan is the primary responsibility of the Project Director and begins with hazard awareness and risk minimisation. This plan sets out Weed Management risks and associated Management Processes to mitigate the identified Project Risks.

During construction, each Contractor will be responsible for ensuring that this plan is correctly implemented and will review all documentation relating to this plan before it is finalised and issued.

Site induction for all personnel must include a briefing on this plan, including the main content of this plan and any SOPs relevant to the task being performed.

This plan will be read in conjunction with the MCWFL Construction Management Plan and their Environmental Management Plan.

2. Consent Conditions

Appendix C of the Construction Management Plan includes a matrix of all consent conditions included in the Construction Management Plan and Sub plans. The following are the specific conditions that pertain to this plan:

Consent Conditions	Control for Consent Conditions
Construction Management Plan	
31) The objective of the Construction Management Plan shall be to set out the practices and procedures to be adopted to ensure compliance with consent conditions and to meet the following objectives:	
n. To minimise the introduction and spread of weeds.	Refer Section 3.2 of this plan
32) The Construction Management Plan shall include, but not be limited to	
m. Procedures for the management of weeds.	Refer to Section 3.2 of this plan
Environmental Management Plan	
84) The weed monitoring and control section of the Environmental Management Plan shall include, but not limited to:	
b. The details of measures to minimise the effects and introduction of weeds that shall include, but not be limited to: ii. Ensuring construction vehicles are cleaned of adhering soil before first entering the project site, and that weed-free sources of aggregate are used;	Addressed in Section 5.5 of the EMP and Section 3.2 of this plan.

3. Existing Project Site Conditions

Several vegetation surveys have been completed during the pre-construction phases of the Project as part of the resource consent applications and the baseline inventory of weeds. The weed species identified during these surveys and the relative abundance based on the ACFOR index (Abundant, Common, Frequent, Occasional, Rare) and photographic examples of the weeds are provided in Appendix A.

Invasive weed species that are known to cause problems in similar environments and threaten biodiversity values at the site or in the general vicinity are listed in Table 1.

Table 1 Invasive species that pose a threat to biodiversity at the Project site

Weed example photo	Species	Common name
	Pinus sp.	Wilding Pines
	Cytisus scoparius	European broom
	Ulex europaeus	Gorse

Weed example photo	Species	Common name
	<i>Crataegus monogyna</i>	Hawthorn
	<i>Berberis glaucocarpa</i>	Barberry
	<i>Rosa Rubiginosa</i>	Sweet Briar
	<i>Sambucus nigra</i>	Elderberry

Weed example photo	Species	Common name
	<i>Prunus avium</i> , <i>Prunus</i> SP.	Wild Cherry
	<i>Nassella trichotoma</i>	Nassella Tussock
	<i>Clematis vitalba</i>	Old Man's Beard
	<i>Arctium Minus</i>	Burdock

Weed example photo	Species	Common name
	<i>Crataegus Monogyna</i>	Hawthorn
	<i>Dryopteris filix-mas</i>	Male Fern
	<i>Polypodium Vulgare</i>	Common Polypody
	<i>Centranthus ruber</i> subsp. <i>ruber</i>	Spur valerian

Weed example photo	Species	Common name
 Photo: Carolyn Lewis	<i>Cotyledon orbiculata</i>	Pig's ear
	<i>Sedum acre</i>	Stonecrop

Photos source: <https://www.weedbusters.org.nz/what-are-weeds/weed-list>

Control Measures

3.1 Key Principles and Approaches

The key principle for weed management during the Projects construction is to ensure that additional weed species are not introduced to the site and that any existing weed species are managed to avoid the spread of invasive species as a result of construction activities.

Documents relevant to weed management at the Project site include:

- Environment Canterbury Regional Pest Management Plan (2018-2038)
- Environment Canterbury Regional Pest Management Strategy
- Mt Cass Wind Farm Environmental Management Plan
- Mt Cass Wind Farm Pest Plant Guide (Rev 7- September 2021)
- Keep it clean - Machinery hygiene guidelines and logbook to prevent the spread of pest weeds.

3.2 Specific Weed Control Measures

The following measures will be implemented to minimise the effects, and the introduction of weeds shall include, but not be limited to:

- Earth-engaging machinery will be appropriately cleaned off-site of any adhering soil before entering the site.
- A pre-use inspection will be carried out before the specific machine is operated on the site. This inspection requires that the machinery is clean and dirt and vegetation free. A draft template is in Appendix B
- All earth-engaging machinery movements to and from the site will be logged in a register to allow tracking of plant movements.
- Weed-free sources of aggregate and dust-suppression water will be used.
 - Amberley Beach Rd Quarry
 - Miners Road Quarry (Christchurch)
 - Amberly potable water supply.
- All sites disturbed during wind farm construction will be rehabilitated with vegetation appropriate to the location of the site within 12 months of the sites being no longer required for construction (and preferably more rapidly if seasonal conditions permit) to establish a vigorous plant growth that will reduce opportunities for weed species to establish.
- MCWFL's ecologist will conduct regular site inspections, checking for pest weed outbreaks.

3.3 Weed Out Break Control Measures

The civil constructor will be responsible for controlling any high-level weed infestation that may arise because of wind farm construction. This will benefit from having more significant resources to bring to the issue. Any weed control for high infestation levels will still be subject to the same ecological controls required for routine weed surveillance.

4. Training – On-site Personnel

Site personnel will undertake a site induction, so they are aware of the project consent conditions. They will also be trained in weed control as required to comply with the requirements of this plan. Construction personnel will be briefed on the biodiversity status of the site, the requirements of the WMP and the importance of weed hygiene in maintaining the site's quality.

5. Monitoring During Construction

Monthly site audits will be carried out by the project environmental advisor and MCWFL Project engineers to ensure compliance with this management plan.

Monitoring shall occur for the entire duration of the work. Any control measures requiring maintenance or adaptation to allow construction tasks to occur shall be identified and implemented by the Environmental Manager to ensure continual compliance. The following monitoring is required concerning weed management:

Annual monitoring of all areas disturbed by the wind farm will be undertaken to detect and remove any ecologically important weed species that might establish. This monitoring would be undertaken by the consent holders' ecologists and involve traversing the wind farm roads and turbine sites to search for any ecologically important weeds that might be present. Any weed locations will be recorded, and the plant(s) will be removed at the time if at all possible. If not, arrangements will be made with the relevant Contractor to plan removal.

6. Appendices

Appendix	Description
A	Identified weed species
B	Plant inspection sheet.

APPENDIX A – Identified Weed Species

2 Ecologically Important Invasive Weeds

2.1 Burdock (*Arctium minus*)

What does it look like? Upright, open- branched, shrubby perennial <1.5m tall. Rosette form in first year. Large, hollow leaves stalked, triangular, <40cm long, green sparsely haired on topside, white & densely haired underneath. Hairy stems. Pink, egg-shaped, thistle-like flowerhead (Jan-Apr) surrounded by hooks.

Are there any similar species? No similar species occur on site.

Why is it weedy? Well-dispersed seeds that hook onto clothes, wool & fur.

What damage does it do? Grows in similar environments to the Threatened limestone wheat grass (*Australopyrum calcis subsp. Optatum*), and threatens this species through competition. Causes animal welfare issues, with burs damaging sheep wool and injuring skin, mouth or eyes.

Which habitats is it likely to invade? Forest margins, scrub, roadsides waste areas. Prefers wet areas and tolerates shade.



[Plate 1] Image source Auckland Council.

2.2 Barberry (*Berberis glaucocarpa*)

What does it look like? Evergreen or semi-deciduous, spiny, yellow-wooded shrub (<4-5 m). Tough, woody stems have yellowish-grey bark and very sharp, hard, single or three pronged spines (<23 mm long) where the leaves meet the stem. Leathery leaves (25-75 x 10-25 mm) with usually serrated edges often turn reddish in autumn. Clusters (<6 cm long) of smelly yellow flowers (5-7 mm, Oct-Nov) are followed by oval, reddish-black berries (7-12 mm) with a dusty white look to them and dark red juice (Mar-May).

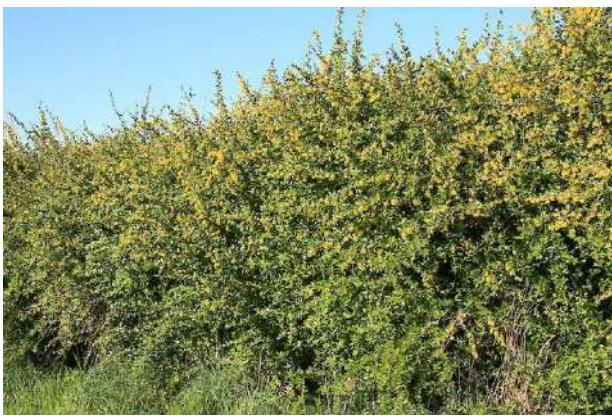
Are there any similar species? No similar species occur on site.

Why is it weedy? Long-lived and produces long-lived, well-dispersed seeds. Tolerates hot to cool temperatures, damp to dry conditions, high wind, salt, little shade, damage (not grazed) and many soil types.

Variable production of viable seed, from large amounts to none. Birds and possibly possums eat berries and spread the seeds, which are also spread by soil and water movement. Seed sources include farm hedges, roadsides, old homesteads, and plantation forest.

What damage does it do? Scattered plants (occasionally dense stands), replace native species.

Which habitats is it likely to invade? Disturbed forest and shrubland, short tussockland, and bare and stony land.



[Plate 2] Image source weedbusters.org.nz

2.3 Old Man's beard (*Clematis vitalba*)

What does it look like? Deciduous, climbing, layering vine (<20 m tall) with very long, woody stems with six prominent ribs (appear as furrows in older vines) and pale, easily rubbed-off bark. Leaves are arranged in opposite pairs on the stems and are made up of five (rarely three) widely spaced leaflets that fall in autumn. Thin, papery leaflets are sparsely hairy and have bluntly toothed or smooth edges. Creamy white, fragrant flowers (2-3 cm diameter, Dec-May) are followed by grey, hairy seeds (2-3 mm long) with distinctive white plumes (3-4 cm long) in dense, fluffy clusters persisting over winter (hence the 'old man's beard').

Are there any similar species? All native clematis species are evergreen, have 3 leaflets (except the leafless *C. afoliata*), unfurrowed stems, and flower from August to December. All exotic species that are found in the wild are deciduous (flowers Dec-May), except the occasionally weedy, pink-flowered *C. montana* (flowers Oct-Dec).

Why is it weedy? Grows rapidly, forming dense, heavy, masses that dominate canopy of any height. Stems layer profusely, and it produces many long-lived seeds if exposed to frost. Tolerant of cold, moderate shade, damp, wind, salt, most soil types, and damage.

How does it spread? Seed is spread by water or wind, and both seed and stem fragments are spread in dumped vegetation. Common sources are forests, roadsides, hedgerows, vacant land, and willow swamps.

What damage does it do? Smothers and kills all plants to the highest canopy and prevents the establishment of native plant seedlings. Moves readily into established forest over canopy and by layering.

Which habitats is it likely to invade? Disturbed and open forest and forest margins, shrublands, cliffs, bush tracks, fernland, and tussockland.



[Plate 3] Image source weedbusters.org.nz

2.4 Hawthorn (*Crataegus monogyna*)

What does it look like? Deciduous shrub or small tree (<10 m tall) with much-branched stems that are hairless, reddish-brown when young, but become grey when mature and have stiff spines to 12 mm long. Hairless triangular leaves (35-50 x 35-45 mm) with 3-7 deep lobes are solitary on long shoots, clustered on short shoots, and are often chewed by slugs. Dense flat clusters of 6-15 sweet-scented, white (rarely reddish-pink), 5-petalled flowers (10-15 mm diameter, Oct-Nov) are followed by round, shiny, crimson berries (7-11 mm diameter, Dec-Apr) with little flesh around a single stone.

Are there any similar species? Other cultivars, especially *Crataegus laevigata* (usually grown as pink, double flowered cultivars), barberry and boxthorn are similar.

Why is it weedy? Produces many long-lived, well dispersed seeds, is extremely tough and versatile, long-lived, tolerates hot to cold temperatures, damp to dry conditions, salt, wind, heavy damage, most soils, and semi-shade.

How does it spread? Birds, and occasionally soil and water movement. Hedges, poor pastures, roadsides, and waste places are all seed sources.

What damage does it do? Crowds out most other species, forms dense (occasionally pure) thickets, preventing the establishment of native plant seedlings.

Which habitats is it likely to invade? Disturbed forest, shrubland and margins, fernland, wetland margins, short tussockland, other low-growing habitats, and cliffs.



[Plate 4] Image source weedbusters.org.nz

2.5 Broom (*Cytisus scoparius*)

What does it look like? Erect, much branched, almost leafless, deciduous shrub (<2.5 m) with a woody rootstock. Silky-hairy young twigs mature into woody, flexible green stems that are 5-ribbed and hairless. Leaves are divided into three sections (each 5-20 mm) that readily fall off the stems. Single or paired, golden-yellow (occasionally reddish), pea-like flowers (15-25mm, Sep-Apr) are followed by oblong green pods (30-60 mm) that turn black as they mature and eventually disperse seeds explosively, leaving empty coils hanging from the plant.

Are there any similar species? Montpellier, Spanish and white broom. Tree lucerne, *Teline stenopetala*, and native *Carmichaelia* species are all similar.

Why is it weedy? Prolific seeder that spreads rapidly, matures quickly, and colonises large areas, forming pure stands that dominate habitats. As it is a legume and can fix nitrogen in the soil, it can change the types of plants which can survive where it has been growing, disturbing the ecology of an area. Particular problem on riverbanks and lakesides, roadsides, forest tracks and firebreak areas. Tolerates warm to very cold temperatures, most well drained soil types, grazing, fire, and high to low rainfall.

How does it spread? Explosive seed mechanism spreads seed 1-5 m from the parent plant, and they are also spread by machinery, soil and water movement, and possibly birds and feral pigs. Common seed sources include quarries, roadsides, forest tracks, metal dumps, fire breaks, exotic forests, skid sites, riverbeds, domestic gardens, and disturbed land.

What damage does it do? Forms pure stands in many habitat types. Dominates low canopy habitats, preventing the seedlings of native species from establishing. Increased nitrogen in gumlands and other impoverished soil types may result in changing habitats and plant species being present to the detriment of specialised plants e.g. orchids, ferns, herbs, kauri, or can lead to further weed invasion.

Which habitats is it likely to invade? Shrublands, forest margins, low canopy habitats, tussockland, fernland, wetland, regenerating and disturbed forest, and bare land.



[Plate 5] Image source weedbusters.org.nz

2.6 Male fern (*Dryopteris filix-mas*)

What does it look like? Stout rhizomatous fern. Laminae bipinnate up to 125 x 30 cm, dark green above, paler green below. Primary pinnae in 25-50 pairs, secondary pinnae in 15-30 pairs. Sori round, 1-5 pairs on each secondary pinnae.

Are there any similar species? Dryopteris is closely related to Polystichum and Lastreopsis, but distinguished from Polystichum by the kidney-shaped indusia, and from Lastreopsis by its abundance of stipe-scales and absence of hairs.

Why is it weedy? It outcompetes native ferns.

Which habitats is it likely to invade? Male fern is found in diverse habitats with a preference for sheltered sites with more southerly than northerly aspects. Male fern is mostly associated with stream sides, degraded sites and sites of past disturbance.



[Plate 6] Image source nzpcn.org.nz

2.7 *Nassella tussock* (*Nassella trichotoma*)

What does it look like? Perennial tussock grass with erect or drooping leaves, which grows up to 70 cm high and 80cm wide and forms dense clumps. Stem is swollen just above ground level – like a shallot. Light green or yellowish-green leaves are thin and tightly rolled; they do not break when pulled. When fingers are run down the leaf, they feel needle-like and very tough. Leaf sheaths are white to light brown. Ligule is short (1 – 2 mm), white, hairless and obvious when the blade is pulled from a younger leaf. Plants usually flower between October and early summer when they have a purplish tinge. Flowering stems can be up to 1 m tall. Flowerheads are open, with a branched seed head 25 – 95 cm long and produced between November and January. Ripe seeds are purplish with a 3cm long bristle. Roots are deep, matted and fibrous. They have been found growing 1.7 m below the soil surface.

Are there any similar species? Other similar looking tussocks have purplish colouration at their leaf bases. Similar looking tussocks have no ligule (a thin outgrowth at the junction of leaf and leafstalk) or a ligule with hairs.

Why is it weedy? *Nassella tussock* can be seriously invasive, completely dominating low-producing grassland. Prevalent in North Canterbury and Marlborough, where it can form dense stands which are difficult to manage.

How does it spread? Seeds are spread by the wind and can travel as far as 16 km. Seeds are also transferred to other properties by livestock, machinery, clothing and on milled plantation logs.

What damage does it do? Pasture carrying capacity can be significantly reduced because the leaves are unpalatable and indigestible.

Which habitats is it likely to invade? Grows well on steep, dry, rugged sunny slopes, ridges and knobs. Establishes well on overgrazed, dry bare land.



[Plate 7] Image source agpest.co.nz

2.8 Wilding pines (*Pinus sp.*)

What does it look like? Wilding pines are sourced from a number of species. Typically, resinous, evergreen trees <25m tall. Bark rough & often fissured. Bunches of green, needle-like leaves. Cones produced with many seeds.

Are there any similar species? No, a distinctive family with bunches of green, needle-like leaves.

Why is it weedy? Pines can dominate and exclude other vegetation. The older trees become canopy trees in forest.

How does it spread? Seeds are spread by the wind and can travel as far as 50 km.

What damage does it do? They change soil acidity, precluding some native species, and can dominate the landscape.

Which habitats is it likely to invade? Open places, coastal areas, slopes, shrubland. Common near plantations & shelterbelts.



[Plate 8] Image source Auckland Council

2.9 Common polypody (*Polypodium vulgare*)

What does it look like? The common polypody is a fern developing in isolation from along a horizontal rhizome. The fronds with triangular leaflets measure 10 to 50 centimetres (3.9 to 19.7 in). They are divided all the way back to the central stem in 10 to 18 pairs of segments or leaflets. The leaflets become much shorter at the end of the frond. The leaflets are generally whole or slightly denticulated and somewhat wider at their base, where they often touch each other. They have an alternating arrangement, those on one side being slightly offset from those on the other side. The petioles have no scales.

The sori are found on the lower side of the fronds and range in colour from bright yellow to orange. They become dark grey at maturity.

Are there any similar species? No other similar species on site.

Why is it weedy? It outcompetes native ferns.

Which habitats is it likely to invade? This fern is found in shaded and semi-shaded locations. It is a lithophyte (grows on rocks), and is found growing in the moss on cliffs, cracks in rocks, and in rocky undergrowth; also as an epiphyte on mossy trees.



[Plate 9] Image source nzpcn.org.nz

2.10 Wild cherry (*Prunus avium*, *Prunus sp.*)

What does it look like? Deciduous, spreading, suckering tree (<5-12m tall) with tall trunk. Thin, oval leaves (30-150 x 25-70 mm) with toothed edges are hairless above, and undersides are hairy when leaves are young, becoming hairless as they mature. White, occasionally double, flowers (11-19 x 8-17 mm) aren't fragrant, and are in clusters of 2-4 (Sept-Nov). Cherry fruit (8-17 mm diameter, 30 mm in cultivation) develops Nov-Feb, is dark red, usually sweet but can be bitter.

Are there any similar species? Other cherry (*Prunus*) species, especially *P. campanulata*, *P. serrulata*, *P. laurocerasus*, *P. lusitanica*.

Why is it weedy? Tolerant of cold, low rainfall, mod shade. Suckers, long-lived, forms dense stands, tall. Seeds long-lived, widely dispersed.

How does it spread? Birds carry seed medium distances, and suckers locally. Soil movement.

What damage does it do? Impacts on native plants. Forms dense stands in open and disturbed habitats, prevents native plant germination and growth.

Which habitats is it likely to invade? Disturbed forest and shrubland.



[Plate 8] Image source weedbusters.org.nz

2.11 Sweet briar (*Rosa rubiginosa*)

What does it look like? Deciduous, erect, occasionally dense, woody shrub to 3 m (occasionally 5 m) tall with stout branched roots that often sucker. Many arching stems grow from the base, with few to many, unequal, flattened, downward-pointing, curved thorns. Apple-smelling leaves are hairless dull green above, hairy below, and divided into 5-9 narrow-oval leaflets (12-40 x 8-28 mm). Clusters of 1-3 pink (or bright pink with whitish base) rose-like, 5-petalled flowers (25-40 mm diameter) appear from November to January, followed by prominent, egg-shaped, shiny red or orange-red rose hips (12-22 x 10-18 mm) from February to May.

Are there any similar species? Dog rose (*Rosa canina*) has even-sized thorns and is also weedy, especially in damp areas.

Why is it weedy? Long-lived seed is occasionally well dispersed and spread is also by suckers. Tolerates drought, hot to very cold temperatures, wind, low fertility, most well-drained soils and damage (little grazed). Can dominate the canopy.

How does it spread? Mostly via suckers and also by bird-dispersed seed. Abandoned gardens, poor and drought-prone pasture, roadsides, and river flats are all common sources.

What damage does it do? Forms dense, long-lived stands in tough, open habitats, inhibiting or preventing the seedlings of native species from establishing. Can alter riverbeds, causing flooding. Requires moderate to high light levels, and invades only open sites or badly degraded forest.

Which habitats is it likely to invade? Tall and short tussockland, shrubland, stabilised scree, steep open slopes, well drained sites, dunes, and bare land, mainly in drier eastern areas.



[Plate 9] Image source weedbusters.org.nz

2.12 Elderberry (*Sambucus nigra*)

What does it look like? Deciduous shrub or small tree (<6 m tall). Stems are grey-fawn with white pith and many small and corky lumps (glands). Leaves comprise of 5-7 leaflets that are purple when very young, becoming green. Leaflet at the tip is broadly oval (4.5-11 cm long, 3.5-6 cm wide), hairless or hairy on veins beneath and on midrib above, serrated except towards base, and has a pointed tip. Other leaflets are smaller and narrower. Flowers and fruit form in a flat umbrella-shaped cluster (10-20 cm diameter). Dull white, pungent flowers (2-3 mm long, Nov-Jan) are on stalks that usually turn red-purple when fruit develop. Berry-like, round fruits (4-9 mm diameter) mature to shining black, occasionally remaining green.

Are there any similar species? *Sambucus pubens* has pyramid shaped flower and fruit clusters and brown stem pith.

Why is it weedy? Produces many well-dispersed seeds. Leaves are toxic so it is not grazed. It tolerates sun, shade and dry soils.

How does it spread? Seed is dispersed by birds.

What damage does it do? It invades disturbed habitats, forming moderately dense stands that inhibit regeneration of native species.

Which habitats is it likely to invade? Scrub, shrubland, fernland, disturbed forest, forest margins, modified plant communities, roadsides in coastal and lowland habitats on medium to high fertility soils.



[Plate 102] Image source weedbusters.org.nz

2.13 Stonecrop (*Sedum acre*)

What does it look like? Low-growing, succulent, evergreen, mat-forming herb (<10cm high) with fibrous roots and fleshy, round, creeping stems that take root at nodes and many short erect sterile and flowering stems. Ovalish, yellowish, hairless leaves (5 x 3 mm) are very fleshy and acrid to taste. Bright yellow star-like flowers (12 mm diameter, Nov-Mar) have five sharp petals and are followed by many seeds in dry, splitting follicles.

Are there any similar species? No similar species occur on site.

Why is it weedy? Succulent leaf and stem fragments root, giving it a creeping habit. Quick maturing; produces very many, relatively long-lived and well-dispersed seeds. Tolerates wind, salt, very hot to hard frost, drought, poorest soils. Intolerant of poor drainage, wet sites.

How does it spread? Seed, stem and leaf fragments spread by soil and occasionally water, road graders, traffic and gravity (cliff areas) and also by deliberate movement and plantings. Sources include waste places, rail tracks, walls and banks, roadsides.

What damage does it do? Forms dense mats, excluding almost all other species. Threatens rare native low-growing cliff and shingle species.

Which habitats is it likely to invade? Tall and short tussockland, bare land, limestone cliffs, rocky, stony, gravelly areas from sea level to 1500 m.



[Plate 113] Image source weedbusters.org.nz

2.14 Gorse (*Ulex europaeus*)

What does it look like? Sharply spiny shrub (<2-3 m tall) with woody erect or spreading stems which are many-branched in younger plants but become bare at the base as the plant gets older. Leaves are reduced to spines, new leaves less so. Spines are deeply furrowed. Pea-like yellow flowers (13-20 mm long, May-Nov, sometimes all year) are followed by hairy seed pods (13-25 mm long) which turn black when mature and explode to release seeds.

Why is it weedy? Produces massive numbers of long-lived seeds, matures and grows rapidly, and is versatile about habitat. Tolerates hot to cold temperatures, high to low rainfall, wind, salt, damage and grazing, and all soil types.

How does it spread? Explosion of seed pods spreads seed up to 5 m from the parent plant, and seed is also spread by soil movement and road graders, contaminated machinery, animals, boots, stock food and lime. Hedges, roadsides, waste land, farms, quarries, forest tracks, metal dumps, fire breaks, exotic forests, skid sites, and riverbeds are all common seed sources.

What damage does it do? Forms pure associations temporarily in many habitats, inhibiting the establishment of native plant seedlings. Increased nitrogen in poor soil types changes native species able to grow there. Can be a nursery crop for native species, dying back when overtapped, but less likely on dry sites.

Which habitats is it likely to invade? Shrublands, forest margins, coastline, tussockland, fernland, wetland, consolidated sand dunes, gumlands, cliffs, disturbed forest, exotic plantations, poor pasture, and bare land.



[Plate 12] Image source weedbusters.org.nz

2.15 Spur valerian (*Centranthus ruber* subsp. *ruber*)

What does it look like? Perennial plant up to 80 cm tall, with a woody base and tap root. Leaves are green or blue/green. Flower heads are deep pink, red or white and are made up of many small flowers. In full flower from October to December but can flower until June.

Are there any similar species? No similar species occur on site.

Why is it weedy? Spur valerian can quickly form dense stands shading out other plants.

How does it spread? Spur valerian produces lots of wind spread seeds and roadsides are common seed sources.

What damage does it do? It outcompetes and inhibits the establishment of native plant seedlings. It is a serious threat to rare native plants which are found on rocky outcrops and cliffs.

Which habitats is it likely to invade? Spur valerian is usually found in rocky coastal areas but can also be found growing inland. In Canterbury it is spreading along roadsides.



[Plate 13] Image source nzpcn.co.nz

2.16 Pig's ear (*Cotyledon orbiculata*)

What does it look like? Succulent (<1.3m tall) with powdery-looking, grey-green opposite leaves (<13 x 6 cm) with red margins. In summer clusters of orange, bell-shaped, drooping flowers (2.5cm) form on stalks (60cm) from the centre of leaf rosette.

Why is it weedy? Fast growing, outcompetes native species.

How does it spread? Seed spreads by wind and gravity.

What damage does it do? It outcompetes and inhibits the establishment of native plant seedlings. It is a serious threat to rare native plants which are found on rocky outcrops and cliffs.

Which habitats is it likely to invade? Coastal slopes and beaches, often on steep banks, rocky outcrops, cliff faces and bare ledges, sometimes in low scrub and dry depleted grassland. Coastal cliffs, rocky bluffs.



Photo: Carolyn Lewis



Photo: Carolyn Lewis



Photo: Carolyn Lewis



Photo: Carolyn Lewis

[Plate 14] Image source weedbusters.org.nz

APPENDIX B – Plant Inspection Template

Contractor / Supplier:			
Description:		Make:	
Rego Number:		Model:	
Serial Number:		Date of Manufacture:	
KM / HRS at Inspection:		KMs / HRS at last Service:	
Serviced By:		Date Serviced:	
Estimated Hire Duration:		Next Service Due:	
MCD Allocated Site No.:		Proposed / On Site Date:	

Record Result of Check: Good Condition: **INITIALS** Bad Condition: **X** Not Applicable: **N/A**

Description	<small>* Refer to Operators Manual</small>	<small># Refer to Plant Service History</small>	S/C Confirm	MCD/BE Verify	Description	S/C Confirm	MCD/BE Verify
General Safety Equipment (All Plant)					Cranes		
All safety signs / stickers are in place *	*	*			CraneSafe sticker. Date: / /		
Emergency Stops are fitted / working					Regulatory authority plant registration certificates available in unit Date: / /		
Beacon is fitted and working, if mobile plant / vehicle / UHF Fitted					Handrails, if required.		
Any lifting / rigging gear is tagged					Load charts available/SWL clearly marked *	*	*
Any lift point is engineered / stamped *	*	*			Load indicators fitted and working (electronic) *	*	*
Has a Noise Level Test been taken (where applicable)					Wire rope certs, hook certs 10yr inspection #	#	#
Fire extinguisher is fitted and in date – within 6 months. Date: / /					Concrete boom pump/ line pump		
Bunding is supplied to ALL stationary plant					Regulatory authority plant registration certificates available in unit		
Reverse alarm fitted & working, if mobile plant/vehicles					Line thickness testing reports completed and available? (Concrete volume records for twin wall lines – under OEM maximum)		
Is first aid kit required YES / NO If yes, has it been supplied. Date: / /					All pipeline joints are fitted with safety clip and locks.		
Access / egress adequate (steps, ladders, handrails)					Gensets / Light towers / Electrical / Welders		
Operator controls in good condition and labelled where applicable for function (pedals, hand brakes, emergency stop controls etc.).					Electrics are tested and tagged		
Walk Around Check (All Plant)					RCD is fitted and tested (monthly)		
Panel damage					Any damage on leads		
Oil / fluid leaks					Light operation and mast *	*	*
Broken lights / glass / mirrors					Excavators / Earthmoving Equipment		
Lights operate correctly					Anti-burst valve *	*	*
Battery isolator fitted and working *	*	*			Quick Hitch in good condition *	*	*
All tyres are in safe condition					ROPS (Roll Over Protection Structure) and FOPS (Falling Object Protection Structure) fitted *	*	*
Seats / seat belts operational and in good condition					Condition of buckets / blades		
Wipers / washers					Tracks and running gear in good condition		
Check brakes are operational					Safety pin fitted to attachments e.g. hydraulic quick hitch		

Description	* Refer to Operators Manual # Refer to Plant Service History	S/C Confirm	MCD/BE Verify	Description	S/C Confirm	MCD/BE Verify
Clean, free of soil, mud and foreign materials (including weeds and seeds)				Compressors and Pumps		
Forklifts / Access Equipment				Last receiver/boiler inspection date (max 2yrs) *	*	*
Harness latch on bars present *	*	*		Safety valve test date (max 4yrs) *	*	*
All attachments are tested and tagged				B/A Test Date: ____ / ____ / ____ *	*	*
ROPS (Roll Over Protection Structure) and FOPS (Falling Object Protection Structure) fitted *	*	*		Hydraulic Power Pack / Units		
Safe Working Limits (SWL) clearly marked				Oil / fluid leaks		
Electrical test and tag is current on power outlets				All hoses for wear and damage		
(Boom lifts) Fall arrest harnesses are available on plant, inspected, tagged, and in good condition				Hydraulic oil is biodegradable, if working near or over water *	*	*
OEM Secondary Protective System (SPS) installed on all Boom Type Elevated Work Platforms (eg Pressure-sensitive operator contact device, Protective structure, Proximity systems, Contact switches)				All hoses are sheaved that work near or over water		
Marine Vessels & Equipment						
Certificate of Operation (COO) is current & onboard						
Certificate of Class survey is current & onboard						
Vessel Safety Management System (VSMS) is current & onboard						
Flag State Certificate (FSC) is current & onboard						
All other maritime certificates & insurances are current (refer current Periodic Inspection – Marine Vessels & Equipment or equivalent)						
Vessel name and number displayed clearly						
Vessel's / ship's log onboard						
Navigation, radios & safety equipment supplied, working & in date (as per survey requirements)						
Visual hull, propellers, cargo damage evident						
Refer to current Periodic Inspection for specific condition						

TAKE PHOTOS OF THE ITEM – ENSURE YOU INCLUDE ANY DAMAGE

Supply of MANDATORY documentation:						
Description	S/C Confirm	MCD/BE Confirm	Description	S/C Confirm	MCD/BE Confirm	
Plant Risk Assessment is supplied			Suppliers incoming inspection provided			
Log book supplied			Operators manual specific to item of plant - sighted and kept with plant			
Last inspection & service report/history are in the plant & service sticker applied/noted in log book.			Weed and seed hygiene declaration / certificate attached (if required)			
Add site specific requirements						

Notes / Comments

X : BAD CONDITION - where the plant is found to not conform to the above, then it will be Tagged out and prevented from commencing work on the site until the non-compliance is rectified.

Actions / Repairs to be Undertaken:	Action Closed By (date & initial):

SUBCONTRACTOR CONFIRMS THAT THE ITEM OF PLANT COMPLIES WITH ALL SAFETY REQUIREMENTS AND (IF REQUIRED) ANY REPAIRS HAVE BEEN COMPLETED.

NAME: _____

POSITION: _____

SIGNED: _____

DATE: / /

McConnell Dowell/Built Enviros will not reimburse the Contractor / Supplier for any down / lost time so caused from any non-conformance. This form does not remove any liability for the plant supplier to conform to the relevant WHS Legislation.

OFFICE USE ONLY

I consider that the equipment is in suitable condition for use.

NAME: _____

POSITION: _____

SIGNED: _____

DATE: / /

IF SUITABLE, ATTACH SITE INSPECTION STICKER TO PLANT / VEHICLE

This is to certify that the plant being supplied conforms to the relevant WHS legislation and the requirements as detailed above. McConnell Dowell/Built Enviros will check this Incoming Outgoing Plant Inspection to ensure the supplier has verified compliance to legislative requirements and to register the plant on the site. The operator will be required to participate in ongoing training and perform work in accordance with the relevant Work Method Statement.

Appendix L

B9 Ecology Management Plan



Mt Cass Wind Farm

Construction Ecology Management Plan



Revision 5 – 23 March 2023

This document has been prepared for the benefit of Mt Cass Wind Farm Ltd (MCWF). No liability is accepted by this company or any employee or sub-consultant of this company with respect to its use by any other person. This disclaimer shall apply notwithstanding that the report may be made available to other persons of an application for permission or approval to fulfil a legal requirement.

Revision History

Version	Description	Date	Prepared by	Approved By
Rev 1	Draft	03 Mar 21	HW	
Rev 2	Draft	20 Apr 21	CS, HL	
Rev 3	MCD Input	1 Dec 22	DK	AH
Rev 4	MCD Amendments post reviewer comments	23 Dec 23	DK	MC
Rev 5	Post CLG review and Issue to HDC	23 Mar 23	MC	GG

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1. Introduction

1.1 Purpose

The purpose of this plan is to inform people involved in the Mt Cass Wind Farm (MCWF) project how to control potential construction-related ecological impacts and to comply with the requirements of the resource consent and any other regulatory requirements during the construction works. The plan covers the construction phase of the wind farm and forms part of the Construction Management Plan (CMP).

1.2 Overview

Ecology Management is primarily the responsibility of the Project Director and begins with hazard awareness and risk minimisation.

The plan sets out construction Ecology risks and associated management processes to mitigate the identified Project Risks. This plan should be read in conjunction with the MCWF Environmental Management Plan (EMP), which addresses the pre-construction requirements for Ecology.

During construction, all contractors engaged by MCWF will be responsible for ensuring that this plan is correctly implemented and will review all documentation relating to this plan before they are finalised and issued.

1.3 Existing Site Conditions

The Project site has been recognised for its unique, diverse, and well-established ecological and indigenous habitats. It is located within a limestone ecosystem which is a rare ecosystem type with ecologically significant indigenous forest remnants and regenerating shrublands that comprise distinct assemblages of plants associated with limestone rock landforms. A large collection of ecological surveys and assessments have been completed in support of resource consent applications and the development of the CMP and the EMP.

Key species located within the Project site that are to be protected and will be supported through the development of the Mt Cass Conservation Management Area include:

- Indigenous vegetation communities e.g. Tōtara – (matai)/kōwhai – māhoe/kawakawa forest, Broadleaf – five-finger – (māhoe)/(ongaonga) forest and tussock grassland.
- Nationally Endangered McCaskill’s hebe and Canterbury Limestone Wheatgrass, and other plant species considered Nationally Vulnerable or Declining.
- 18 native bird species, including the South Island pied oystercatcher and NZ pipit which are At Risk – Declining and the NZ Eastern Falcon which is Nationally Vulnerable.
- Waitaha gecko and southern grass skink are two reptile species classified as At Risk: Declining.
- Wainuia edwardi snails, located between Chainage 80 and 800 (approx) on Mt Cass Road.

2. Consent Conditions

Appendix C of the Construction Management Plan includes a matrix of all consent conditions that are included in the Construction Management Plan and Subplans. The following Table contains the specific conditions that pertain to this plan:

Relevant Consent: HDC RC070250 and CRC214150			
Ecan	HDC	Consent Conditions	Control for Consent Conditions
3	6	No construction activities authorised by this consent shall occur within the exclusion zones identified in the Golder Associates plans referred to in conditions [3],[4] and [5] except for fencing, the walking track referred to in condition [143] and any stabilisation of rocks.	Design – The construction will be designed not to enter into these zones. The exclusion zones will be physically segregated from construction activities when they take place within distances dictated in condition 7.
	7	Those parts of the boundaries of the exclusion zones identified on Golder Associates plans CG161.3-166.3 dated 20 December 2010 (being parts of those exclusion zones within 10 metres of proposed activities authorised by this consent) shall be physically identified and marked on the ground prior to any construction activities taking place within 50 metres of those areas.	Under the permit-to-work process, these zones will be fenced off prior to the permit being granted to work in the zone.
	9	The final position of the activities referred to in conditions [3],[4] and [5] may be the subject of minor adjustment (also known as micrositing) provided that any such adjustment shall not result in the maximum limits set out in condition [13] being exceeded.	Micrositing has been completed and these areas will be taken into account in the design of the project and any disturbance accounted for under the consent limits. Should micrositing be required due to unsuitable foundations then the disturbance limits in condition 13 will be taken into

			account prior to agreeing the new location.
	10	<p>In undertaking the micrositing process, the Consent Holder shall engage:</p> <p>A suitably qualified and experienced ecologist; and</p> <p>A suitably qualified and experienced expert in karst landscapes</p> <p>(both to be approved by the Manager Environmental Services of the Hurunui District Council) to advise (in consultation with a representative of the Department of Conservation) on the final placement of turbines and the final location of those activities referred to in [3],[4] and [5].</p>	<p>Tony Payne of RMA Ecology has been engaged as the project ecologist.</p> <p>James Muirson of Aurecon has been engaged as the karst expert.</p>
6		The works shall be limited to the construction footprint identified in Plan CRC214150A and scope of the works limited to those shown on Plan CRC214150B and CRC214150C, except that the Consent Holder may change the final locations of the turbines (a process known as micrositing) provided that:	
a.		No turbine shall be located more than 140 metres from the locations of the turbines shown on Plans CRC214150B and CRC214150C;	
b.		The maximum vegetation clearance limits set out in Condition [2] shall not be exceeded;	
c.		In undertaking the micrositing process the consent holder shall engage to provide advice a suitably qualified and experienced:	
		ecologist; and	
		expert in karst landscapes; and	
d.		The final site layout plan and summary of ecology and karst landscape inputs to any micrositing shall be submitted to Canterbury Regional Council, Attention: Regional Leader – Monitoring and Compliance on request.	
	11	In undertaking the micrositing process provided by condition [10] the Consent Holder shall have particular regard to any advice received from the ecologist and the expert on karst landscapes. In any instance where the Consent Holder is unable to follow the advice from the ecologist or the expert on karst landscapes due to other micrositing factors, the Consent Holder shall provide the reasons in writing in a report to the Hurunui District Council, 40 working days prior to construction commencing.	Refer to section 5.5

	12	Any indigenous vegetation or limestone features outside the exclusion zones which are able to be avoided as a result of the micrositing process provided for in condition [8] shall be physically identified prior to construction activities taking place in that location.	Refer to section 5.5												
2	13	<p>The total area of indigenous shrubland and forest clearance and limestone pavement and boulder field disturbance due to pre-construction geotechnical investigations and construction activities shall be minimised, but in any event must not exceed the following:</p> <table border="1"> <thead> <tr> <th colspan="2">Exposed limestone disturbance (hectares)</th> </tr> </thead> <tbody> <tr> <td>Pavement and boulder field</td> <td>2.04</td> </tr> <tr> <td>Pavement</td> <td>0.89</td> </tr> <tr> <th colspan="2">Vegetation Clearance (hectares)</th> </tr> <tr> <td>Indigenous shrubland</td> <td>R90 (Ha)</td> </tr> <tr> <td>Indigenous forest</td> <td>0.71</td> </tr> </tbody> </table> <p>For the avoidance of doubt the limits set out in the above table do not include the impact from fencing and the construction of the walking track referred to in condition [143].</p>	Exposed limestone disturbance (hectares)		Pavement and boulder field	2.04	Pavement	0.89	Vegetation Clearance (hectares)		Indigenous shrubland	R90 (Ha)	Indigenous forest	0.71	<p>Refer to Sub Plan B10 Landscape Management Plan for controls on Limestone Pavements and Boulder Fields.</p> <p>The project will be designed to meet this condition and the design model will be overlaid by the relevant GIS maps to ensure that the limits are met.</p> <p>The Pre-construction plan will demonstrate that this requirement has been achieved prior to construction.</p>
Exposed limestone disturbance (hectares)															
Pavement and boulder field	2.04														
Pavement	0.89														
Vegetation Clearance (hectares)															
Indigenous shrubland	R90 (Ha)														
Indigenous forest	0.71														
4/18	14	<p>When constructing and maintaining fences within the exclusion zone and the walking track referred to in condition [14] of the Consent Holder shall minimise effects on vegetation and limestone by adopting the following approaches:</p> <p>Finalising the detailed alignment of the walking track by providing an outline plan to be certified by the Manager Environmental Services of the Hurunui District Council at least one month prior to any construction activities occurring;</p>	Section 5.7 of this plan												

		<p>Hand cutting of indigenous vegetation;</p> <p>Avoiding the use of wheeled mechanical equipment or tracked vehicles (such as tractors or excavators) on in situ limestone pavement; and</p> <p>Otherwise minimising disturbance to limestone surfaces.</p> <p><u>But in any event</u></p> <p>The maximum extent of vegetation clearance for the construction of the walking track referred to in condition [143] shall not exceed 0.25 ha of indigenous shrubland and 0.05 ha of indigenous forest.</p>	
	19	<p>Every two weeks during construction the Consent Holder shall provide written confirmation to the Hurunui District Council of the total extent of clearance of indigenous shrubland and forest and impacts on limestone pavement and boulder field and confirmation that the limits set out in condition [13] have not been exceeded. If required, the Consent Holder shall facilitate site inspections and provide access to relevant GIS information to assist in the independent assessment of compliance with condition [13].</p>	<p>Survey controls will be used to ensure that the areas constructed to design and only the minimum areas are disturbed. This will be reported fortnightly.</p>
	20	<p>Following the completion of the works authorised by this consent, the Consent Holder shall provide the Hurunui District Council with as-built plans showing the location of all constructed turbines, access roads, substations, buried cables, transmission lines and all other works. The Consent Holder shall also provide the Hurunui District Council with independently verified written confirmation that the maximum limits of shrubland and forest clearance and disturbance of limestone landforms set out in condition [13] have not been exceeded, and the areas identified in accordance with condition [12] have been avoided.</p>	<p>Refer Section 7 Reporting.</p> <p>A 3rd party surveyor will check the contractors as-built survey in the areas identified in the GIS as being applicable to consent condition 13.</p>
		<p>Construction</p> <p>Construction Management Plan</p>	
8	31	<p>The objective of the Construction Management Plan shall be to set out the practices and procedures to be adopted to ensure compliance with consent conditions and to meet the following objectives:</p>	

	<p>a. To minimise the overall area of disturbance (by cuts, fills and placement of cover) of karst limestone features and indigenous vegetation, but in any event to ensure compliance with the maximum levels of indigenous shrubland and forest clearance and disturbance of limestone pavement and boulder field set out in condition [13];</p>	<p>Controls to minimise the disturbance of karst limestone features and pavements are discussed in B10 Landscape Management Plan.</p> <p>To meet condition 13 MCWFL will conduct a presurvey of the site identifying the areas of indigenous vegetation, shrub and exclusion areas using an ecologist.</p> <p>The design team will take these areas into account during their design to ensure that the limits set in condition 13 are met. This will be communicated in the Pre-construction Plan issued to HDC.</p> <p>The limits will be communicated to the project team through site inductions and specific training given to machine operators working on the project.</p> <p>Survey control will be used to ensure that the areas constructed to design and only the minimum areas are disturbed. This will be reported fortnightly and verified by an independent party.</p>
	<p>b. Avoid disturbance of vegetation and limestone features within exclusion zone as set out in condition 6</p>	<p>The exclusion zone identified in the Golder Associates plans will be marked out prior to construction commencing.</p>

		Avoidance of disturbance of vegetation and limestone features will be discussed site inductions and toolbox talks.
	k. To identify threatened indigenous flora within the construction zone and provide for their relocation as required by condition [32.n];	Construction sites will be searched by a qualified botanist prior to construction for threatened or at-risk plant species (as per the Environmental Management Plan). All occurrences will be recorded using GPS. All threatened flora will be relocated prior to construction works occurring. Advice will be sought from appropriately experienced nursery people on the most appropriate methods at the time such relocations are required. MCWF will operate a permit to work system whereby a permit to start construction in designated zones will be required ensuring that all pre-construction requirements have been met prior to construction starting in a zone.
	l. To identify Canterbury gecko and other lizard species within the construction zone and provide for their relocation as required by condition [79];	Experienced herpetologists will be used for the rescue and relocation of geckos and lizards. All geckos and lizard species that are detected and captured by the project Herpetologist will be removed from the construction zone and relocated immediately to a

			pre-determined release site (refer to Environmental Management Plan). This will take place prior to construction starting on site by MCWFL. The permit to work system will have this consent condition being actioned as a condition prior to starting work.
		m. Minimise potential for disruption to any active New Zealand falcon nest identified within 200 m of any construction or earthwork area; and	A 200 m construction setback will be implemented (as far as practicable) from any identified New Zealand falcon nests. No construction activities (earthworks etc.) or construction vehicles will encroach within 200 m of these nests (as far as practicable). This will be discussed in site induction training making the project team both aware of the condition and providing basic training on Falcon identification.
9	32	The Construction Management Plan shall include, but not be limited to:	
		c. Details of a training programme for machinery operators working on the site who will be involved in indigenous vegetation or limestone pavement or boulder field disturbance. The training programme will include, but not be limited to, education on using least impact techniques when disturbing or clearing limestone or indigenous vegetation.	Refer to section 6 of this Plan for training requirements and further details in the Landscape Management Plan (sub plan B10).

		<p>n. Methods for the relocation of threatened indigenous flora (as defined by de Lange et al (2009))⁶ identified within the construction zone, and where practicable, At-Risk indigenous flora (defined by de Lange et al (2009)) identified within the construction zone.</p>	<p>Threatened and at-risk indigenous flora will be relocated (where practicable) prior to commencement of construction. Advice will be sought from appropriately experienced nursery people on the most appropriate methods at the time such relocations are required.</p> <p>Further detail provided in Environmental Management Plan (EMP).</p>
		<p>o. Methods for location and relocation of lizards as required by condition [79].</p>	<p>All geckos and lizard species that are detected and captured by the project Herpetologist will be removed from the construction zone and relocated immediately to a pre-determined release site (refer to Environmental Management Plan). The capture for the relocation programme will involve daily surveys using multiple techniques over five consecutive days per site. This will happen prior to construction and a permit to work system will control that it has.</p>
N/A	60	<p>Prior to undertaking any construction activities, the Consent Holder shall engage a suitable qualified and experienced ecologist to undertake a survey of the vegetation in the areas which are to be disturbed for construction purposes as detailed in condition 61. The results of this survey shall be provided to the Hurunui District Council.</p>	<p>RMA Ecology has been engaged by MCWFL</p>

N/A	73	If during construction, a falcon nest is identified on the site, the Consent Holder will ensure that, where practicable, a 200m setback of construction activity from the nest is maintained while it is still active.	<p>A 200 m construction setback will be implemented (as far as practicable) from any identified New Zealand falcon nests. No construction activities (earthworks etc.) or construction vehicles will encroach within 200 m of these nests (as far as practicable).</p> <p>This will be discussed in site induction training making the project team both aware of the condition and providing basic training on Falcon identification.</p>
19	N/A	<p>All works up to and including the completion of commissioning of the Mt Cass Wind Farm Project and any ecological works related to the Mt Cass Conservation Management Area shall be carried out in accordance with the:</p> <p>a. Construction Management Plan (CMP) required by Conditions (8) to (13) of this resource consent; and</p> <p>b. Mt Cass Wind Farm Environmental Management Plan prepared in accordance with Condition (66) of the HDC land use consent RC07250 and any subsequent updates of that document.</p>	<p>The Construction Management Plan meets this requirement.</p> <p>The MCWFL EMP meets this requirement</p>
28	N/A	During widening works on Mt Cass Road at Chainage 960 as shown on Plan CRC214150D, attached to, and forming part of this resource consent, the potential adverse effects on snail habitat shall be avoided. The following measures shall be utilised by the consent holder:	Section 5.6 Snail Habitat (Mt Cass Rd)
	a	A barrier fence shall be erected 5 metres from the road edge along road sections where road widening works will occur;	Section 5.6 Snail Habitat (Mt Cass Rd)

	b	No works shall occur outside of the barrier fence. This includes, but is not limited to, ground disturbance of any kind, the removal of pest plants (willow), rubbish, leaf packs or old fencing.	Section 5.6 Snail Habitat (Mt Cass Rd)
	c	Once the barrier fence is erected, and prior to any vegetation clearance or other works along the inside (road) edge of the barrier, a suitably qualified and experienced ecologist shall undertake an assessment of areas where vegetation clearance will be occurring to identify any live snails. If live snails are found, the snails shall be safely relocated to a suitable habitat, as determined by the suitably qualified and experienced ecologist, on the outer site of the barrier (away from the road).	Section 5.6 Snail Habitat (Mt Cass Rd)
	d	The locations of any snails relocated shall be recorded and reported to Canterbury Regional Council, Attention: Regional Leader – Monitoring and Compliance and the Department of Conservation within one month of the relocation being completed.	Section 5.6 Snail Habitat (Mt Cass Rd)
	e	At the conclusion of the earthworks, the barrier fence shall be removed.	Section 5.6 Snail Habitat (Mt Cass Rd)
	156	Prior to undertaking any activities authorised by this consent, the Consent Holder shall offer to establish a Statutory Liaison Protocol with the Department of Conservation	A Statutory Liaison Group is established and is managed by MCWFL
	157	A representative of the Department of Conservation shall be offered the opportunity to visit the site at regular intervals during construction and to offer comment on the construction process, to attend an annual meeting, and the provision of any information to which the Hurunui District Council is entitled by virtue of these consents.	

Table 1 Ecology Management Plan Consent Conditions

It is noted that conditions and mitigation measures relating to protection of limestone boulder fields, limestone pavements and cut faces are addressed in the Landscape Management Plan (sub plan 10) and conditions relating to the monitoring and management of avifauna and herpetofauna is addressed in the Project EMP.

3. Project Zones

To enable the project team to manage a staged construction and to ensure that the controls are in place a Zone system will be run as shown in Figure 1 below. The intention of the zone system is it allows staged access to the site by the consent holder and a permit to work system to be implemented that ensures that all pre-construction requirements have been carried out prior to the contractor being allowed to commence work.

It also allows sub-zones to be created which ring fences different contractors work areas and allocates who is responsible for the area.

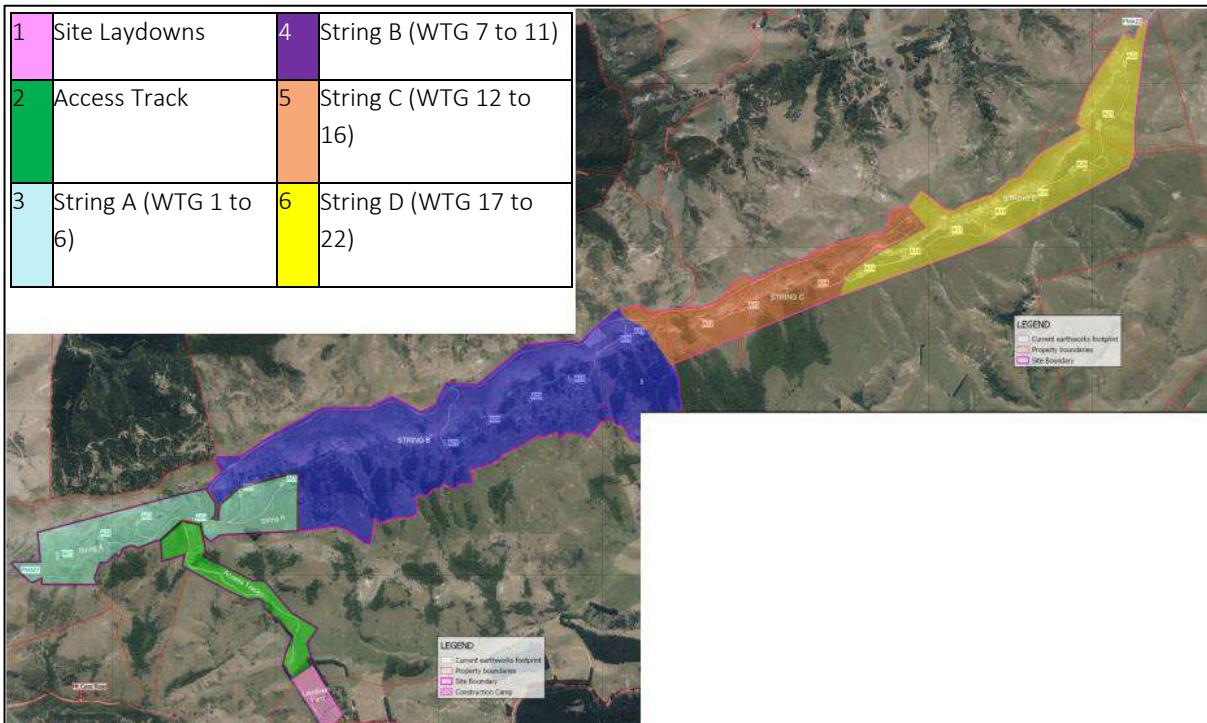


Figure 1 Mt Cass Zone Plan

4. General Control Measures

The key principles and approaches to be undertaken in relation to ecology management during construction are:

- Developing and maintaining awareness of the ecological values associated with the Project site
- Delineating and maintaining exclusion zones around areas of identified significant ecological value; and
- Identify any additional ecological aspects that may require protection or mitigation measures and seek further advice from Project Ecologists
- Design the construction scope to ensure that it meets the requirement of this consent.
- Monitoring and Reporting

5. Specific Controls

5.1 Pre-Construction Controls

Prior to construction occurring it is expected that the relocation of fauna and flora within the construction footprint would be complete in accordance with the EMP. MCWFL will issue the contractor a permit to work to confirm that an area is appropriately surveyed, and flora and fauna relocated where required prior to any construction starting.

The surveys required for each construction area are:

- Identification and where practical relocation of threatened and at-risk plant species, including the systematic search of construction sites and relocation of specimens
- Capture and relocation of lizards in accordance with the EMP
- Tussock areas surveyed and plants relocated

5.2 Exclusion zones

The plans in Appendix A of this document identify the exclusion zones where construction activities are not to take place, except for constructing or maintaining fences and the construction of the Mt Cass Walkway extension.

Fencing or delineation similar to that shown in Figure 2 around the exclusion zones is required prior to construction commencing within 50m of an exclusion zone. This delineation is to be always maintained to avoid intrusion into the exclusion zone.



Figure 2 Exclusion Zone Fencing

If a NZ falcon nest is identified during construction, a 200m setback of construction activities is to be implemented. Delineation of the setback is to be provided to ensure construction activities maintain the required distance.

5.3 Permit to Work

Prior to disturbance of land in a zone, MCWFL and the relevant contractor will need to issue a Vegetation Disturbance Permit which is designed to ensure that all pre-construction activities have been carried out, as required under the resource consent by MCWFL, such as lizard relocation, and that controls have been put in place by the contractor such as exclusion zone fencing.

An example template of this permit is found in Appendix B of this management plan.

5.4 Limits of Indigenous Vegetation Disturbance

The project is limited to the disturbance limits of indigenous vegetation shown in Table 2

Vegetation Type	Limit (Ha)
Indigenous shrubland	0.71
Indigenous forest	0.08

Table 2 Indigenous Vegetation Clearance Limits

The project will meet these requirements by incorporating a GIS map with base line data from the Ecological survey carried out on behalf of MCWFL into the design model. This will allow the project to ensure that the permanent works design and vegetation clearance measure meets condition 13.

These areas can then be input into the Earthworks subcontractors' machine control alerting them of the need to work accurately within the design footprint in these areas.

5.5 Micro Siting

MCWFL have carried out micro-siting as part of the early works phase of the project. Therefore, the only reason that a turbine foundation should have to be micro-sited is if ground conditions encountered during excavation is found to be unsatisfactory. For example, if a large tomo is exposed.

If micrositing is required, this will be reported to HDC and carried out within the conditions of the resource consent.

5.6 Snail Habitat (Mt Cass Rd)

The contractor awarded the Mt Cass Rd Upgrade will, prior to construction in the vicinity of CH960, indicated in Figure 3 erect a temporary fence 5m from the road edge to form an exclusion zone for the protection of snails. No foot traffic or disturbance of the ground and vegetation will occur outside of this exclusion zone.

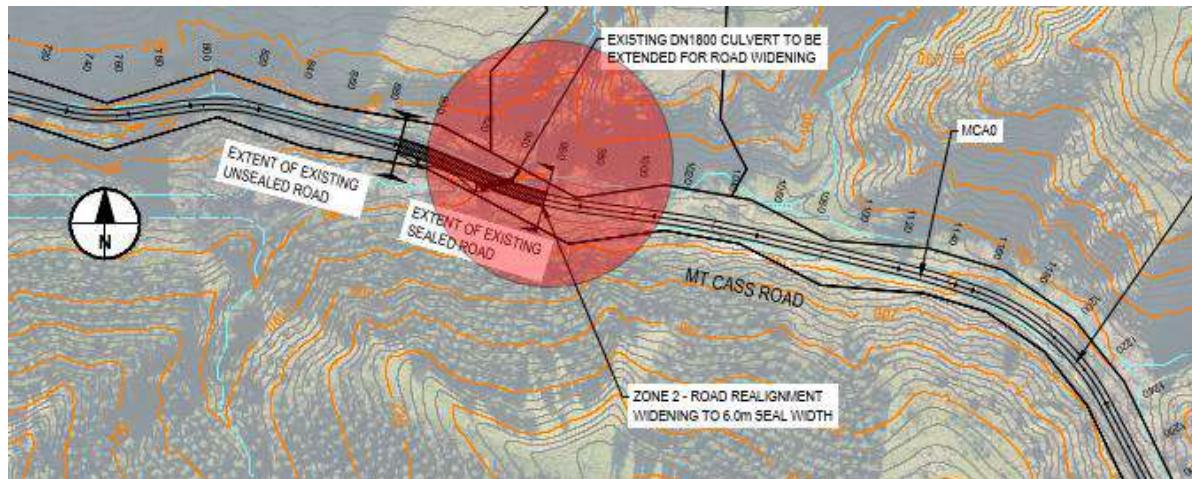


Figure 3 Mt Cass Road Snail habitat location CH 960m

Prior to any work being carried out a suitably qualified ecologist will undertake an assessment of the area and relocate any live snails into the exclusion zone. Locations of snails relocated shall be recorded and reported to ECan.

5.7 Site Fencing and Walking Track Disturbance

At the time of drafting this plan the site fencing and walking track are still under design. Once designed the final alignment will be issued to HDC with the pre-construction plan prior to construction taking place.

Where the fence or walking track traverse through exclusion zones or areas of indigenous shrub and forest the vegetation will be hand cut to minimise disturbance.

These areas of disturbance will be recorded and as-built to meet the requirements of conditions 14 of the HDC consent which states the limits of disturbance are shown in Table 3.

Vegetation Type	Limit (Ha)
Indigenous shrubland	0.25
Indigenous forest	0.05

Table 3 Vegetation Clearance Limits for the Walking Track

The contractor will avoid the use of wheeled mechanical equipment or tracked vehicles (such as tractors or excavators) on in situ limestone pavement to minimise the disturbance to limestone surfaces.

6. Training – On-site Personnel

All staff and subcontractors will receive appropriate training that is relevant to the environmental aspects of their work. This will include the training detailed out in the following sections.

6.1 Induction training

A comprehensive environmental induction will be provided to all staff and subcontractors prior to starting work on site. The induction will include a briefing on this plan, including the main content of the plan, relevant consent conditions and key requirements and staff responsibilities in relation to this plan.

This induction will include the items identified in the training matrix in Table 4 below that are specific to this management plan and are specific to the persons role on the project. A full training matrix is located in the CMP.

Mt Cass Windfarm Training Matrix						
Training Area	Construction Worker	Machine Operator	Management	Fire Response Team	Enviro Team	Visitor
Ecology	Exclusion Zones	Exclusion Zones	Exclusion Zones	N/A	Exclusion Zones	General Awareness
	NZ Falcon vs Hawk identification training	NZ Falcon vs Hawk identification training	NZ Falcon vs Hawk identification training		NZ Falcon vs Hawk identification training	
	Lizard awareness training	Lizard awareness training	Lizard awareness training		Lizard awareness training	
	Vegetation Permit to work requirements	Vegetation Permit to work requirements	Vegetation Permit to work requirements		Vegetation Permit to work requirements	
	Least impact techniques for indigenous vegetation disturbance	Indigenous vegetation limitation and survey requirements	Least impact techniques for indigenous vegetation disturbance		Least impact techniques for indigenous vegetation disturbance	
	Sink Holes / Tomos	Basic indigenous flora and fauna training	Indigenous vegetation limitation and survey requirements		Indigenous vegetation limitation and survey requirements	
	Key ecology contacts	Sink Holes / Tomos	Basic indigenous flora and fauna training		Basic indigenous flora and fauna training	
		Key ecology contacts	Sink Holes / Tomos		Sink Holes / Tomos	
			Key ecology contacts		Key ecology contacts	
			Reporting requirements			
			Micro-siting requirements			

Table 4 Ecology Management Plan Training Matrix

6.2 Toolbox Talks

Weekly toolbox talks will be conducted for site personnel to deliver specific training and to ensure all personnel are aware of the key ecological issues relevant to the works.

6.3 Other Training

Additional is detailed in the training matrix in section 7 of the CMP.

7. Reporting

MCWFL will report the area of disturbance of indigenous shrub and forest provided to them by the earthworks subcontractor every fortnight to meet the requirements of condition 19.

The information for this report will be determined by carrying out an as-built survey of the areas identified as relevant to this consent condition in the GIS map and comparing it with the design areas.

At the end of project, a report will be issued providing the total area of vegetation disturbed. This will consist of the contractors as-built survey which has been third party verified by an independent surveyor.

8. Monitoring and Maintenance During Construction

As part of the control measures, on-going site monitoring by the contractor and wider project team will be undertaken. This will ensure that all the control measures detailed in this plan have been properly implemented and are functioning effectively.

Monitoring shall occur for the full duration of the works. Any control measures requiring maintenance or adaptation to allow construction tasks to occur shall be identified and implemented by the Environmental Manager to ensure continual compliance.

It is noted that significant ecological monitoring is required by the HDC consent conditions and is detailed in the EMP.

9. Roles and Responsibilities

9.1 Project Contact List

The project key contacts are listed in Table 5 below.

Consent Holder – Mt Cass Windfarm Ltd				
Role	Company	Name	Phone	Email
Project Director	MCWFL	Greg Gummer	021 738 995	greg.gummer@mainpower.co.nz
Construction Manager (Primary Contact)	MCWFL	TBC		
Secondary Contact (Civils)	MCWFL	Michael Carstens	027 247 1713	michael.carstens@mainpower.co.nz
Secondary Contact (Electrical)	MCWFL	Neil Wiggins	027 33133	neil.wiggins@mainpower.co.nz
Senior Project Coordinator	MCWFL	Lisa Yuyi	021 779 380	lisa.yuyi@mainpower.co.nz
Ecology	RMA Ecology	Graham Ussher	027 272 7930	graham.ussher@rmaecology.co.nz
Herpetofauna (Lizard) Management	RMA Ecology	Graham Ussher	027 272 7930	graham.ussher@rmaecology.co.nz
Avifauna (Bird) Management	Kessels & Associates (T/A Bluewattle Ecology)	Gerry Kessels	027 286 8449	gkessels@bluewattle.co.nz
Plant Management	RMA Ecology	Tony Payne	027 807 9018	tony.payne@rmaecology.co.nz

Weed Management	Wai-Ora	Lauren Scott	027 480 8007	lauren@wai-ora.nz
Animal Pest Management	Pest Control Solutions	Fraser Maddigan	027 525 3619	Bradley855@gmail.com
Other advisors	Geotech Consulting Ltd	Andrew Hurley	027 479 1516	ahurley@geotech.co.nz

Table 5 Mt Cass Wind Farm Project Ecology Contact List

CBoP – McConnell Dowell				
Role	Company	Name	Phone	Email
Project Manager	MCD	Phil Owen	021638726	Phil.owen@mcdgroup.com
Construction Manager	MCD	David Kidd	0277039803	David.kidd@mcdgroup.com
Site Manager	MCD	TBC		
HSEQ Manager	MCD	Clint Hill	0277028309	Clint.hill@mcdgroup.com
Project Environmental Advisor	MCD	Caitlin Burns	021759938	caitlin.burns@mcdgroup.com
Foreman (Environmental	MCD	TBC		
Earthworks Manager	Taylor Contracting	Shannon Proctor	021501894	shannon@taycon.co.nz
Batching Plant Manager	Firth	Mark Cresswell	0274776958	mark.cresswell@firth.co.nz

Table 6 cBoP Key Project Contacts List

9.2 Responsibilities

Table 7 below defines the key responsibilities for the relevant roles to the management plan.

Role	Role Responsibilities
Construction Manager	<p>Has responsibility for this plan.</p> <p>Is to engage suitable specialists to carry out the requirements of this consent and report to HDC and ECan.</p> <p>Running the permit to work system for the Mt Cass Construction Zones and ensuring that all ecological requirements are completed prior to issuing permit to work.</p> <p>Reporting to the regulator if micro siting results in engaged experts advice not being able to be followed.</p> <p>Report disturbance limits to the regulator fortnightly and final 3rd party verified report.</p>
Environmental Advisor	<p>Reviewing and reporting on environmental performance.</p> <p>Inspection of works to assess compliance with the management plans.</p> <p>Inspections, auditing and checking of environmental management practices and procedures.</p> <p>Responds to and investigates all environmental complaints, issues or incidents.</p> <p>Responsible for on-site compliance with consent conditions and other requirements and tracking compliance information.</p> <p>Notifies the Construction Manager and Regulatory Authorities of any significant non compliances.</p> <p>Report to the Construction Manager changes to construction techniques or natural environmental changes which require alterations to existing consents or require new resource consents.</p> <p>Update and maintain the environmental portion of the Project Risk Register.</p> <p>Training of all staff including subcontractors on the ecological management requirements.</p>
Ecological specialists <ul style="list-style-type: none"> • Wildlife Act approved herpetologist • Botanist • Avifauna ecologist • Snail Ecologist 	<p>Responsible for lizard recovery.</p> <p>Responsible for identification and relocation of threatened and at-risk plant species.</p> <p>Responsible for avifauna surveys and monitoring and identifying exclusion zones for Falcon nesting</p> <p>Responsible for the inspection for and relocation of snails at CH 960 on Mt Cass Rd and issuing a relocation report to MCWFL to issue to ECan.</p>
Construction team	

<ul style="list-style-type: none"> • Civil contractor PM • Other Contractors PM(s) • Mt Cass Rd Upgrade Contractor PM 	<p>Reports all ecological incidents and complaints to the Environmental Manager.</p> <p>Ensures that work is stopped if protected flora or fauna is found</p> <p>Carrying out fortnightly surveys of disturbed locations and issuing results to MCWFL.</p> <p>The installation of exclusion zone fencing</p> <p>Overall responsibility for ensuring this plan is correctly implemented for their section(s) of work.</p> <p>Responsible for ensuring that their personnel are suitable trained in the requirements of this plan.</p> <p>In addition to their responsibilities under this plan are also responsible for the protection of snails at chainage 960 on Mt Cass Rd.</p>
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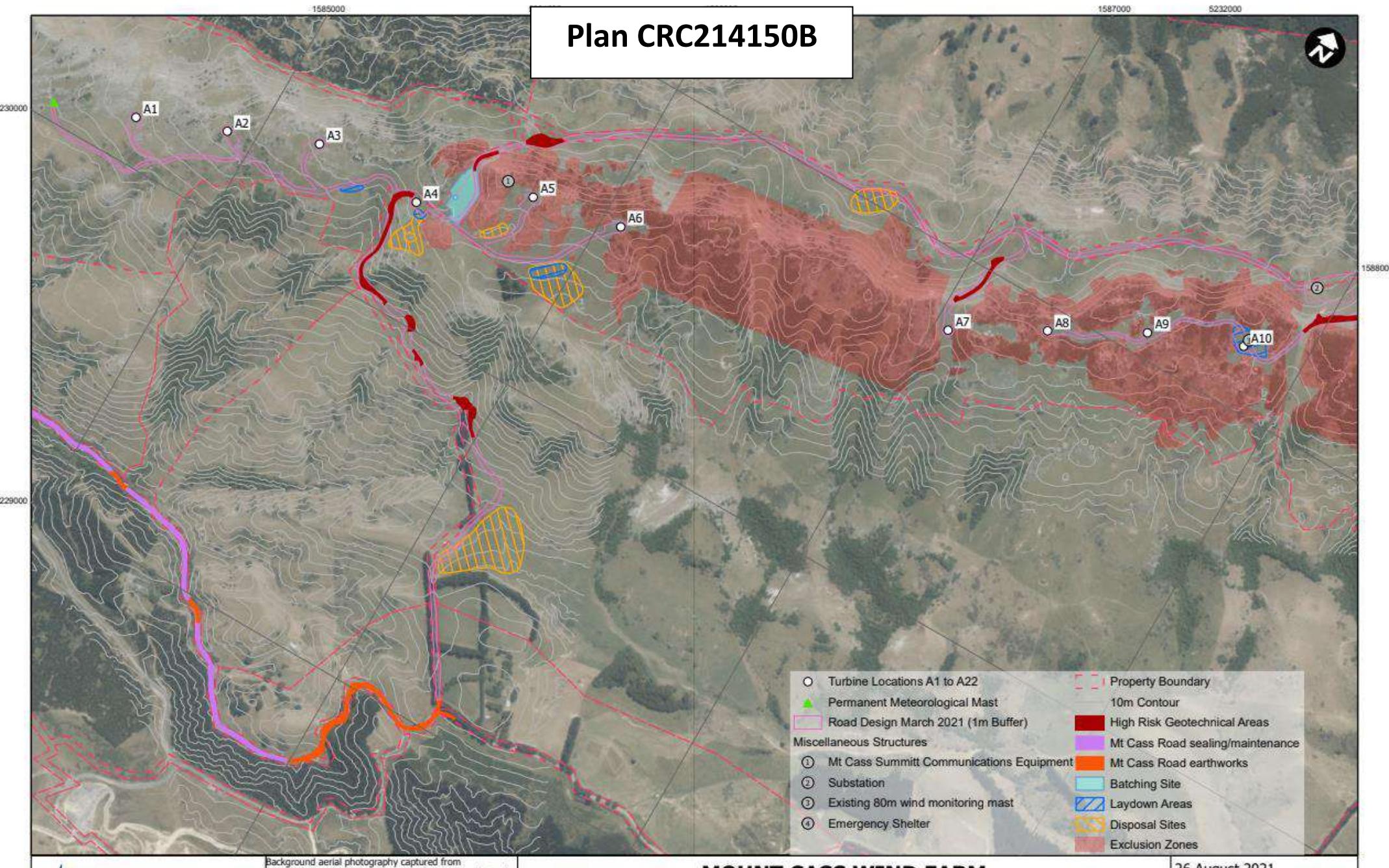
Table 7 Ecology Plan Roles and Responsibilities

10. Appendices

Appendix	Description
A	Exclusion Zone
B	Vegetation Permit Template

APPENDIX A – Exclusion Zones

Plan CRC214150B

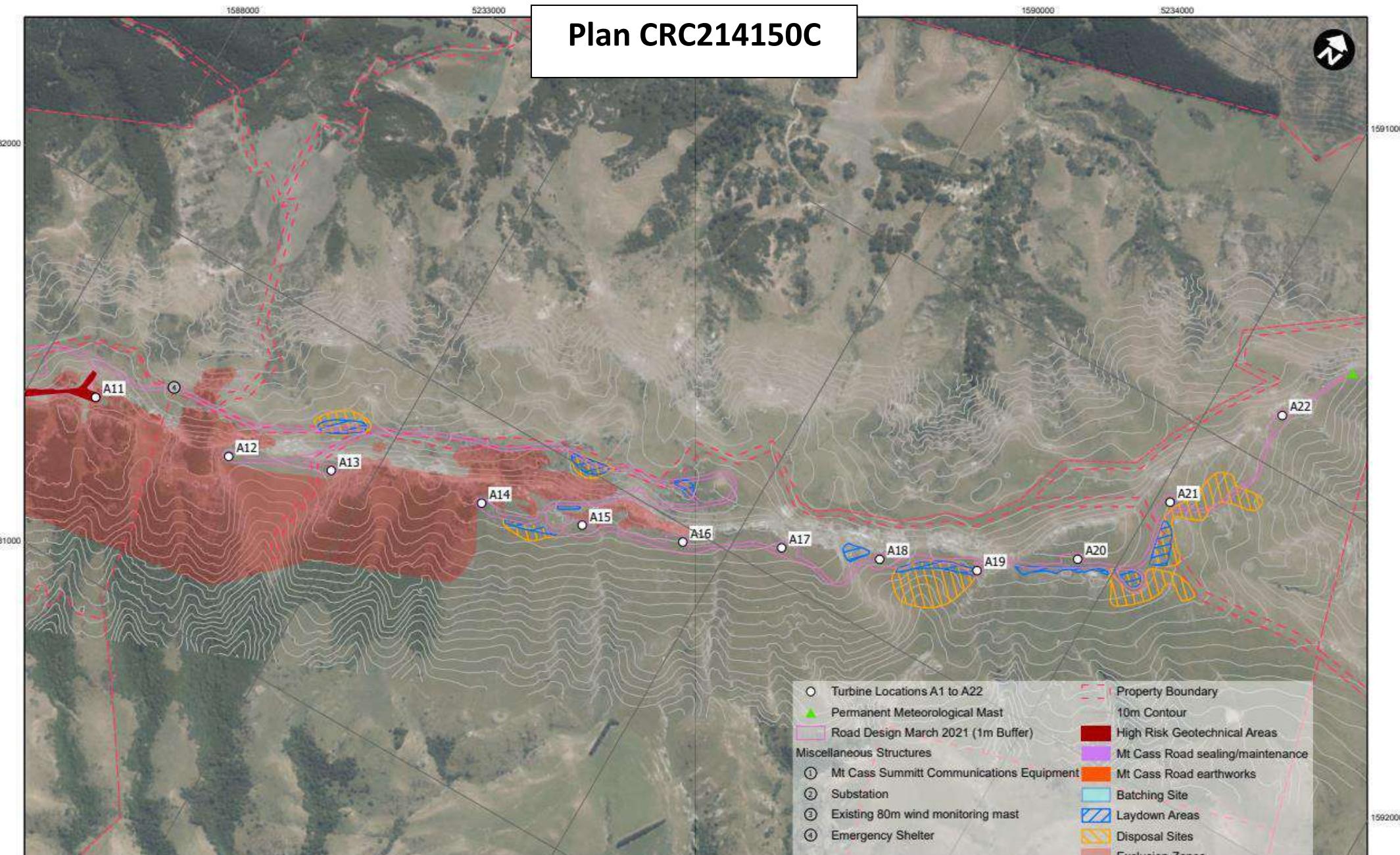


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<https://data.linz.govt.nz/layer/95549-kakoura-030m-rural-aerial-photos-2016-2017/>

MOUNT CASS WIND FARM 22 TURBINE LAYOUT CONSENT PLANS

26 August 2021
Scale (at A3): 1:10,000
Drawing: 4755.1 Rev: C

Plan CRC214150C



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<https://data.linz.govt.nz/layer/95549-kakoura-030m-rural-aerial-photos-2016-2017/>

MOUNT CASS WIND FARM 22 TURBINE LAYOUT CONSENT PLANS

26 August 2021
 Scale (at A3): 1:10,000
 Drawing: 4755.2 Rev: C

APPENDIX B – Vegetation Clearance Permit

Vegetation Disturbance Permit

HSEQ-HS-FRM065-GEN-ALL

Section 1 - Permit Details			
Permit No:	VDP:	Date of Request:	
Location of Work:		Date for Works to Commence:	
Nominated Permit Holder:		Date for works to Finish:	
This permit is required for ALL vegetation disturbance to ensure work areas and activities are assessed by the Environmental team to confirm approval conditions are fulfilled and risks are appropriately managed. Permit Valid for 1 week.			
A minimum of 7 days' notice is required for this permit to be processed. Permit to disturb must be raised with the Environmental Team and site walk organised.			
Section 2 - Disturbance			
Type of Disturbance:	Detail type of disturbance required, type of impact, number of trees, total area, type of tree/veg, equipment used etc.		
Scope of works			
Map of Area/SEP attached	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Section 3 - Pre Walk Check			
<input checked="" type="checkbox"/> Tick box if applicable			
Prompt	Tick Box		Additional Controls/ Comments
Is the disturbance footprint known and agreed? Are limits clearly defined?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are works within a heritage overlay/ subject to CHMP conditions?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Have protected trees/ vegetation been clearly defined?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Do erosion and sediment controls need to be installed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Will works be directly supervised?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are the appropriate approvals in place?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are there any weed and hygiene protocols and have they been followed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Is an ecologist pre-clearance inspection required?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Is an ecologist required to be present during clearing works?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Is sequential or 2-stage clearing required for fauna management purposes?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Have community and stakeholder notification procedures been followed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Have minimum extents been approved by the project arborist?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Have vegetation and soil stockpile areas been identified and approved?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Is timber/ vegetation salvage, mulching, storage, or transport required?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
[insert project specific requirements]	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<i>The above questions should be completed in field with the site team. List any controls and additional actions. Add actions in CMO</i>			

Section 4 - Team Sign off		
Role	Name	Signature
Environmental Representative		
Supervisor		
Operator		
Arborist/Ecologist (if applicable)		
Surveyor (if applicable)		
other		
Authorised McConnell Dowell Permit Issuer:		
I authorise the task as stated above to commence subject to the conditions and precautions as indicated on this permit.		
Full Name (print):	Signature:	Date:

Permit No:			
Vegetation Disturbance Permit Closure: (by Permit Holder)			
Actions Required to Close out			
Have the conditions of the permit been met	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Have activities been catalogued	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Have pre and post photos been saved	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Name:	Signature:	Time:	Date:

Appendix M

B10 Landscape Management Plan



Mt Cass Wind Farm

Landscape Management Plan



Revision 5 – 24 March 2023

This document has been prepared for the benefit of Mt Cass Wind Farm Ltd (MCWF). No liability is accepted by this company or any employee or sub-consultant of this company with respect to its use by any other person. This disclaimer shall apply notwithstanding that the report may be made available to other persons of an application for permission or approval to fulfil a legal requirement.

Revision History

Version	Description	Date	Prepared by	Approved By
Rev 1	Draft	03 Mar 21	HW	AH/SB
Rev 2	Draft	19 Apr 21	HL	AH/SB
Rev 3	MCD Input	1 Dec 22	DK	AH
Rev 4	SQIP – MCD Updates	23 Feb 23	DK	AH
Rev 5	Post CLG review and HDC Submission	24 Mar 23	MC	GG

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1. Introduction

1.1 Purpose

The purpose of this plan is to inform people involved in the Mt Cass Wind Farm project how to manage landscape aspects and to comply with the requirements of the resource consent and any other related regulatory requirements during the construction works. The plan covers the construction phase of the wind farm and the rehabilitation of construction activities.

1.2 Overview

The Landscape Management Plan is primarily the responsibility of the Construction Manager.

The plan sets out the earthworks and landscape and visual amenity risks associated with the construction works and the management processes to mitigate the identified Project Risks. Disturbance of indigenous vegetation is not covered in this plan and is addressed in the Ecology management plan in Appendix L of the CMP.

During construction, the Civil Contractor will be responsible for ensuring that this plan is correctly implemented and will review all documentation relating to this plan before it is finalised and issued.

Site induction for all personnel must include a briefing on this plan including the main contents and any SOP's relevant to the task being performed.

2. Consent Conditions

Appendix C of the Construction Management Plan includes a matrix of all consent conditions that are included in the Construction Management Plan and Subplans. The conditions in Table 1 below are the specific conditions that pertain to this plan:

Relevant Consent: HDC RC070250 and CRC214150			
ECan	HDC	Consent Conditions	Control for Consent Conditions
	9	The final position of the activities referred to in conditions 3,4 and 5 may be the subject of minor adjustment (also known as micrositing) provided that any such adjustment shall not result in the maximum limits set out in condition [0] being exceeded.	Micrositing has been completed and these areas will be taken into account in the design of the project and any disturbance accounted for under the consent limits. Should micrositing be required due to unsuitable foundations then the disturbance limits in condition 13 will be taken into account prior to agreeing the new location.
6c	10	In undertaking the micrositing process, the Consent Holder shall engage: a. A suitably qualified and experienced ecologist; and b. A suitably qualified and experienced expert in karst landscapes (both to be approved by the Manager Environmental Services of the Hurunui District Council) to advise (in consultation with a representative of the Department of Conservation) on the final placement of turbines and the final location of those activities referred to in conditions 3,4, and 5.	RMA Ecology has been engaged as the project ecologist James Muirson of Aurecon has been engaged as the karst landform expert. See the roles and responsibility table in 7
	11	In undertaking the micrositing process provided by condition [0] the Consent Holder shall have particular regard to any advice received from the ecologist and the expert on karst landscapes. In any instance where the Consent Holder is unable to follow the advice from the ecologist or the expert on karst landscapes due to other micrositing factors, the Consent Holder shall provide the reasons in writing in a report to the Hurunui District Council, 40 working days prior to construction commencing	See the roles and responsibility table in 7
	12	Any indigenous vegetation or limestone features outside the exclusion zones which are able to be avoided as a result of the micrositing process	Refer to section 4.2.3

		provided for in condition 8 shall be physically identified prior to construction activities taking place in that location.	
	13	13. The total area of indigenous shrubland and forest clearance and limestone pavement and boulderfield disturbance due to pre-construction geotechnical investigations and construction activities shall be minimised, but in any event must not exceed the following: Pavement and Boulder Field 2.04Ha Pavement 0.89Ha	Geotechnical investigation has been carried out in the construction footprint to date and will form part of the current disturbance limits.
	14	When constructing and maintaining fences within the exclusion zone and the walking track referred to in condition 143 the Consent Holder shall minimise effects on vegetation and limestone by adopting the following approaches:	Refer to 4.2.9 of this plan
	a	Finalising the detailed alignment of the walking track by providing an outline plan to be certified by the Manager Environmental Services of the Hurunui District Council at least one month prior to any construction activities occurring;	A walkway alignment has been proposed by MCWF and agreed by HDC. This is in the 2019-2020 Annual environmental report Refer to 4.2.9 of this plan.
	f	Avoiding the use of wheeled mechanical equipment or tracked vehicles (such as tractors or excavators) on in situ limestone pavement; and	With will be controlled through subcontract contractual conditions and work pack approvals. Refer to 4.2.9 of this plan.
	d	Otherwise minimising disturbance to limestone surfaces	Refer to 4.2.9 of this plan.
	19	Every two weeks during construction the Consent Holder shall provide written confirmation to the Hurunui District Council of the total extent of clearance of indigenous shrubland and forest and impacts on limestone pavement and boulderfield and confirmation that the limits set out in condition 13 have not been exceeded. If required the Consent Holder shall facilitate site inspections and provide access to relevant GIS information to assist the independent assessment of compliance with condition 13	Refer to 4.2.2 of this plan.

	20	<p>Following the completion of the works authorised by this consent, the Consent Holder shall provide the Hurunui District Council with as-built plans showing the location of all constructed turbines, access roads, substations, buried cables, transmission lines and all other works. The Consent Holder shall also provide the Hurunui District Council with independently verified written confirmation that the maximum limits of shrubland and forest clearance and disturbance of limestone landforms set out in condition 13 have not been exceeded, and the areas identified in accordance with condition 12 have been avoided</p>	Refer to 4.2.2 of this plan.
Construction Management Plan			
9	32	The Construction Management Plan shall include, but not be limited to:	
c	c	Details of a training programme for machinery operators working on the site who will be involved in indigenous vegetation or limestone pavement or boulder field disturbance. The training programme will include, but not be limited to, education on using least impact techniques when disturbing or clearing limestone or indigenous vegetation.	Refer to Section 5. And Appendix A Site Rehabilitation Earthworks Pattern Book.
d	d	Limits of disturbance to indigenous vegetation and karst landforms in accordance with condition [13].	Refer Section 4.2.2 of this plan
e	e	Location of soil stockpiles and spoil disposal areas.	Refer Section 4.2.6 of this plan, Section 2.7.3 of the Pattern Book in Appendix A and the rehabilitation drawings in Appendix B
i	i	Procedures for earthworks, erosion and sediment control, stabilisation of the site (including the removal or stabilisation of any unstable boulders) and revegetation of existing vegetation sites with locally eco—sourced indigenous species and non-invasive, low stature grasses such as perennial ryegrass (<i>Lolium perenne</i>) and annual poa (<i>Poa annua</i>) grass species only. Aggressive exotic grasses such as browntop (<i>Agrostis capillaris</i>), cocksfoot (<i>Dactylis glomerata</i>) and brome (<i>Bromus spp.</i>) shall not be used.	Refer to section 4.2.7 of this plan, the Pattern Book in Appendix A and the rehabilitation drawings in Appendix B Also, the Erosion and Sediment Control Plan in Appendix D of the CMP
j	j	Contouring of all spoil disposal sites to visually integrate into the natural landform.	The design will consider this in cut to waste volumes and the construction work packs will ensure that this is carried out on site. Refer to Section 4.2.6 of this plan.

r	s	Procedures for rehabilitation of the areas directly affected by the construction and roading activities and the ongoing maintenance of the rehabilitation work.	Refer to section 4.2.7 of this plan, the Pattern Book in Appendix A and the rehabilitation drawings in Appendix B
t	u	Procedures for minimising the visual effect of any removal or stabilisation of unstable boulders for safety reasons during construction and operation.	Refer to Section 4.2.10 of this plan
u	v	Procedures to ensure compliance with conditions [45] and [46] for the treatment of identified areas of limestone pavement.	Refer to Section 4.2.4.2 of this plan.
Implementation of mitigation measures —Construction Phase			
	36	Any concrete batching plant on the wind farm site shall be removed within six months of completion of the wind farm construction.	Refer to Section 4.2.1 of this plan.
	45	Limestone pavement within the areas marked on Golder Associates plan CG161.3 and CG163.3 shall be covered to a sufficient depth with crushed limestone or other appropriate material as necessary so as to avoid cuts to limestone pavement.	Refer to Section 4.2.4.2 , Appendix B of this plan and section 2.6.6 of the Pattern Book in Appendix A of this plan.
	46	Limestone pavement in the areas identified in condition [45] shall be partially rehabilitated to a width for the running surface of the road of 3.5 metres in accordance with the Chris Glasson Plan, dated 15 November 2010, and the plan titled 'indicative Cross Section of the Completed Road Formation and Mitigation Measures', dated 24 July 2011, attached as Appendix 3. The Consent Holder may at any time for maintenance or decommissioning reasons reinstate full access in these areas for so long as that access is required. Once full access is no longer required the Consent Holder is to partially rehabilitate the area to the standard required by the Chris Glasson Plan dated 15 November 2010.	Refer to Section 4.2.4.2 and Appendix B of this plan and Appendix 3 of the Pattern book in Appendix A of this plan.
	55	All spoil disposal sites shall be designed, constructed and managed in accordance with the following: e. Contouring of all spoil disposal sites to visually integrate into the natural landform.	Refer to Section 4.2.6 of this plan.

	57	Each spoil site shall be stabilised and planted over including being grassed (non-invasive species) or re-vegetated with silver tussock to no less than 20% cover, as soon as practicable after it has been fully utilised, in order to prevent scour and avoid sediment being washed into adjacent watercourses. Stabilisation may be staged, and stabilised areas diverted to a clean water diversion, to maintain a suitably small working catchment area.	Refer Section 4.2.6 of this plan.
Rehabilitation of disturbed areas			
	60	Prior to undertaking any construction activities, the Consent Holder shall engage a suitable qualified and experienced ecologist to undertake a survey of the vegetation in the areas which are to be disturbed for construction purposes as detailed in 61. The results of this survey shall be provided to the Hurunui District Council.	This has been carried out as far as possible as part of the EMP and will be updated by the project ecologist when the final design footprint is complete.
	61	Site areas disturbed for pre—construction geotechnical investigations and construction purposes, but not necessary for the ongoing wind farm operation, being the concrete batching area, laydown areas, spoil disposal areas, road batters, and parts of turbine platforms, shall be rehabilitated progressively, and in any event within 12 months of the completion of construction in accordance with the Construction Management Plan. The objective shall be to rehabilitate those areas to a similar condition to the condition identified in the pre—construction survey required by condition [60], or as otherwise agreed with the Hurunui District Council.	Refer to rehabilitation plans in Appendix B of this document and construction sequence in shown in section 4.2.4
	62	Within 3 months of completion of the construction of the wind farm (including the rehabilitation required by condition [61]), the Consent Holder shall advise the Manager of Environmental Services of the Hurunui District Council in writing that all relevant conditions of this consent relating to construction activities have been complied with.	
Tussock Grassland Management			

	92	Where silver tussock is disturbed for pre-construction geotechnical investigations or construction purposes, but not necessary for the ongoing wind farm operation it shall be rehabilitated in accordance with condition [61] Rehabilitation of the area shall be to the standard identified in the preconstruction survey.	Refer Section 4.2.7 of this plan and section 2.1 in the pattern book
Visual Effects Mitigation Road construction mitigation and remediation			
	94	All surplus limestone and other excavated material shall be disposed of in locations indicated on the Golder Associates plans referred to in conditions [3] and [4] and Mt Cass Wind Farm plans referred to in condition [5].	Refer to 4.2.6 of this plan
	95	Areas containing spoil disposal and surplus earthworks shall be finished in accordance with conditions 31f and 31g	Refer to 4.2.6 of this plan
	96	Uphill edges of cut faces for roads built through Amuri limestone shall be finished in an irregular pattern.	Refer Section 4.2.4.2 of this plan.
	97	Straight line interfaces between cut faces and original surfaces shall be avoided.	Refer Section 4.2.4.2 of this plan.
	98	Cut faces in Amuri limestone shall be finished so as to emulate naturally occurring limestone faces. Techniques for this purpose shall reference naturally occurring patterns in local limestone faces and may include:	Refer Section 4.2.4.2 of this plan. Also 2.4.6 of the Pattern book in Appendix A of this Plan
	a	Cut faces shall be scarified to achieve a surface texture commensurate with naturally occurring surface textures in weathered Amuri limestone. Scarification shall be done with a tyned tool in the direction of the bedding plane or 'grain' in the limestone.	Refer Section 4.2.4.2 of this plan. Also 2.4.6 of the Pattern book in Appendix A of this Plan

	b	Continuous, sheer limestone cut faces shall be avoided through the creation of surface variations that emulate naturally occurring patterns. Shallow vertical and diagonal fissures, narrow rills and shallow pockets shall be cut into limestone faces in an irregular pattern at 3—5 m intervals.	Refer Section 4.2.4.2 of this plan. Also 2.4.6 of the Pattern book in Appendix A of this Plan
	c	In cuts over 2 m in height, shallow benches approximately 200-400mm deep shall be cut into the face at approximately 2 m (but irregular) intervals, parallel to the bedding plane or 'grain' of the rock. These benches will provide locations for the accumulation of sediments and the products of natural erosion, which will in turn form a substrate for the establishment of plants.	Refer Section 4.2.4.2 of this plan. Also, Fig 30 & 31 in section 2.4.6 of the Pattern book in Appendix A of this Plan
	99	During the construction of Northern Terrace Road and associated ramp roads to the main ridgeline, cut material shall not be side cast down-slope of the road, but shall be removed from the work areas and disposed of at disposal sites indicated on the Golder Associates Plans CG151.4-152.4 and Mt Cass Wind Farm plans 4755.1 and 4755.2 Rev B dated 4 May 2021.	Refer Section 4.2.4.1
	100	Mitigation techniques on the outside edges of roads referred to in Condition [0] shall include, but not be limited to, the following:	
	a	Where these roads are cut through Amuri limestone, at irregular intervals along the outer edges of roads, topsoil shall be removed from the edge of the road to expose patches of underlying limestone.	2.4.6 of the Pattern book in Appendix A of this Plan
	b	Indigenous tussock and grey scrub species shall be established sufficiently close to the outer edge of the road to grow above the level of the roads formation.	Fig 36 on page 38 of the pattern book.
	101	Limestone boulders within boulderfields derived from Weka limestone that will be displaced through the construction of the Northern Terrace Road and spur roads or displaced through stabilisation measures, shall be relocated locally in naturalistic patterns on the downhill side of the roads.	2.3.6 of the Pattern book in Appendix A of this Plan

		<p>To the extent practicable, boulders shall be located in ground to a similar depth and orientation as they were in their natural state.</p> <p>102 The finish of cut limestone faces and fill surfaces, the establishment of replicated boulder fields, the design of spoil disposal areas and the establishment of plants for mitigation and remediation shall be guided by the preparation (by the Consent Holder in consultation with the Hurunui District Council) of a site 'landscape pattern book' of graphic examples drawn from the locality. The pattern book will provide a source book of examples that should be used to guide the visual appearance of landscape mitigation and remediation works.</p>	
	102	<p>The finish of cut limestone faces and fill surfaces, the establishment of replicated boulder fields, the design of spoil disposal areas and the establishment of plants for mitigation and remediation shall be guided by the preparation (by the Consent Holder in consultation with the Hurunui District Council) of a site 'landscape pattern book' of graphic examples drawn from the locality. The pattern book will provide a source book of examples that should be used to guide the visual appearance of landscape mitigation and remediation works.</p>	Refer to Appendix A of this plan.

Landscape expert guidance and oversight			
	103	During excavation associated with the construction of roads, the construction of the fence required by condition [86(a)] on the northern side of the escarpment, and the implementation of landscape mitigation and remediation works, including the disposal of surplus material to spoil disposal areas, a landscape experts panel shall be available as necessary to provide guidance on the implementation of the landscape conditions described in this section. The panel shall be comprised of two landscape architects; one nominated by Hurunui District Council, and one by the Consent Holder.	MCWFL have formed the landscape panel. MCWFL Landscape Architect: Chris Glasson of Glasson Huxtable Landscape Architects HDC Landscape Architect: Nikki Smetham of Rough & Milne Landscape Architects Refer to section 7 of this plan.
	104	The landscape expert panel shall liaise with geomorphological, geotechnical and ecological experts as necessary.	MCWFL have formed the landscape panel. MCWFL Landscape Architect: Chris Glasson HDC Landscape Architect: Nikki SmethamRefer to section 7 of this plan.
Rehabilitation of visually prominent cut limestone surfaces			
	105	Within 3 months of the commencement of consent the Consent Holder shall commence a trial of methods for the remediation of freshly cut, un-weathered Amuri limestone surfaces to determine whether accelerated or simulated weathering can be achieved within a shorter time frame than that of natural biofilm establishment.	This has been completed and the outcomes included in the landscape pattern book on Page 42, section 2.4.6
	106	Methods for trialling shall be developed in consultation with the Hurunui District Council and the landscape panel referred to in condition [103], and may include:	The Landscape Panel recommendations following remediation trials indicated the methods for remediation would be incorporated in the Landscape Pattern Book. Refer App. 7 of MCWF Annual Environmental Report 2014.
	a	The application of organic materials to initiate natural biofilm colonisation; or	Refer to section 2.4.6 of the Landscape Pattern Book
	b	The application of organic or inorganic sprays for the purpose of temporary staining of freshly cut rock surfaces.	Refer to page 41 (VIII) of the Landscape Pattern Book

	107	<p>At the same time as providing the Hurunui District Council with the information required by condition 33, the Consent Holder shall notify the Council of the method that shall be used to remediate Amuri limestone at the site both immediately after cutting and in the long term, providing that any such method will not jeopardise the natural process of biofilm colonisation. The Consent Holder shall implement the identified method as soon as is practicable but no later than six months after cutting.</p>	<p>The planned limestone treatment is set out in the Landscape Pattern section 2.4.6</p>
Planting for mitigation and remediation of cut and fill batters			
	108	<p>Other than on cut limestone faces, cut and fill surfaces shall be rehabilitated in accordance with condition [61].</p>	<p>Refer Section 4.2.4 and 17 4.2.7 of this plan.</p>
	109	<p>Locations for the establishment of woody plants and silver tussock within the wind farm site for visual mitigation shall be determined through consultation between landscape and ecology experts nominated by Hurunui District Council and the Consent Holder. The location of mitigation planting shall take into account the effects arising as a consequence of visibility from important public viewpoints agreed upon by the landscape experts.</p>	<p>MCFWL have engaged RMA Ecology and Glasson Huxtable Landscape Architects</p> <p>A specimen design is included in Appendix B and the detailed design will be agreed once it is complete.</p>
	110	<p>The pattern of plantings undertaken for visual mitigation and remediation shall reflect natural patterns of plant distribution and association, as illustrated in the site landscape pattern book (see condition [102]).</p>	<p>The detailed design and Specification will be reviewed by RMA Ecology and the Landscape Panel. The Specimen design in Appendix B is approved in principle and will form the basis of the detailed design.</p>
	111	<p>The use of plants for mitigation and remediation of visual and landscape effects associated with cut and fill excavations shall be subject to</p>	<p>The detailed design and Specification will be reviewed by RMA Ecology and the Landscape Panel. The Specimen design in Appendix B is approved in principle and will form the basis of the detailed design.</p>

		conditions specified for habitat enhancement, ecological restoration and weed management.	

Table 1 Consent Conditions Relating to Landscape Management

3. Existing Project Site Conditions

The ridgeline feature between Mt Cass and Totara Peak is defined as an Outstanding Natural Feature as:

- the ridge is a fine example of a cuesta and is a geomorphological feature of regional significance.
- there are limestone ecosystem features include sinking streams, , caves, dry valleys, enclosed depressions, fluted rock outcrops, and springs.
- the Mt Cass-Oldham ridgeline and backslope exhibit a distinctive, potentially unique (within Canterbury) range of landforms and landscape elements.

Some of the windfarm earthworks will be visible from public viewpoints. For example, from SH1 and SH7 where the Northern Terrace Road and ramp roads are visible, and from the Mt Cass Road adjacent to Tiromoana Reserve, where the Southern Access Road is visible. Due to the natural features within the Project site and visibility of the works, landscape rehabilitation is required.

4. General Control Measures

4.1 Key Principles and Approaches

Landscape rehabilitation is proposed to ensure the landscape and visual impacts of the Project are minimised. Key principles to be followed are:

- Contouring of all areas of cut and fill to visually integrate into the natural landform including planting where necessary.
- Rehabilitation of all disturbed areas.

4.2 Specific Control Measures

Measures to rehabilitate the site to mitigate landscape and visual effects are described in the following sections.

4.2.1 Concrete batching plant

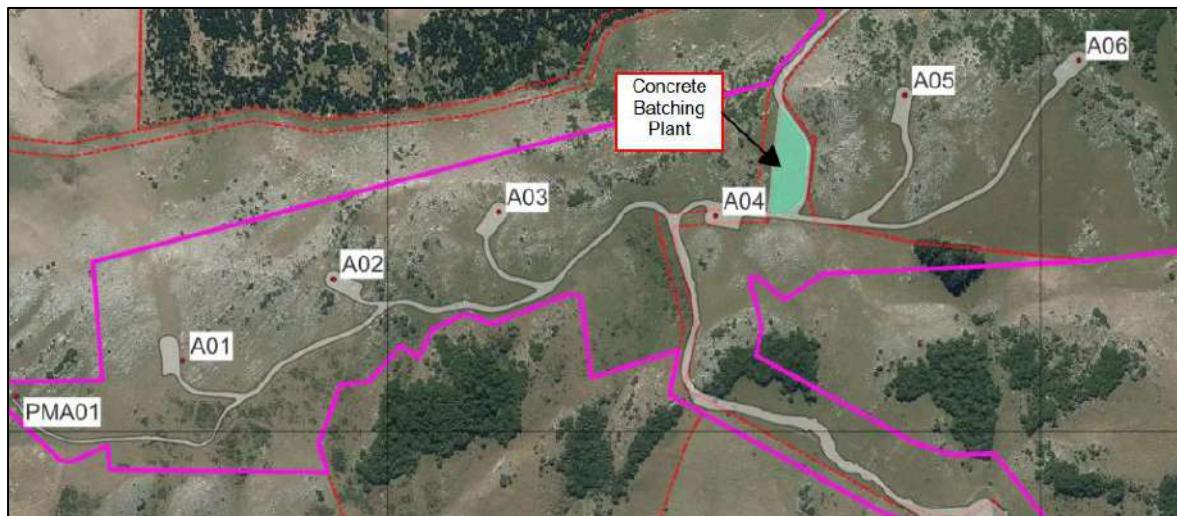


Figure 1 Concrete Batching Plant Location.

The concrete batching plant is required to be located at the top of the Southern Access Road as indicated in Figure 2 and is required to be removed within 6 months of completion of the wind farm construction. The area occupied by the concrete batching plant is to be rehabilitated to a similar condition identified in the pre-construction survey within 12 months of construction completion.

Figure 2 – Concrete Batching Plant Location

4.2.2 Record of disturbance areas

Site clearing will be restricted to areas of the Project site within the outline of the earthwork area to comply with the limits in Condition 13 of the HDC land use consent, which is shown in Table 2:

Ecosystem type	Limit
Exposed limestone disturbance (hectares)	
Pavement and boulder field	2.04
Pavement	0.89
Vegetation clearance (hectares)*	
Indigenous shrubland	0.71
Indigenous forest	0.08

Table 2 Condition 13 R90 Clearance Limits

*Refer to Sub Plan B9 Construction Ecology Management Plan for controls on Indigenous shrublands and vegetation.

To ensure that these disturbance limits are not exceeded, the design team will overlay the design model with the ecological survey data uploaded into a GIS map.

The mapping overlay will be completed once the design footprint has been finalised

The project team will conduct as-built surveys throughout the earthworks phase, which calculate the actual areas disturbed and report on them fortnightly to HDC per ecosystem type in table 2.

At the completion of construction, as built plans shall be provided and will be independently verified using an independent third-party and submitted to HDC.

4.2.3 Micro siting

MCWFL have carried out micro siting as part of the design phase of the project. Therefore, the only reason that a turbine foundation should have to be microsited is if ground conditions encountered were found to be unsatisfactory. – For example, if a tomo was found.

If micrositing is required, this will be reported to HDC and carried out within the conditions of the resource consent.

4.2.4 Rehabilitation

Areas disturbed during the construction of the Project are to be rehabilitated in accordance with the plans in Appendix B of this document.

The rehabilitation will be staged throughout the project to ensure that the timelines in the resource consent are met. A rehabilitation programme will be established once the detailed design is complete.

The maintenance of these areas will be allocated to the MCWFL operations team and sourced to experienced contractors.

Records of the rehabilitation are to be kept providing evidence of compliance to satisfy condition 62 of the HDC land use consent.

4.2.4.1 Earthworks Areas

All disturbed areas of the Project site not required to be used for the wind farm operation are to be rehabilitated progressively and within at least 12 months of the completion of construction. Glasson Huxtable Landscape Architects has prepared the Mt Cass Wind Farm – Pattern Book for Site Rehabilitation (Pattern Book) with input from MCWF, HDC and Dr David Norton – University of Canterbury Ecologist (School of Forestry). The Pattern Book is included in Appendix A and informs the methods to rehabilitate the site. The landscape rehabilitation design plans in Appendix B include details of the visibility impact for each section of the Project works and identifies the landscape rehabilitation works proposed to mitigate such effects.

By way of summary, the following types of landscape rehabilitation methods are proposed:

- Within grassland areas placing mounds on the downslope of parts of the alignment to obscure the alignment of roads and platforms.
- Creating textured surfaces along cut faces, screening with vegetation and varying the depth of cut to reduce views of straight cuts.
- Moving limestone boulders located within the alignment to the downslope of the alignment to be arranged in a naturalistic style and using stockpiled material to shape the area.
- Where batter slopes would be too steep, boulders are placed downslope of the alignment, ledges are to be formed to hold boulders in place.
- Amuri limestone surfaces are to be textured/cut irregularly to reduce the dominant cream colour characteristic and enable organic matter from the site to collect in cracks/crevices to allow vegetative matter to grow and reduce the visibility of cut material.
- Establishment of vegetation along the edge of the alignment in keeping with adjacent vegetation type and landscape.

- Cutting of benches adjacent to the road alignment and platforms where large cuts are required to enable the planting and natural establishment of vegetation on benches.
- When turbine construction is completed, portions of the gravel platform used during construction are to be removed, the ground scarified and soil placed in the area. Where platforms are adjacent to existing bush areas native shrubs will be planted in parts of the platform.

During the construction of the Northern Terrace Road which extends from the concrete batching plant to Turbine A15, the earthworks contractor is not allowed to side cast materials down slope and must excavate them into a truck and transport them directly to a consented disposal site.

4.2.4.2 Limestone Areas

Excavation of limestone rock is to be undertaken in accordance with landscape mitigation measures set out in the Pattern Book, including:

- Straight line interfaces between cut faces and original surfaces are to be avoided.
- Cut faces in Amuri limestone are to be finished to emulate naturally occurring limestone faces. Techniques for this purpose will reference naturally occurring patterns in local limestone faces.
- Cut faces are to be scarified to achieve a surface texture commensurate with naturally occurring surface textures in weathered Amuri limestone. Scarification is to be in the direction of the bedding plane or 'grain' in the limestone.
- Continuous, sheer limestone cut faces are to be avoided through the creation of surface variations that emulate naturally occurring patterns. Shallow vertical and diagonal fissures, narrow rills and shallow pockets will be cut into limestone faces in an irregular pattern at 3 to 5 m intervals.
- In cuts over 2 m in height, shallow benches approximately 200 to 400mm deep are to be cut into the face at approximately 2 m (but irregular) intervals, parallel to the bedding plane or 'grain' of the rock (note: this is unlikely to be parallel to the slope of the road). These benches will provide locations for the accumulation of sediments and the products of natural erosion, which will in turn form a substrate for the establishment of plants.

Areas where limestone pavement protection is required are identified on the design plans in Appendix B and both Section 2.6.6 and Appendix 2 of the Pattern Book. Prior to working in these areas, the earthworks subcontractor will need to issue a work pack for approval that demonstrates their construction method complies with these requirements.

4.2.5 Specific Protection of Limestone Pavement

Where the road on MC50 crosses the limestone areas, no equipment will be allowed to travel directly on top of the exposed rock. Fine aggregates will be tipped off prior to the area and pushed forward using a dozer to create the required road width. Works will progress forward using this methodology with trucks reversing along the alignment and tipping off at the tip head until the area is cleared. At no point will any heavy equipment be allowed to drive off the surface. The design will call for sufficient road pavement thickness so that when the aggregate is compacted it does not damage the limestone below.



Figure 3 – Section of limestone pavement on MC50

Similarly in areas of exposed limestone pavement encountered during the construction of fencing and walking tracks the use of wheeled and tracked vehicles driving on these areas will be explicitly forbidden.

4.2.6 Spoil Disposal Sites

All spoil disposal sites are to be located within the consented disposal sites identified on the design plans in Appendix B. Each site is to be designed, constructed and managed to ensure contouring to visually integrate into the natural landform. The following typical construction stages are to be followed at disposal sites:

- stripping of topsoil and soft materials from the surface to be stockpiled for later use
- benching of slopes and installation of subsurface drainage where required
- compaction of spoil and arrangement to appropriate surface level
- cover with topsoil and vegetate with suitable ground cover.

Refer Section 2.7.3 of the Pattern Book in Appendix A for rehabilitation of spoil disposal sites.

Each spoil site is to be stabilised and planted over including being grassed (non-invasive species) or re-vegetated with silver tussock (for selected sites) to no less than 20% cover, as soon as practicable after it has been fully utilised, in order to minimise erosion and sediment risks.

4.2.7 Planting

Areas where trees and vegetation are proposed to be planted are identified on the design plans in Appendix B and are in areas where roads and turbines will be more visible from off-site locations.

Planting mitigation measures are described in the Pattern Book in Appendix A and in summary include:

- replanting of silver tussock through direct vegetation transfer or other appropriate method in areas where silver tussock has been identified with a median greater than 10% density
- revegetation is to be with locally eco-sourced indigenous species and non-invasive, low stature grasses such as perennial ryegrass (*Lolium perenne*) and annual poa (*Poa annua*) grass species only.
- No aggressive exotic grasses such as browntop (*Agrostis capillaris*), cocksfoot (*Dactylis glomerata*) and brome (*Bromus spp.*) are to be used.
- In open pasture areas, over sowing of grass seed will occur using a mix of short rye, fescue and NZ browntop.
- Planting of *Poa cita* is required where tussock has been damaged or removed.
- Areas of planting are to follow current and natural patterns of the site area with planting areas fenced off to assist with survival.
- The types of species to be planted are set out in Appendix 1 Sections 1.4 to 1.7 of the Pattern Book.

To date geotechnical investigations have been completed within the construction footprint to mitigate the need to plant disturbed areas. Should further investigations be required then this will be the method employed.

4.2.8 Operations and Maintenance Area

Landscaping is proposed around the Operations and Maintenance Area (O&M) with amenity planting of trees and shrubs around the front of the O&M Area and revegetation planting in zones of trees and shrubs uphill of the buildings and down slope of the road. The Landscape Plans for the O&M Area are included in Appendix C.

4.2.9 Fencing

At the time of drafting this plan the site fencing and walking track are still under design. Once designed the final alignment will be issued to HDC with the pre-construction plan prior to construction taking place.

The fencing contractor will be engaged by the Civil Contractor and the terms of their subcontract will tie them to meeting the resource consent requirements.

Prior to building the fences a work pack will be issued by the subcontractor and reviewed by the projects management. This document will require specific controls and methods that prevent the use of wheeled and tracked machinery on in situ limestone pavements and any other methods to minimise the disturbance to the limestone surface.

4.2.10 Unsafe Boulder Procedures

Where boulders are identified as a geohazard and require relocation for the safety of the project the project team will develop a work plan in conjunction with the MCWFL Ecologist and Karst expert to relocate it safely while minimise any visual effect and disturbance.

The general mitigations will be as described in section 2.3.6 of the Pattern Book.

5. Training – On-site Personnel

All staff working on the contract will be suitably experienced and competent for the tasks they are assigned to perform. This training will be a mixture of formal qualifications and onsite training depending on the persons role on the project, requirements by their employer and compliance with relevant legislation.

Training and awareness programmes are critical to ensuring that there is an appropriate level of environmental and sustainability knowledge for those staff and subcontractors involved in the project.

Training of site staff will be provided through project inductions, weekly toolbox talks, information posters such as spill response plans and any site-specific training considered necessary.

Notice boards will include environmental information including EHS Alert and relevant updates.

All staff and subcontractors will be inducted to the site prior to starting works. This induction will include the items identified in the training matrix in Table 3 below that are specific to this management plan and are specific to the persons role on the project. A full training matrix is located in the CMP.

Mt Cass Windfarm Training Matrix						
Training Area	Construction Worker	Machine Operator	Management	Fire Response Team	Enviro Team	Visitor
Rehabilitation	<p>Landscape Management Plan Awareness</p> <p>The requirements of the landscape rehabilitation handbook.</p> <p>least impact techniques when disturbing or clearing limestone</p> <p>Methods for working on limestone pavements</p> <p>Limits of disturbance and reporting requirements</p>	<p>Landscape Management Plan Awareness</p> <p>The requirements of the landscape rehabilitation handbook.</p> <p>least impact techniques when disturbing or clearing limestone</p> <p>Methods for working on limestone pavements</p> <p>Limits of disturbance and reporting requirements</p>	<p>Landscape Management Plan Requirements</p> <p>The requirements of the landscape rehabilitation handbook.</p> <p>least impact techniques when disturbing or clearing limestone</p> <p>Methods for working on limestone pavements</p> <p>Limits of disturbance and reporting requirements</p>	N/A	<p>Landscape Management Plan Awareness</p> <p>The requirements of the landscape rehabilitation handbook.</p> <p>least impact techniques when disturbing or clearing limestone</p> <p>Methods for working on limestone pavements</p> <p>Limits of disturbance and reporting requirements</p>	N/A

Table 3 Landscape Rehabilitation Training Matrix

6. Monitoring and Maintenance During Construction

As part of the control measures, on-going site monitoring by the contractor and wider project team will be undertaken. This will ensure that all the control measures detailed in this plan have been properly implemented and are functioning effectively.

Monitoring shall occur for the full duration of the works to identify areas of planting that require attention or support to survive. Any control measures requiring maintenance or adaptation to allow construction tasks to occur shall be identified and implemented by the Environmental Advisor to ensure continual compliance.

7. Roles and Responsibilities

Role	Role Responsibilities
Construction Manager	<p>Has ultimate responsibility for this plan.</p> <p>Is to engage suitable specialists to carry out the requirements of this consent and report to HDC and ECan.</p> <p>Running the permit to work system for the Mt Cass Construction Zones and ensuring that all ecological requirements are completed prior to issuing permit to work.</p> <p>Reporting to the regulator</p> <p>Have regard to any advice received from the ecologist and the expert on karst landscapes during micrositing and provide a report to HDC if unable to meet this advice.</p> <p>Appoint the Landscape Panel</p>
Environmental Advisor	<p>Reviewing and reporting on environmental performance.</p> <p>Inspection of works to assess compliance with the management plans.</p> <p>Inspections, auditing and checking of environmental management practices and procedures.</p> <p>Responds to and investigates all environmental complaints, issues or incidents.</p> <p>Responsible for on-site compliance with consent conditions and other requirements and tracking compliance information.</p> <p>Notifies the Construction Manager and Regulatory Authorities of any significant non compliances.</p> <p>Report to the Construction Manager changes to construction techniques or natural environmental changes which require alterations to existing consents or require new resource consents.</p> <p>Update and maintain the environmental portion of the Project Risk Register.</p> <p>Training of all staff including subcontractors on the ecological management requirements.</p>
MCWFL Specialists	Responsible for providing advice if micro siting is required.

A suitably qualified and experienced expert in karst landscapes	<p>Provide training to key Project team members on technical aspects of meeting this plan.</p> <p>Provide information for site inductions to help inform site team on meeting this plan.</p>
Landscape Panel	<p>Advise the project team on landscape issues to ensure compliance with the consent.</p> <p>Liaise with geomorphological, geotechnical and ecological experts as necessary.</p> <p>Review detailed design drawing and specifications</p>
<p>Construction team</p> <ul style="list-style-type: none"> • Contractors Project Manager • Civil Contractor PM 	<p>Overall responsibility for ensuring this Plan is correctly implemented for their section of work.</p> <p>Responsible for ensuring that their personnel are suitably trained in the requirements of this plan.</p> <p>Reports all ecological incidents and complaints to the Environmental Manager.</p> <p>Ensure that permits to work are issued for their relevant scope.</p> <p>Carrying out fortnightly surveys of disturbed locations and issuing results to MCWFL.</p> <p>Ensure that detailed design meets the requirement of this plan</p> <p>Review construction work packs and ensure that they meet the requirements of this plan.</p>

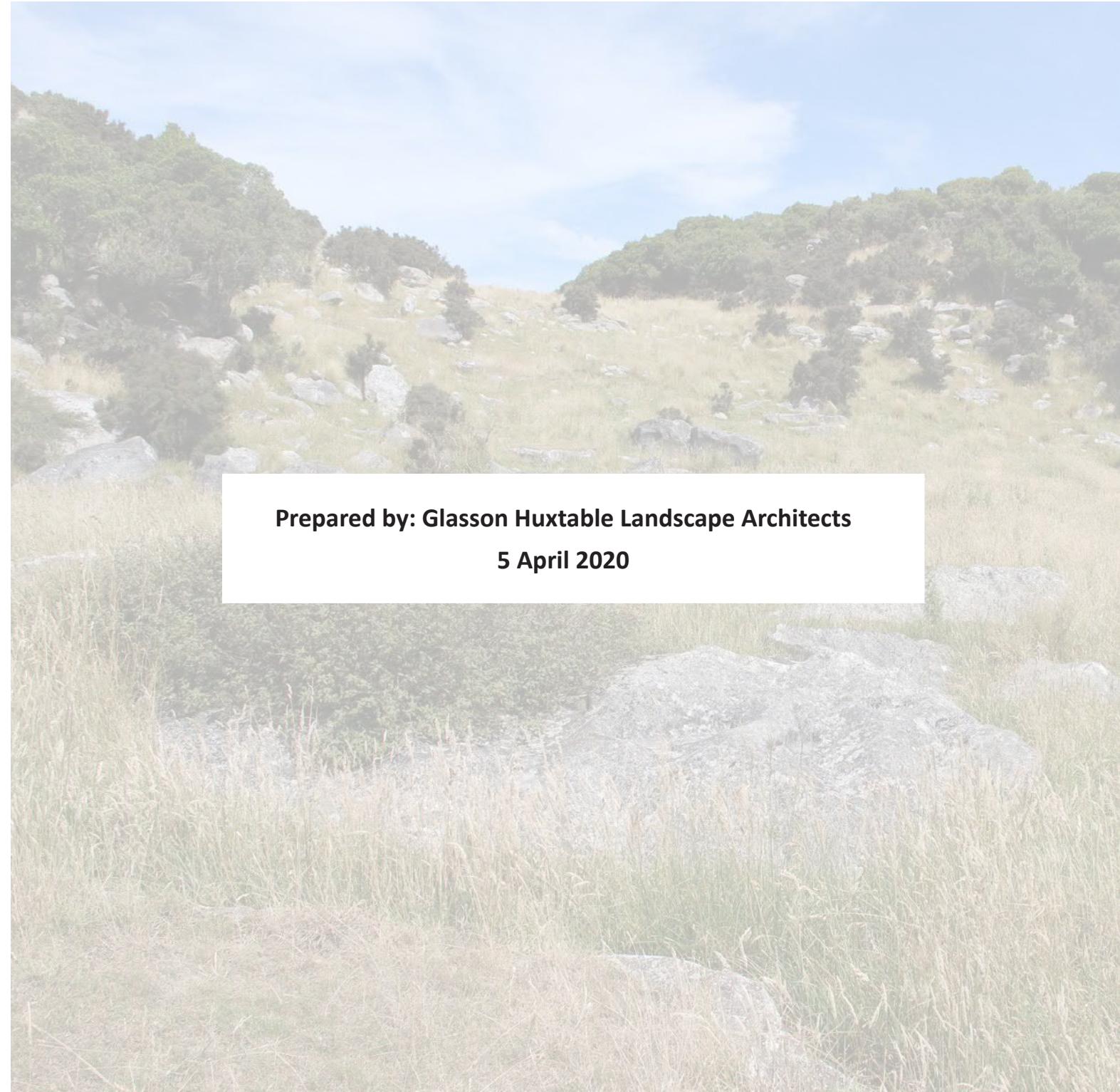
8. Appendices

Appendix	Description
A	Mt Cass Wind Farm – Pattern Book for Site Rehabilitation
B	Landscape Rehabilitation Plans
C	Operations and Maintenance Building Landscape Plans

APPENDIX A – Pattern Book for Site Rehabilitation

Mt Cass Wind Farm - Pattern Book for Site Rehabilitation



A scenic view of a hillside covered in green vegetation and rocks under a blue sky. The hillside is covered in green grass and small shrubs, with many large rocks scattered across the slope. The sky is blue with some white clouds.

Prepared by: Glasson Huxtable Landscape Architects
5 April 2020

Mt Cass Wind Farm: Pattern Book



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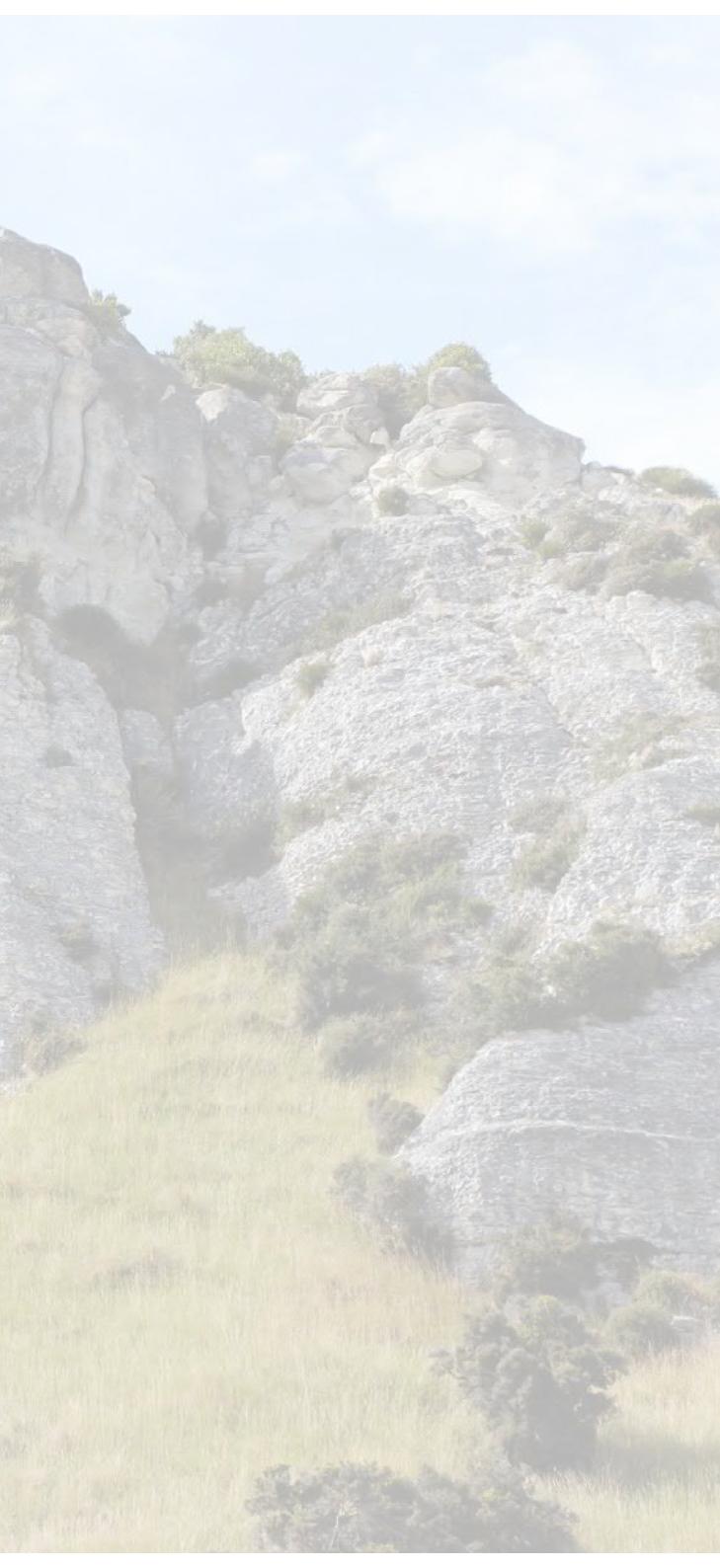
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List of Abbreviations

CoC	Conditions of Consent
EMP	Environmental Management Plan
HDC	Hurunui District Council
NTR	North Terrace Road
ONL	Outstanding Natural Landscape
PB	Pattern Book
SAR	Southern Access Road
SH1	State Highway One
SH7	State Highway Seven



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Introduction



1.1. Purpose

The conditions of consent (CoC) for the Mt Cass wind farm require methods to mitigate the landscape and visual effects occurring due to engineering solutions for components of the windfarm. To achieve these requirements, a panel of two landscape architects representing Hurunui District Council and Mt Cass Wind Farm Ltd have compiled this Pattern Book.

The Pattern Book is a guide for the civil designer for how the landscape mitigation will occur on the site in different situations. As such, it contains a set of guidelines for contractors to adhere to when undertaking the implementation of the wind farm.

The pattern book provides:

Guidance for rehabilitation and visual mitigation of the North Terrace Road (NTR), Southern Access Road (SAR), ramp roads, disposal areas, laydown areas, and turbine platforms. (refer to the 'Map: Zones of Landform and Landcover' plan for the location of these areas). The PB applies to areas both inside and outside of the conservation management area but includes all civil works onsite.

The PB is the result of liaison between Mt Cass Wind Farm Ltd. and the HDC regarding suitable methods of rehabilitation and visual mitigation. Other relevant disciplines (e.g.: geomorphologists, ecologists and project engineers) have been consulted and provided input into the PB as required to ensure consistency with the Environmental Management Plan (EMP) and engineer construction drawings. (CoC 104)

This is an initial document and it is anticipated that there will be ongoing discussions between the designers and contractors during the design phase. As

part of the construction process the project landscape architect, Chris Glasson of Glasson Huxtable and the HDC representative landscape architect (Nikki Smetham of Rough & Milne) shall:

- Undertake site visits when necessary, at any stage of the project including construction phase.
- Liaise with the project manager and make on-site decisions where necessary during the construction phase.
- Provide written reports to HDC and Mt Cass Wind Farm Ltd. regarding on-site decisions.
- Peer review civil design in accordance with the PB.

The above input is in accordance with the CoC (103-104).

At the time of preparing the PB, the engineering and architectural plans and details had not been prepared. The PB is a conceptual guideline for the engineering designers and contractors, it is not a specification document and as stated earlier, it shall be used in conjunction with ongoing collaboration between the designers and contractors during the design phase.

The construction of the NTR and ramp roads, and to a minor degree the disposal sites, batching areas and turbine platforms will require various combinations of cuts (including short sections of box cuts), cut and fill, and areas of fill. The limestone outcrops close to the existing farm tracks indicate the topsoil is a relatively thin veneer and the proposed cuts are likely to expose fresh and un-weathered limestone.



Purpose (continued)

With regard to earthworks for roading rehabilitation, the plans indicate that cuts are typically up to 5-6m, but in places there may be cuts up to 12 m in height. Downhill of the NTR, below Mt Cass, are filled areas of up to 10 m height. The base of the fill will be 40 m along the length of the road.

It is the cut faces and the constant gradient line of the roads across the face of the slopes that have the most potential for significant adverse effects. This is exacerbated by a margin of uncertainty regarding the exact nature of the substrate that will be encountered during the construction of the NTR and ramp roads where they cross the scarp face and ridgeline. Where the road or platform cuts intrude into limestone base rock, then effects are likely to be significantly more visible than if the cuts are into fractured rock and soil.

Some of the windfarm earthworks will be visible from public viewpoints. For example, from the SH1 and SH7 where the NTR and ramp roads are visible, and from the Mt Cass Road adjacent to Tiromoana Reserve, where the SAR is visible. Therefore, it is important to reduce any landscape and visual impact as much as possible by applying the measures outlined in the PB. (See Introduction, Table 1: Viewpoints and 1.4.2 Viewpoints Map).

In areas where the roads and turbines will be more visible from locations off site, mitigation planting treatment is to be focussed in order to lessen the visual impact for those off site. These areas are identified on 1.5 Visibility Map.

As well, the area of forest and pavement form part of an outstanding natural landscape (ONL), giving status to the high quality of the Mt Cass landscape. This means that any development on, or in the vicinity of the ONL, should be undertaken to maintain ONL values.

1.2 Structure

The PB has been organised according to the differing landform and landcover types across the site. Each type has been described and the landscape and visual effects assessed, with mitigation measures applied in order to gain an acceptable outcome. This provides a consistent approach to the landscape mitigation, but with a consequence that some repetition will occur where similar treatments are used in different landforms.

1.3 Map: Landform and Landcover Character

