Mt Cass Wind Farm

Erosion and Sediment Control Plan

Revision 8 – 22 July 2026

Revision History

Version	Description	Date	Prepared by	Approved by
Rev 1	Draft	03 Mar 21	HW	SB
Rev 2	Draft	19 Apr 21	HL, SS	SB
Rev 3	IFC	1 Dec 22	BT	MC
Rev 4	MCD Amendments post review comments	22 Dec 22	BT	MC
Rev 5	MCD Amendments post review comments (second round)	14 Feb 23	BT	MC
Rev 6	MCD updated last 4 comments from SEQP	13 Oct 23	DK	MC
Rev 7	Final Version (following ECan feedback)	13 Oct 23	MC	GG
Rev 8	Annual Review – New ESCP developed	22 Jul 2026	LB	JC

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Acronyms

CMP	Construction Management Plan
CTP	Chemical Treatment Plan
CW	Clean water (stormwater outside the project corridor)
DEB	Decanting Earth Bund
DW	Dirty Water (stormwater in the project corridor)
ESC	Erosion and Sediment Control
ESCP	Erosion and Sediment Control Plan
ECan	Environment Canterbury
ESCT	Environment Canterbury's Erosion and Sediment Control Toolbox
MCWF	Mt Cass Wind Farm
SSESCP	Site Specific Erosion and Sediment Control Plan
SSF	Super Silt Fence
SRP	Sediment Retention Pond
Taylors	Taylors Contracting Ltd
The Project	Mt Cass Wind Farm
TSS	Total Suspended Solids

1 Introduction

The ESCP provides the project-wide framework for managing erosion and sediment during the construction phase of the Mt Cass Wind Farm to:

- Demonstrate how the conditions of the applicable resource consents are met
- Establish the principles, methodologies, and management framework that apply across the project
- Provide the basis for development of Site Specific ESCPs (SSESCPs)

The ESCP forms part of the Construction Management Plan (CMP) and must be read in conjunction with it. The project description, roles and responsibilities and complaint procedures are contained in the CMP.

1.1 Scope

The ESCP applies to all construction-phase activities within the consented footprint and covers earthworks, stormwater management and sediment control. It defines requirements for SSESCPs, which provide detailed, catchment-level design and staging.

Operational phase activities are not within the ESCP scope.

2 Resource Consent Requirements

The ESC is managed by the following resource consents:

Table 1: Relevant resource consents

Resource Consent	Activity	Expiry	Consent Authority
CRC264960	To use land for earthworks and vegetation clearance in erosion prone areas	14/07/2031	ECan
CRC264961	To discharge contaminants and construction-phase stormwater to land and to discharge water within 100 metres of a natural wetland.	11/11/2031	ECan
RC260077	Land use consent	N/A	HDC

Resource consent CRC264961 specifies requirements for the ESCP and SSESCPs.

Table 2: ESCP & SSESCP Resource Consent Requirements

Condition	Requirement
13	*The discharges authorised under Condition 1 shall occur in accordance with an ESCP and a SSESCP. The ESCP and any SSESCP shall:* *a. Detail best practicable erosion and sediment control measures that will be taken to ensure compliance with this resource consent.* *b. Be prepared by a suitably qualified person with experience in erosion and sediment control in accordance with:* *i. Environment Canterbury's Erosion and Sediment Control Toolbox (ESCT), which can be accessed under http://esccanterbury.co.nz/; or* *ii. An equivalent industry guideline. If an alternative guideline is used, the ESCP shall provide details of the relevant alternative methods used and an explanation of why they are more appropriate than the ESCT.* *c. Be certified by an independent, suitably qualified and experienced certifier/auditor with experience in erosion and sediment control, in accordance with condition (14), confirming that the erosion and sediment control measures for the site are appropriately sized and*

Condition	Requirement
	located in accordance with the ESCT and meets the requirements of conditions (16) and SSESCP.
14	*Within three months of the date of the grant of this resource consent, the Consent Holder shall provide to ECan information to demonstrate that the proposed certifier/auditor(s) of the:* *a. ESCP;* *b. SSESCP; and* *c. Control measures on site to ensure that the erosion and sediment control measures are being constructed and maintained in accordance with the ESCP* *is independent, suitably qualified and has experience in erosion and sediment control. If ECan does not approve the person(s) proposed by the Consent Holder, reasons should be provided to indicate why the person(s) is not considered suitable.*
15	*The independent approval required by condition (13)(c) shall be provided to ECan at least one month prior to the commencement of construction at the site.*
16	*The ESCP shall:* *a. Include a map showing the location of all works, including an earthworks staging plan and the maximum area of disturbance for each stage;* *b. Detail how best practicable measures are taken to minimise discharges of construction-phase stormwater run-off beyond the boundaries of the site;* *c. Include a programme of works, including a proposed timeframe for each stage of the works and the earthworks methodology;* *d. Detail the management of any stockpiled material;* *e. Detail methods to minimise disruption and interruption to the natural drainage pattern;* *f. Methods to minimise the amount of sediment that is discharged as a result of construction works into subterranean karst features and the water courses, both surface and subsurface, that drain the site;* *g. Detail inspection and maintenance of the sediment control measures;* *h. Detail sampling procedures and protocols as set out in conditions (29) of this resource consent;* *i. Detail the methodology for stabilising the site if works are abandoned; and* *j. Detail the methodology for stabilising the site and decommissioning erosion and sediment control measures after works have been completed.* *k. Include measures such as a Chemical Treatment (CTP) should the use of water treatment chemicals be required.*
17	*The consent holder may make any reasonable amendments to the ESCP at any time. Any changes to the ESCP shall be:* *a. For the purpose of improving the efficacy of the erosion and sediment control measures, and shall not result in reduced discharge quality;* *b. Consistent with the conditions of this resource consent; and* *c. Certified by the agreed independent certifier(s), as per the requirements outline in condition (13)(c).* *The consent holder shall provide a copy of any such amendment to the ESCP and the certification to Canterbury Regional Council, Attention: Regional Leader – Monitoring and Compliance, prior to giving effect to the amendment.*
18	*SSESCPs shall be prepared for each catchment where construction works are proposed and shall include:* *a. Detailed plans showing the location of sediment control measures, on-site catchment boundaries, and sources of runoff;*

Condition	Requirement
	b. Confirmation that the erosion and sediment control devices have been sized appropriately in accordance with the ESCT; *c. Drawings and specifications of designated sediment control measures;* *d. Details of any stockpiling locations within the catchment and the erosion and sediment control measures to minimise construction-phase discharges from the stockpiles;* *e. Detail methods to minimise discharges into exclusion zones identified on Plans CRC214152B and CRC214152C, attached to and forming part of this consent; and* *f. Define the discharge points where construction phase stormwater is discharged to waterways within the site.* *g. Measures such as a Chemical Treatment Plan (CTP) should the use of water treatment chemicals be required.* *The CTP must include, but not be limited to, the following information:* *h. Consideration of a broad range of water treatment chemicals available and appropriate for local site and soil conditions;* *i. Bench testing requirements to determine the optimal dosing rates of treatment chemicals, including:* *i. Details of optimum dosage (including assumptions); and* *ii. Results of the initial bench testing trials to show the water treatment chemicals that are most effective for the site soil conditions;* *j. Specific design details of the water treatment chemical application system.* *k. Monitoring (including but not limited to pH and the active ingredient content of the discharged water and any necessary laboratory testing of the samples), maintenance (including post-storm) and contingency programme (including a record sheet);* *l. Procedure for the onsite storage and transport of water treatment chemicals; and* *m. A spill contingency plan.*
19	*Each SSESCP shall be certified by the independent, suitably qualified person(s) (approved by Regional Leader – Monitoring and Compliance as being competent and suitable to provide such certification as per condition (14)) that it is prepared in accordance with the ESCP.* *If changes are required by the certifier these changes shall be made before the certification is confirmed. Documentation of the certification shall be maintained and provided to Canterbury Regional Council, Attention: Regional Leader – Monitoring and Compliance on request.*

3 ESCP & SSESCP Review & Certification

3.1 ESCP

This ESCP is a live document and may be reviewed and amended as required to improve the effectiveness of erosion and sediment control measures, and to ensure ongoing compliance with resource consents.

The ESCP may be amended to:

- Improve the effectiveness of erosion and sediment control measures
- Respond to site conditions, staging changes, or construction methodologies
- Address monitoring results, audit findings, or identified deficiencies

Any amendments to the ESCP shall:

- Be consistent with the conditions of the resource consent
- Not result in a reduction in discharge quality or environmental performance
- Be certified by the approved independent suitably qualified person (SQEP)
- Be provided to ECan and HDC prior to implementation

3.2 SSESCPs

SSESCPs provide the detailed, site-specific information required to implement the erosion and sediment control strategy at an operational level. They form an integral component of the overall erosion and sediment control framework and must be implemented in conjunction with this ESCP.

Each SSESCP:

- Applies to a defined catchment or work area
- Translates the ESCP framework into specific, implementable controls
- Ensures that runoff from disturbed areas is appropriately contained, treated and discharged
- Specifies the size, location, installation and maintenance of ESC measures

Each SSESCP is prepared and certified in accordance with Conditions 18 and 19 of CRC264961.

SSESCPs may be updated to reflect changes in staging, site conditions or effectiveness of ESC measures. Major revisions must be certified by the SQEP. Minor changes will not be certified, but will be documented in the SSESCP and include (but not limited to):

- Repositioning bunds, silt fences, DEBs, SRPs where catchment size is not increased by more than 10% and the device meets ESCT guidelines.
- Changing the sizing and/or dimensions of a SRP or DEB within the ESCT guidelines.
- Areas disturbed under a “cut and immediately cover” methodology outside of existing controls <750 m². There must be materials and resource on site that demonstrates a commitment to achieving this.
- The installation of additional controls where the approved control is not removed.
- Replacement of a bund with a silt fence or vice versa.

Major changes include but are not limited to:

- Devices that are non-standard

- Removal of a SRP or DEB
- Removal of an internal bund that separates or splits a catchment
- Removal of a treatment device and increasing the size of other devices to service the catchment
- Change of an offline culvert methodology to online

A copy of the original SSESCP document and subsequent versions will be archived within the project records. Any updated version of the SSESCP documentation will be issued with a version number and date to ensure the current SSESCP revision is used. Reasons for making changes to the SSESCP will be documented within Taylors' document management system. Taylors will submit any major amendments of the SSESCP and accompanying documents to the Client and SQEP for approval, as required.

4 Project Description

4.1 Project Overview

Refer to the CMP for the project description and a map of the project site.

4.2 Construction Activities & Programme

Construction includes the following high-level activities:

- Earthworks (cut/fill, topsoil stripping)
- Road construction
- Wind turbine hardstand construction
- Spoil disposal

Construction will occur in a linear and progressive manner from the site entrance, up and along the ridge including:

1. Installation of sediment control measures in sequence with earthworks.
2. Earthworks for the access road and the construction area facilities.
3. Earthworks for, and construction of roads and wind turbine platforms.
4. Spoil disposal areas close to the current earthworks work front.
5. Upgrade Forest North Road within Kate Valley landfill and a 120m section of Mt Cass Road between the landfill exit and the site entrance for transport of turbine components.
6. Underground electrical cable installation
7. Substation construction (note transmission line construction is outside this project scope and sits with MainPower NZ Ltd).
8. Turbine foundation construction progressively following earthworks.
9. Turbine erection progressively following foundation and roading construction.
10. Progressive commissioning.

The detailed activities and staging including disturbed land areas are described in the SSESCP's.

5 Roles and Responsibilities

Refer to the CMP for roles and responsibilities.

6 Erosion and Sediment Control Strategy

6.1 Management Approach

Erosion and sediment control management will be aligned with ECan's Erosion and Sediment Control Toolbox (ESCT) where relevant and take a best practicable option (BPO) approach.

Controls that do not meet ESCT guidelines may be used where they are a suitable option for the specific situation.

An adaptive management approach is applied to all ESC activities to ensure that measures remain effective.

6.2 Key Principles

The key principles of erosion and sediment control are to undertake land-disturbing activities in a manner that reduces the potential for erosion of bare soils (erosion control) and to employ treatment devices to treat sediment-laden water prior to discharging runoff from the site (sediment control).

These are summarised below:

- Minimise disturbance
- Stage works
- Protect slopes, waterways and karst
- Stabilise exposed areas quickly
- Consider weather conditions
- Utilise perimeter controls and diversions
- Utilise a variety of sediment control tools
- Adjust the plan as needed
- Monitor and adjust tools
- Suitable training and experience

6.3 Mt Cass- Specific Considerations

The site has several characteristics that must be considered in the management approach, including steep topography, high visual amenity and ecological values and severe constraints on available work areas. Competing tensions related to these factors must be balanced with the erosion and sediment control management approach to meet all resource consent requirements.

To inform the management approach, all parties[1] have discussed and agreed on a philosophy of exploring innovative, pragmatic, and low impact ESC controls. The primary purpose of this approach is to focus on minimising disturbance to the landscape and recognising that compliance points are somewhat distant from the works area. Methodologies employed at MCWF include:

- Minimising the exposed area by stabilising quickly. Open disturbance areas will be minimised to approximately 3000 – 5000m^2 (culvert to culvert) as far as practical and stabilised by forming the road surface and hydroseeding or applying mulch.
- Combine construction phase ESC controls (i.e. sediment traps and energy dissipation features) into the operational stormwater drainage design to avoid unnecessary soil disturbance.

[1] MCWFL, ECan compliance monitoring staff and Stantec (as the suitably qualified independent expert).

- Avoid the construction of clean water diversion channels on steep slopes (particularly above the access road) to minimise disturbance.
- Utilise large areas of established grass to treat sediment laden runoff as opposed to stripping topsoil to construct dirty water channels to concentrate runoff to large (Sediment Retention Ponds (SRP's).
- Utilise natural overland flow paths to accommodate in-situ / channelised flocculation closer to source with the use of K-Log (sediment control devices as opposed to conventional SRP's.
- Utilise treatment trains of multiple devices where relevant.
- Direct water away from exclusion zones where practical.

7 Waterways

There are no permanently running watercourses crossing the site, although there are several gullies that could flow with consistently high rainfall. The waterways that meet the definition of river or natural wetland within the project site are identified in Figures 1 and 2.

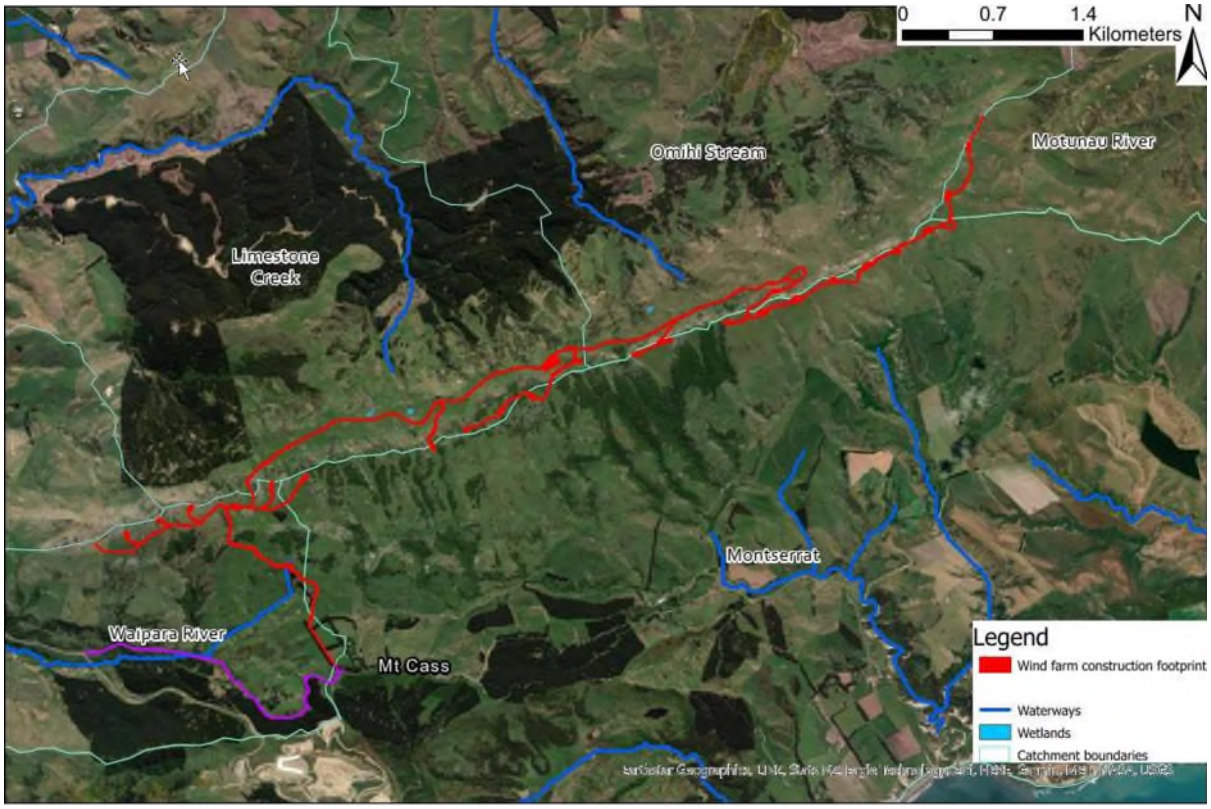

Figure 1: Waterways near the project site

Stormwater may be discharged within 100m of the two wetlands located adjacent to Road 22, as authorised by CRC264961. In accordance with Condition 6, this discharge will be subject to the following controls:

- *Water collected from disturbed areas shall be directed via cutoff drains to a decanting earth bund or a sediment retention bund to remove sediment and then to be discharged to vegetated areas within the same wetland catchment via level spreaders to diffuse flow; and*
- *Water from overland flows above disturbed areas shall be collected and diverted around disturbed areas prior to discharge to vegetated areas within the same wetland catchment using level spreaders.*

The specific controls to be used will be identified in the relevant SSESCP.

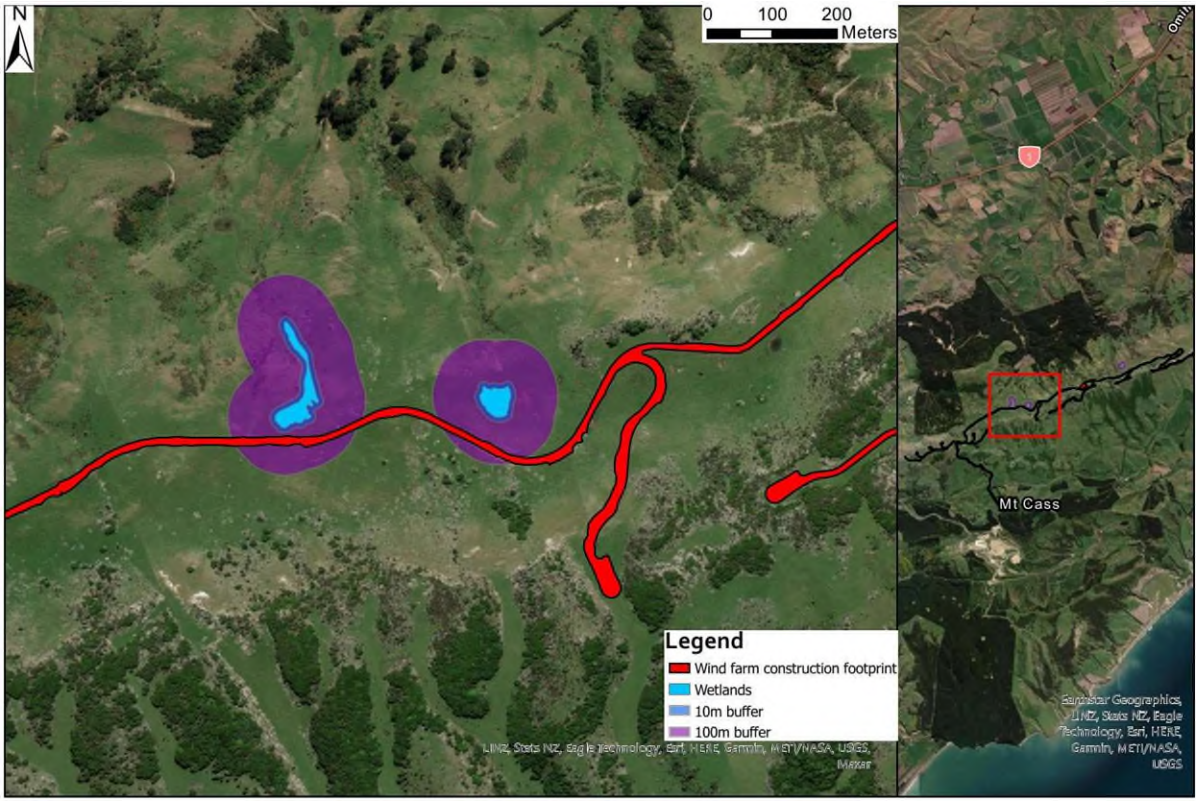

Figure 2: Wetlands within 100m of construction

8 Drainage and Runoff Management

8.1 Clean vs Dirty Water Separation

Clean water runoff from undisturbed areas will be diverted away from construction areas, where practicable by using cut-off drains and diversion bunds. Dirty water runoff from disturbed areas will be contained and directed to appropriate sediment control and treatment devices.

Due to the steep topography and scale of the Mt Cass site, full separation of clean and dirty water is not always practicable. In such situations, combined flows will be managed through a treatment train approach, including in-channel sediment controls and chemical treatment where required, prior to diffuse discharge to vegetated areas. This approach reflects a best practicable option, balancing erosion risk, constructability, and environmental outcomes, and is consistent with the ECan ESCT.

Figure 3: Steep slopes above and below the access road

8.2 Stormwater Management Design Philosophy

Stormwater management prioritises the minimisation of sediment generation at source and the treatment of sediment-laden runoff prior to discharge.

The design philosophy emphasises diffuse discharge of treated stormwater to vegetated areas, utilising natural filtration and infiltration processes, rather than reliance on large-scale centralised sediment control devices.

Erosion and sediment control measures are applied using a treatment train approach, incorporating source controls, flow conveyance, sediment retention devices, and chemical treatment where required.

Due to the steep topography, scale of the site, and the presence of sensitive karst features, conventional stormwater management approaches (such as extensive clean water diversion or large sediment retention ponds) are not always practicable. In these situations, stormwater management is adapted to suit site-specific conditions and detailed in the SSESCPs.

8.3 Design Storms

Stormwater management and erosion and sediment control measures for the construction phase have been designed using rainfall intensities derived from NIWA's High Intensity Rainfall Design System (HIRDS).

Erosion and sediment control devices are generally designed to accommodate a 1 in 20 year (5% AEP), 10-minute duration storm event, representing an appropriate balance between environmental protection and the temporary nature of construction works.

Higher levels of service are applied to critical control structures, such as sediment retention ponds and decanting earth bunds, which are designed to safely manage larger storm events, including provision for emergency overflow.

Permanent stormwater infrastructure, including road drainage and culverts, is designed to a higher standard (typically up to a 1 in 50 year event), reflecting long-term performance requirements.

For rainfall events exceeding the design capacity of erosion and sediment control measures, an adaptive management approach is adopted. This includes implementation of additional controls, use of flow dispersion to vegetated areas, and reliance on natural drainage pathways to minimise environmental effects.

Design flows for individual control measures are determined on a catchment basis using the rational method, with runoff coefficients adjusted to reflect site conditions including soil type, slope, and level of disturbance.

9 Erosion and Sediment Control Measures

Erosion and sediment control (ESC) measures focus on minimising erosion at source and progressively stabilising exposed areas.

ESC measures are applied in accordance with a hierarchy that prioritises:

- Avoidance and minimisation of disturbance
- Erosion control measures to prevent sediment mobilisation
- Sediment control measures to capture runoff
- Enhanced treatment where required

A treatment train approach may be adopted, where multiple controls are used in sequence to manage runoff and achieve the required discharge quality. This includes the integration of source controls, flow conveyance, sediment retention, and, where necessary, chemical treatment.

Erosion control measures focus on limiting sediment generation and include:

- Staging of works to minimise the extent of exposed soil
- Progressive stabilisation of disturbed areas using vegetation, mulching, or geotextiles
- Management of slope length and surface runoff to avoid concentration of flows
- Rapid stabilisation of completed earthworks areas

Sediment control measures are implemented to capture and treat sediment-laden runoff that cannot be prevented through erosion control. These include:

- Dirty water diversion bunds and channels to intercept and direct runoff
- Super silt fences and decanting earth bunds to promote sediment settling
- Sediment retention ponds, where practicable and necessary
- In-channel controls such as check dams and rock-lined drains to reduce flow velocity

Where required, sediment removal is enhanced through chemical treatment (e.g. flocculants), particularly where fine sediments are present or where conventional controls alone are insufficient.

Due to the steep topography, scale of the site, and the presence of high ecology values, ESC measures are generally distributed across the site and applied on a catchment basis, rather than relying on large centralised systems. This approach reduces disturbance, improves constructability, and supports the project's preference for diffuse discharge to vegetated areas.

Clean and dirty water are separated where practicable to prevent unnecessary contamination of runoff. Where separation is not practicable, combined flows are treated through appropriate sediment control measures and, where necessary, additional treatment capacity is provided.

Stockpiles and spoil areas are managed to prevent sediment mobilisation through appropriate siting, bunding, and stabilisation measures.

All ESC measures are installed prior to the commencement of earthworks within each catchment, maintained throughout construction, and progressively modified as works advance. Disturbed areas are stabilised as soon as practicable to reduce ongoing erosion risk.

Given the presence of subterranean karst features, particular care is taken to ensure that sediment-laden runoff is treated prior to discharge or infiltration, and that concentrated flows are not directed into tomo or karst features. Where practicable, diffuse discharge to vegetated areas is utilised to support natural filtration processes.

ESC measures are subject to regular inspection and maintenance, including daily checks during active works and inspections following rainfall events. Measures are repaired, cleaned, or upgraded as required to maintain performance. An adaptive management approach is adopted, whereby ESC measures are refined in response to monitoring results, site conditions, and observed performance to ensure ongoing compliance with consent requirements.

Detailed design, sizing, and placement of erosion and sediment control measures are provided within the SSESCPs.

9.1 Chemical Treatment

Chemical treatment is used to enhance the removal of fine suspended sediments from stormwater where erosion and sediment control measures alone are insufficient to achieve the required discharge quality.

Chemical treatment is applied as part of the treatment train approach.

Chemical treatment is supported by:

- Inspection and maintenance of treatment systems
- Adjustment of application rates and methods as required
- Chemicals are handled, stored, and applied in accordance with relevant safety requirements and the project Chemical Treatment Plan. Measures are implemented to minimise risks to the environment, including containment of spills and management of pH where required.
- Detailed methodologies, dosing procedures, monitoring requirements, and health and safety controls are provided in the SSESCP's and Chemical Treatment Plan.

Refer to Appendix A for the Chemical Treatment Plan.

10 Karst (Tomo) Management

Karst features (including tomo/sinkholes) are present within the project area and require specific ESC management to minimise the potential for sediment discharge to subterranean systems and to minimise disruption to natural drainage patterns.

In accordance with the project's erosion and sediment control philosophy, management of karst features is based on a best practicable option (BPO) approach, with a focus on minimising disturbance and treating runoff prior to discharge or infiltration.

Key management principles include:

- Avoidance of direct discharge: Stormwater runoff, particularly from disturbed areas, is not directed into tomo or karst features. Runoff is instead treated through erosion and sediment control measures prior to discharge.
- Maintenance of natural drainage patterns: Existing drainage pathways are maintained where practicable and unnecessary diversion or concentration of flows toward karst features is avoided.

- Diffuse discharge approach: Treated stormwater is preferentially discharged as diffuse flow to vegetated areas, allowing filtration and infiltration through soils prior to entering subsurface systems.
- Integration with ESC measures: Karst protection is achieved through the application of erosion control, sediment retention, and, where required, chemical treatment to ensure discharge quality meets consent standards.
- Minimisation of disturbance: Earthworks are staged and managed to reduce exposed areas and limit the generation of sediment that could enter karst systems.

Where tomo or karst features are located within the construction footprint, they will be disturbed or infilled as necessary for construction. In these cases:

- The feature is managed as part of the surrounding earthworks area
- Erosion and sediment control measures are implemented to ensure that runoff from the disturbed area is appropriately contained and treated
- The tomo remediation methodology in the Earthworks Specification is used to fill the tomo (refer to Figure 4)
- Finished surfaces are stabilised to prevent ongoing sediment generation
- Surface drainage is managed to avoid creating preferential flow paths into the feature

This approach recognises that, in some instances, full avoidance of karst features is not practicable due to the scale and layout of the project. Management therefore focuses on controlling sediment generation and ensuring treated runoff does not adversely affect karst systems, rather than attempting to preserve all features in their existing form.

Detailed erosion and sediment control measures for areas containing or adjacent to karst features are provided in the relevant SSESCPs.

3.5.12 Tomo remediation

Where a sink hole (tomo) is encountered on site where filling is proposed, the following methodology shall be followed to allow compaction above:

1. Contractor shall check resource consents and with the Principal that the Tomo is allowed to be filled in.
2. Using a long reach excavator sitting at the top of the tomo, remove topsoil and any loose material at base and sides of tomo. The Designer to inspect if any voids need filling. No personnel to enter the tomo until step 6 is completed.
3. Place a filter cloth (Bidim A39 or equivalent approved) on the base and up the sides. Place a geogrid (Tensar TX170 or equivalent approved) over the base using machinery.
4. Fill the bottom 1.5 m with imported crushed GAP65 (SUBBASE). Geogrid reinforced every 0.5 m thickness.
5. Compaction undertaken using a robotic trench roller in 175 mm thick loose layers.
6. Once 1.5 m of fill is placed, the area is proof rolled with an articulated dump truck (or other plant if approved by the Designer) to check if weaving or settlement occurs.
7. Providing Step 6 is successful, remaining fill >1.5 m from base can be site won limestone.

This methodology excludes turbine foundations which will have concrete or grout placed if tomos are encountered.

Figure 4: Earthworks specification excerpt - clause 3.5.12 Tomo remediation

11 Construction Staging and Disturbance Management

11.1 Staging Approach & Maximum Area of Disturbance

Construction activities will be undertaken in a progressive and staged manner to minimise the extent of exposed ground and reduce the potential for erosion and sediment generation.

Staging is implemented to:

- Limit the area of active disturbance at any one time
- Reduce the volume and rate of stormwater runoff from exposed areas
- Enable the timely installation and effective operation of erosion and sediment control measures
- Facilitate progressive stabilisation of completed work areas

Earthworks will be advanced in discrete work areas, with erosion and sediment control measures installed prior to disturbance. Areas will be stabilised as soon as practicable following completion of earthworks to minimise ongoing sediment generation.

Due to the scale and configuration of the project, staging is managed on a catchment level basis, with each work area designed to ensure that runoff is appropriately contained and treated in accordance with the erosion and sediment control strategy.

Detailed staging, including the sequencing of works, extent of disturbance, and catchment-specific control measures, is provided in the relevant SSESCPs.

12 Stockpile and Spoil Management

Stockpile and spoil management measures are implemented to minimise erosion and sediment generation associated with the storage, handling, and disposal of excavated materials during construction.

This includes the management of:

- Topsoil stripped from construction areas
- Excavated spoil generated from earthworks
- Temporary stockpiles associated with construction activities

Management of these materials is consistent with the erosion and sediment control strategy and forms part of the overall treatment train approach.

12.1 Topsoil Management

Topsoil is stripped, stored, and reused to support stabilisation and rehabilitation of disturbed areas.

Topsoil management measures include:

- Stripping topsoil only where required and in accordance with construction staging
- Storing topsoil in designated areas outside of active flow paths where practicable
- Installing appropriate erosion and sediment control measures (e.g. bunds, silt fences) around stockpiles
- Stabilising stockpiles where they are inactive for extended periods, including:
  - Seeding or mulching
  - Use of geotextiles or soil binders where required

Topsoil is progressively reused for:

- Rehabilitation of completed work areas
- Final stabilisation and revegetation

12.2 Spoil Disposal

Excavated spoil is managed to minimise handling, reduce disturbance, and limit the potential for sediment generation.

Spoil management principles include:

- Reusing excavated material on site where practicable (e.g. construction of access roads and platforms)
- Utilising the designated spoil disposal areas
- Placing spoil in a controlled manner to form stable landforms

Spoil disposal areas are managed to ensure:

- Surface stability
- Controlled drainage
- Compatibility with final landform and rehabilitation requirements

12.3 Controls

All stockpiles and spoil areas are subject to appropriate erosion and sediment control measures to prevent sediment mobilisation during rainfall events.

Controls include:

- Perimeter controls such as:
  - Earth bunds
  - Super silt fences
- Dirty water diversion controls to direct runoff to treatment devices
- Stabilised access routes where required to reduce tracking of sediment
- Progressive shaping and compaction to improve stability

Where required, additional measures may include:

- Chemical stabilisation (e.g. application of soil binders)
- Covering stockpiles during high-risk periods

Runoff from stockpile and spoil areas is treated through the site erosion and sediment control system prior to discharge.

Detailed management of stockpile and spoil areas is contained in the SSESCP's.

12.4 Staging and Rehabilitation

Stockpile and spoil management is integrated with the project staging approach:

- Stockpiling and disposal occurs progressively to minimise the volume of material stored at any one time
- Long-term stockpiling is avoided where practicable
- Areas are stabilised as soon as practicable following placement or finalisation

Rehabilitation measures include:

- Regrading to stable slopes
- Topsoiling and revegetation
- Integration with surrounding landform and drainage patterns

13 Monitoring, Inspection and Maintenance

Monitoring, inspection, and water quality management are undertaken to ensure that erosion and sediment control (ESC) measures are effective and that discharges from the site comply with resource consent requirements.

Monitoring comprises routine inspection, visual assessment, targeted sampling, and independent audit.

13.1 Routine Inspection and Maintenance

All ESC measures are inspected and maintained to ensure effective operation throughout construction.

ESC measures are inspected at least daily during active works and following any rainfall event exceeding 5 mm. Inspections include assessment of sediment control devices, diversion and drainage systems, discharge points and stockpiles and disturbed areas. Where required, accumulated sediment is removed and damaged or ineffective controls are repaired or replaced.

13.2 Visual Monitoring of Discharges

During any discharge of construction stormwater each catchment is visually assessed for discolouration, sediment plumes and oil or grease sheens. Visual observations are photographed, recorded and retained.

Visual monitoring is the primary trigger for further investigation and determines when sampling is required.

13.3 Triggered Water Quality Sampling

Water quality sampling is undertaken where visual monitoring indicates potential non-compliance. Sampling is triggered where:

- There is a reduction in visual clarity in the receiving environment, associated with site discharge
- There is evidence of sediment discharge, sheens, films or discolouration.

This triggers measurement of TSS using calibrated instruments by suitably qualified personnel. Condition 3 of CRC264961 specifies the discharge shall not result in a TSS concentration that exceeds 100mg/L.

Where monitoring identifies exceedance of consent conditions, the discharge must cease immediately and may only recommence once TSS ≤ 100 mg/L is achieved and any source of oil, grease or contamination is removed.

Corrective actions for an exceedance may include repair or upgrade of ESC measures, installation of additional controls and/or application of chemical treatment.

All exceedances and corrective actions are recorded.

13.4 Independent Audit

ESC measures are independently audited at least twice per year during construction by a suitably qualified and experienced independent person.

The purpose of the audit is to confirm:

- Measures are constructed in accordance with SSESCPs

- Controls are maintained and functioning effectively

Audit records and resulting actions are retained and provided on request.

13.5 Spring Water Sampling

Water quality monitoring of specified springs near the project site is required to be undertaken during construction and one year following completion by Condition 34 of CRC264961 and Condition 42 of RC260077.

Monitoring includes:

- Water quality parameters:
  - Suspended sediment
  - Hydrocarbon indicators (e.g. TPH, PAH)
  - pH and clarity
- Deposited sediment surveys

Results are assessed against:

- Schedule 5 water quality criteria
- Site baseline or previous monitoring results

Where monitoring results exceed defined thresholds, ESC measures are reviewed and upgraded, and additional monitoring is undertaken. If additional monitoring continues to exceed the thresholds, a formal investigation and reporting to ECan is required.

13.6 Records and Reporting

Records of inspections, maintenance, and monitoring results are maintained on site and made available to ECan or HDC upon request.

Monitoring and inspection records include:

- Inspection dates and observations
- Maintenance actions undertaken
- Water quality monitoring results
- Any incidents, exceedances, or corrective actions

14 Stabilisation

Temporary stabilisation is applied to disturbed areas where works are paused or where exposure is expected to persist for a short duration.

Temporary stabilisation measures may include:

- Mulching or erosion control matting
- Hydroseeding or grass seeding
- Application of soil binders or stabilising agents
- Surface roughening or compaction to reduce erosion

Temporary stabilisation is used to:

- Protect exposed soils during construction
- Reduce sediment mobilisation during rainfall events

- Maintain site stability until final works are complete

Areas requiring temporary stabilisation are identified through routine inspection and monitoring and implemented as part of the adaptive management framework.

Final stabilisation (rehabilitation) is undertaken following completion of earthworks to achieve a long-term stable condition and enable the removal of erosion and sediment control measures.

Final stabilisation measures include:

- Placement and shaping of final landforms
- Application of topsoil
- Establishment of vegetation cover through seeding or planting
- Integration of disturbed areas with surrounding landform and drainage patterns

Final stabilisation must:

- Be sufficient to prevent erosion and sediment runoff
- Achieve vegetation cover or surface stability appropriate to the site conditions
- Be completed prior to decommissioning of erosion and sediment control measures

15 Decommissioning of ESC Measures

ESC measures are decommissioned following completion of construction works once the risk of sediment discharge has been minimised and disturbed areas are stabilised or rehabilitated.

ESC measures will only be decommissioned where:

- Contributing catchments are fully stabilised
- Vegetation cover or surface stability has been established
- There is no ongoing risk of sediment-laden runoff

Decommissioning is undertaken in accordance with the project's stabilisation and rehabilitation strategy and forms the final stage of the erosion and sediment control process.

ESC measures are decommissioned in the following sequence:

1. Stabilisation of disturbed areas. All exposed soils are stabilised and/or revegetated to minimise erosion
2. Removal of accumulated sediment and contaminants. Sediment, debris, and any hydrocarbons are removed from ESC measures
3. Removal of ESC structures. Bunds, fences, and other control measures are dismantled and removed
4. Disposal of materials. Removed sediment and materials are disposed of at an authorised facility

This sequence ensures that stabilisation is achieved prior to removal of controls, consistent with consent requirements

During decommissioning care is taken to avoid remobilisation of sediment and prevent discharge to receiving environments. Any disturbed areas resulting from removal of ESC measures are reinstated and stabilised as required. Where necessary temporary controls may be retained or reinstated until stabilisation is confirmed.

Prior to decommissioning areas are inspected to confirm stabilisation has been achieved and ESC measures are no longer required.

Following decommissioning inspections are undertaken to confirm no erosion or sediment discharge is occurring and rehabilitation measures are effective.

The timing and methodology for decommissioning ESC measures may be further defined in the relevant SSESCPs.

Decommissioning is carried out on a catchment-by-catchment basis, consistent with the staging approach and stabilisation of each work area.

16 Appendices

Appendix	Description
A	Chemical Treatment Plan

Appendix A – Chemical Treatment Plan

SOUTHERNSKIES ENVIRONMENTAL

CHEMICAL TREATMENT MANAGEMENT PLAN

MT. CASS WINDFARM
CANTERBURY

FEBRUARY 2026

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TABLE OF CONTENTS

1.0 INTRODUCTION

SouthernSkies Environmental (SouthernSkies) has been engaged by Taylors Contracting to prepare a Chemical Treatment Management Plan (CTMP) to provide treatment during the earthworks phase of the Mt. Cass Windfarm Project, Waipara Valley, Canterbury.

This CTMP details the chemical treatment system that will be implemented on the site to treat the sediment laden runoff during the earthworks phase. Sediment Retention Ponds (SRPs) and Decanting Earth Bunds (DEBs) will be used during the earthworks phase as detailed in the Site Specific Erosion and Sediment Control Plans.

The recommended methodology to be used on site is based on a rainfall activated dosing system. If alternative dosing (such as flow activated dosing) is required or proposed, then this CTMP should be updated.

2.0 METHODOLOGY

The testing methodology used is based on the SRP flocculation system and guideline developed on behalf of the Auckland Regional Council.

Bench test flocculation trials were undertaken using chemicals to determine soil reactivity to chemical treatment in accordance with the Auckland Regional Council document titled *"The Use of Flocculants and Coagulants to Aid the Settlement of Suspended Sediment in Earthworks Runoff" (Technical Publication 227 – dated June 2007)* and Auckland Council Guideline Document 2016/005 *'Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region'*, Incorporating Amendment 1 (GD05).

Poly Aluminium Chloride (PAC) was used for the bench testing, supplied to SouthernSkies by IXOM Chemicals.

3.0 BENCH TEST TRIALS

The chemical and dose rate required to achieve satisfactory removal of suspended solids from earthworks runoff depends on physical and chemical characteristics of the soil.

Two soil samples taken from the subsoil of Road 00 and Road 01 were used to make up artificial stormwater for testing to evaluate the dose required for treatment.

Bench testing has been undertaken to determine the optimum chemical and dose rate for suspended solids removal, and the effects of the chemical dose on pH of the treated water. Additional bench testing will be completed as required, and results will be added to Appendix C.

Ongoing monitoring of treated sediment retention devices will also be required, as outlined in Appendix B. If the monitoring highlights any deficiencies further bench testing will be undertaken.

Highlighted rows in green identify the optimal dose rate identified during the test. Highlighted rows in red determine dose rates that cause the pH to fall below 5.5.

3.1 Sample 1 – Road 00

Initial pH: 6.68 *Initial turbidity: 2084 NTU*

Aluminium Dose (mg/L)	Clarity (mm) after 5mins	Clarity (mm) after 30mins	Clarity (mm) after 60mins	Final pH after 60mins	Final turbidity after 60mins
0	20	25	30	6.56	421
2	90	110	120+	6.40	59
4	100	120	120+	6.12	45
6	70	80	100	5.91	72
8	50	60	100	5.75	71
10	40	45	60	5.52	113

Control 2mg/L 4mg/L 6mg/L 8mg/L 10mg/L

3.2 Sample 2 – Road 01

Initial pH: 6.80 *Initial turbidity: 2794 NTU*

Aluminium Dose (mg/L)	Clarity (mm) after 5mins	Clarity (mm) after 30mins	Clarity (mm) after 60mins	Final pH after 60mins	Final turbidity after 60mins
0	15	15	15	6.49	1255
2	15	15	15	6.44	907
4	20	25	30	6.31	468
6	30	30	35	6.15	329
8	55	55	70	5.91	252
10	120+	120+	120+	5.75	61

Control 2mg/L 4mg/L 6mg/L 8mg/L 10mg/L

4.0 DISCUSSION

Various dose rates of Polyaluminium Chloride (PAC) were successful in providing an improvement in clarity and turbidity over the control tests. Therefore, it is recommended that PAC is used on site.

Road 00 - The recommended dose rate is 2 milligrams of aluminium per litre. This is equivalent to 31mls of PAC to 1 cubic metre of sediment laden runoff.

Road 01 - The recommended dose rate is 10 milligrams of aluminium per litre. This is equivalent to 155mls of PAC to 1 cubic metre of sediment laden runoff.

Throughout the project, if poor clarity in a device is observed then the dose rate should be altered. Soil samples can be collected and retested to ensure that the project is using the correct dose rate. Adjustments to the dose rate will be made as required to optimise the use of chemical treatment.

Note: Different PAC products may have different aluminium content and specific gravity and thus, respond at different rates. The product tested has a specific gravity of approximately 1.2 and has greater than or equal to 10% Al2O3. If PAC is sourced from different suppliers, the specific gravity and aluminium oxide concentration should be checked and if differing from those tested, may need to be re-tested to confirm dosage rates.

It is recommended that the project utilises a rainfall activated dosing method for any runoff from the site. A batch dosing criteria and method is also provided.

RECOMMENDED FLOCCULATION SYSTEM

4.1 Rainfall Activated Dosing System

The rainfall activated dosing system has been developed specifically for earthworks sites. The system uses a rainfall catchment tray to capture rainfall with the size of the tray being determined by the required chemical dose and the land catchment size.

Rainwater caught by the catchment tray is piped into a header tank, and then into a 400L displacement tank which floats in a larger tank containing the flocculant filled to the level of an outlet pipe leading to the sediment laden diversion about 10m upstream of the sediment control device. The greater the rate of rainwater flow into the displacement tank the greater the flow of flocculant into the sediment laden runoff channel. The header tank is designed to provide for no dosing during the initial rainfall of up to 12mm of rain under dry conditions, and for attenuation of the chemical flow during the initial stages of a storm and after rain has ceased at the end of a storm.

Many alternative systems have been developed but are generally based on that same components as the traditional floc shed. The specific dosing device used on site should be reflected in sizing details provided in Section 7.1 of the SSESCPs.

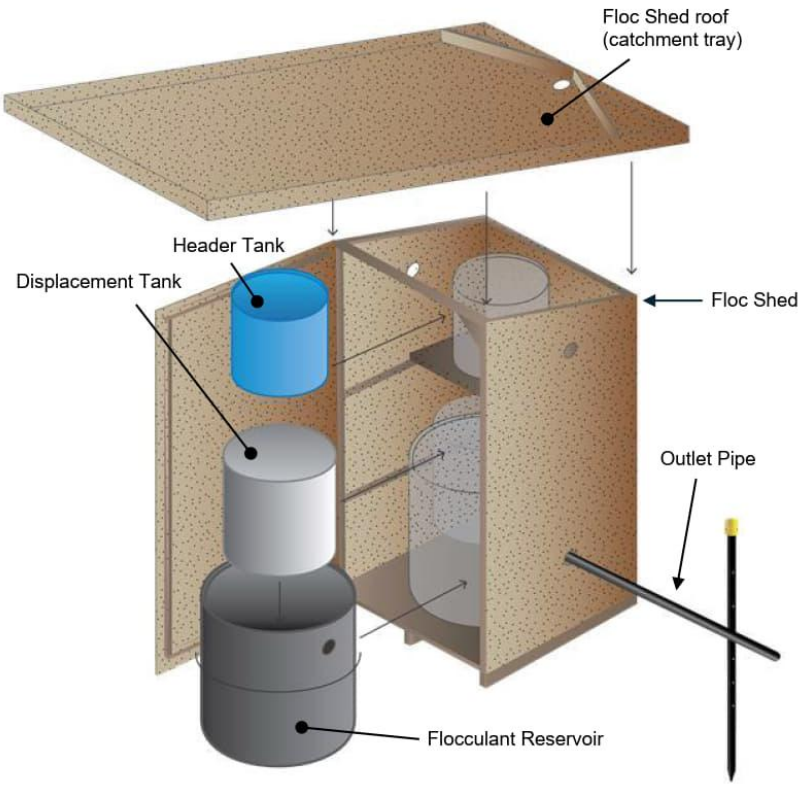

Figure 1: Traditional Floc Shed Schematic.

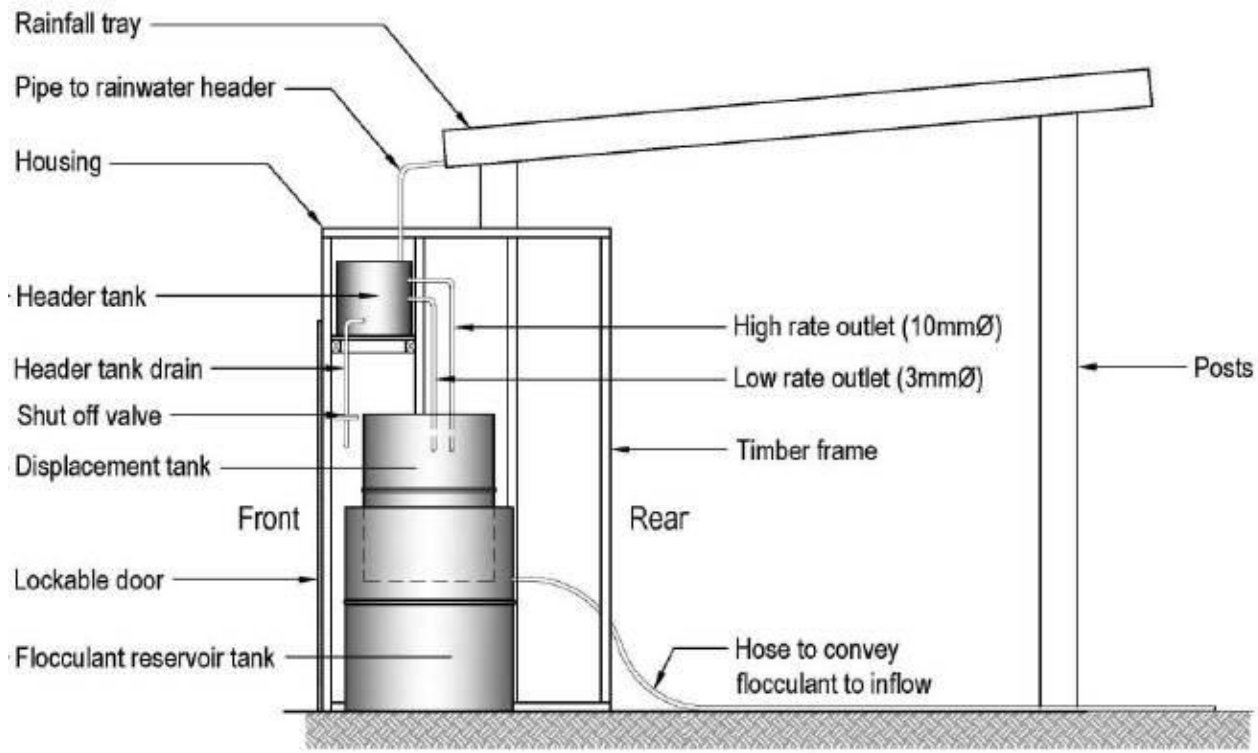

Figure 2: Components of the floc shed.

Alternative products such as the Floc Box (Figure 3) and Portafloc (Figure 4) contain the same required components.

Figure 3: Floc Box

Figure 4: Portafloc

4.1.1 Area of rainwater catchment tray required for rainfall activated system

The area of the rainwater catchment tray is determined by the dose required, and the area of the earthwork's catchment draining to the sediment control device.

All water flowing into the sediment control device needs to be treated, and the rainwater catchment tray size is determined by the total land catchment area draining to the sediment control device including both the 'open' area and stable areas. If the catchment area is changed, then the catchment tray size should also be changed in proportion. Reduction of the tray size is easily

achieved by placing a piece of plywood on top of the upstand over the lower end of the tray, thereby allowing the rain which falls on the plywood to run to waste.

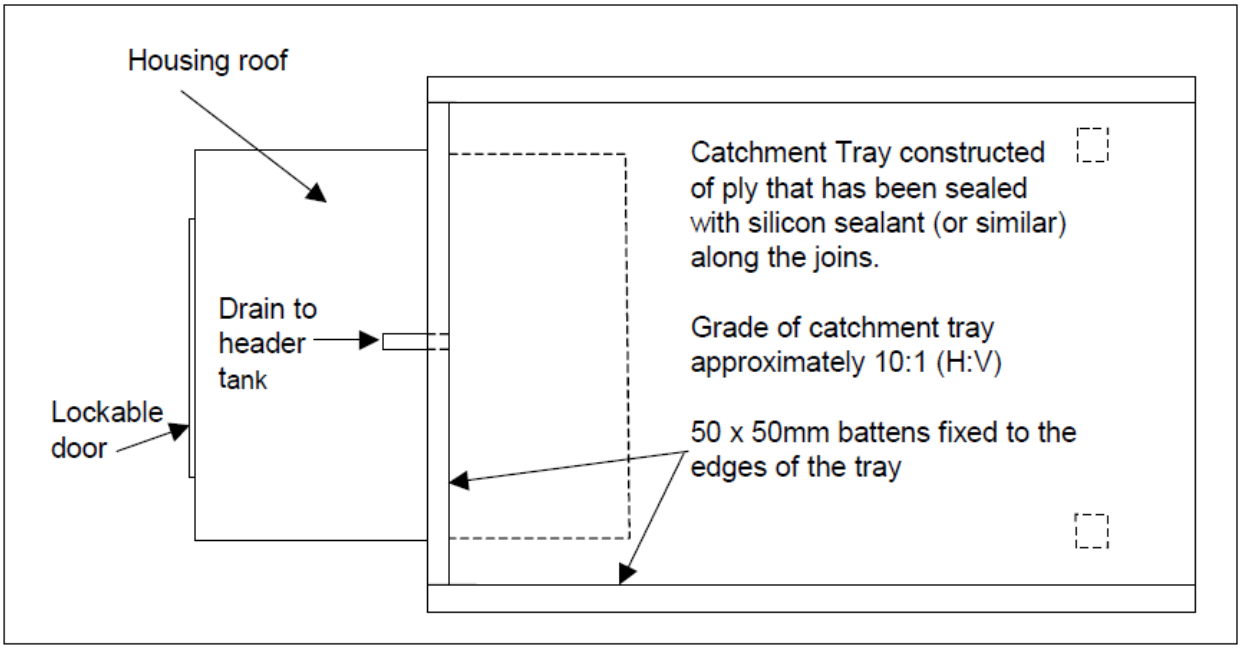

Figure 3: Roof tray design.

The required tray size is determined by the dose rate as shown in Table 1 below. For example, a 4mg/L PAC dose rate requires 0.75m^2 per hectare of exposed land catchment draining to the sediment control device. This is the area inside the upstand around the edge of the tray.

Table 1: Dose rates and required roof tray size.

PAC dose rate	1L PAC treats _m3 of s/w	PAC dose rate	Roof tray size
mg/l	L/m3	ml/m3	m2/ha
1	64	15.5	0.185
2	32.1	31	0.37
4	16.05	62	0.75
6	10.7	93	1.12
8	8.03	124	1.5
10	6.42	155	1.87

Section 7.1 of the SSESCP provides the chemical dosing systems setup details, including the sediment control device, catchment area, roof tray size and header tank spacing.

Note: It is recommended that roof tray sizes greater than 3m^2 is split between two chemical dosing systems. In this situation the roof tray and header tank spacing would be divided evenly between the two dosing systems.

4.1.2 Header Tank Outlet Spacing

Rainfall from the catchment tray is drained into a header tank. This provides a storage capacity that avoids dosing during initial rainfall following a dry period and to attenuate dosing at the beginning and end of a rainstorm event.

The volume between the drain (lowest) header tank outlet and the first dosing outlet is equal to the volume of 12mm of rain on the catchment tray and the volume between the first and second dosing outlets is the same.

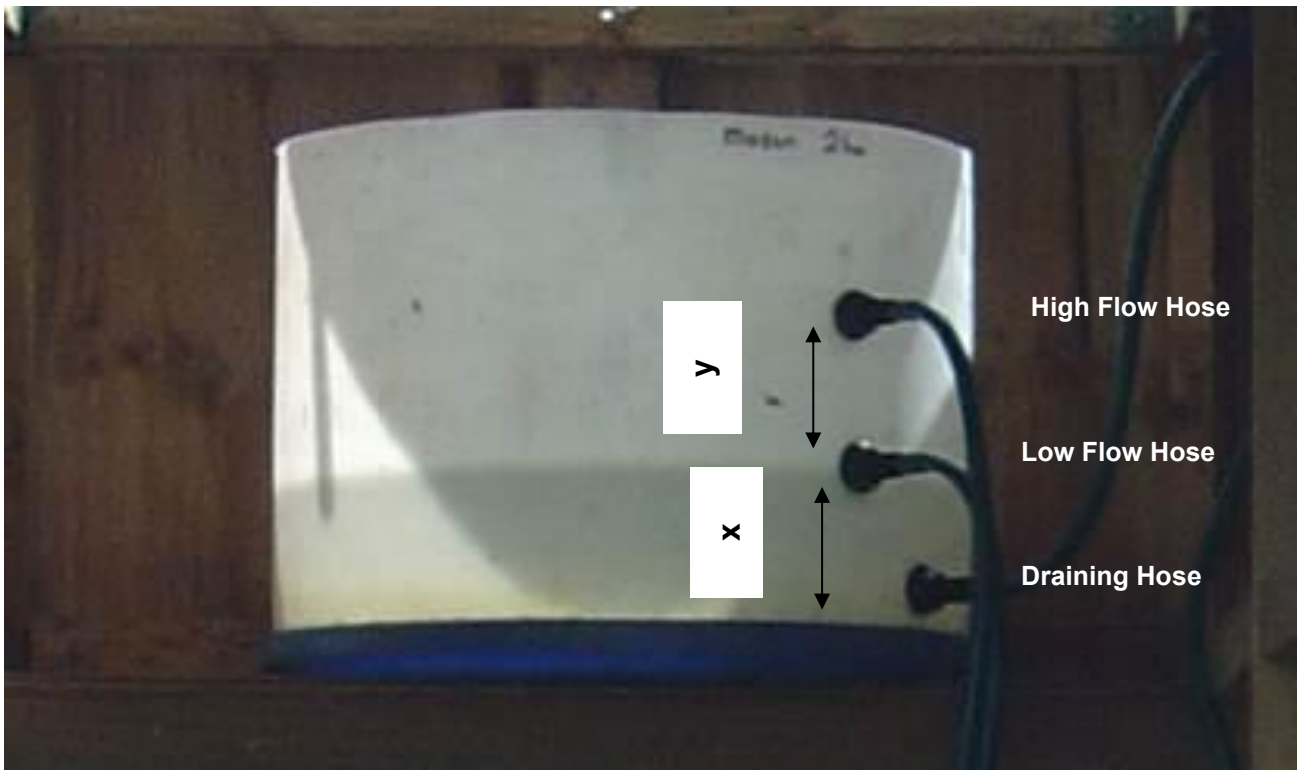

Figure 4: Header tank spacing.

Refer to Section 7.1 of the SSESCP for the header tank spacing details for each chemical dosing device.

The distances provided are between the base of the header tank (or height from draining hose if the draining hose is higher than the base of the header tank) and the first dosing outlet which is equal to the volume of 12mm of rainfall on the catchment tray (distance x). The distance between the first dosing outlet and the high flow outlet is the same (distance y).

Note: If the roof tray is split between two chemical dosing systems, then the header tank spacing would also be divided evenly between the two dosing systems.

Header Tank management in summer months to be as per the GD05 guidelines:

- After 3 days without rain – reduce volume by 50%
- After 6 days without rain – empty completely

4.1.3 Sediment Laden Runoff Channel and Dosing Point for Rainfall Activated System

The PAC needs to be added to the sediment laden runoff channel to provide mixing with the sediment laden runoff before it reaches the area of ponded water in the SRP or a DEB.

All sediment laden runoff from the catchment should be combined into a single channel if possible before it reaches the chemical dosing point which should be located at 5 - 10 metres prior to the point where the runoff reaches the ponded water of the SRP forebay or DEB, so the PAC can be added to and mixed with the total inflow.

The dosing point should be at a location where the chemical will fall into the sediment laden flow during periods of low flow. The end of the dosing hose should be approximately 200-300mm above the diversion channel to ensure that the chemical falls into the sediment laden runoff and is not blown away during periods of strong wind.

4.2 Batch Dosing

Batch dosing is not recommended as the primary dosing system. It can be utilised as additional dosing where adequate water quality has not been achieved, but with careful monitoring of pH.

The criterion to establish the need for batch dosing is the clarity of the sediment laden runoff. Clarity is measured using a black disk lowered vertically into the water to be tested. A small black disc of 50-80mm diameter is attached to a 1m long stick with a centimetre scale starting at the disc. The disc is lowered into the water until it disappears and then is raised until it just reappears. The depth of reappearance is recorded as the clarity of the water.

Water with a clarity of 100mm or greater is considered to be acceptable for discharge. Water with a depth of clarity of less than 60mm should be batch dosed. If the sediment laden runoff has clarity between 60-100mm after rainfall has ceased, it should be left for 48 hours to settle. If the clarity has not reached 100mm after 48 hours, or if sediment laden runoff has to be discharged within 48 hours because the pond is full, the sediment laden runoff should be batch treated.

The batch dose rate for Road 00 is 31ml of PAC per m^3 of runoff.

The batch dose rate for Road 01 is 155ml of PAC per m^3 of runoff.

Application Procedure (batch dosing)

The chemical dose should be applied evenly over the surface of the SRP as quickly as practicable. It is best to apply the dose in one application, rather than going over the surface of the SRP two or more times.

The total dose may be applied in one of two ways.

a) Spray.
   The chemical can be applied to the surface of the pond using a sprayer that produces large drops.

b) Bucket.
Place no more than 1 litre of chemical in a 10-litre bucket and throw the chemical onto the pond surface so that the chemical divides into drops before hitting the surface.

Following batch treatment and the settlement of the coagulated solids the SRP water can be discharged. Settlement generally requires 1-2 hours.

5.0 MONITORING AND MAINTENANCE REQUIREMENTS

5.1 Routine Management and Maintenance

Instructions for routine management and maintenance of the chemical treatment system are provided in Appendix A. It is recommended that a copy of this table be kept onsite and available for review.

All monitoring records and maintenance checks and actions should be recorded on the monthly record sheet provided in Appendix B. The systems should be checked after each rainfall event, and during dry periods the systems should be checked weekly.

It is also noted that chemical treatment increases the sediment removal efficiency of the sediment controls. The sediment controls will need to be regularly desilted to ensure that the maximum volume is re-established after rain events.

5.2 Contingency Management

Contingencies could include poor performance of the treatment system, or effects of other influences on sediment laden runoff quality, such as reduced pH, that might make the use of PAC inappropriate.

If the treated water in the sediment control device is consistently very clear it could indicate overdosing, and the possibility of lowered pH which can present a risk to receiving waters as a result of elevated free aluminium concentration in the discharge. If treated water is consistently clear, then the pH of the water in the sediment control should be tested.

Contingencies such as poor treatment performance or consistently very clear treated water should be dealt with by consulting the ECan and SouthernSkies or some other person qualified to advise on appropriate action.

A chemical spill contingency plan is provided in Section 10 below.

6.0 RECORD KEEPING AND REPORTING

A copy of the maintenance record for the chemical treatment system will be kept on site (Appendix B).

A copy of the maintenance record for the chemical treatment system is to be held on site and provided to the ECan on request.

7.0 STORAGE OF CHEMICAL ON SITE

Bulk PAC, which can be supplied by the manufacturer in 200L polyethylene drums, should be kept in secure storage, either in a locked shed or container. PAC drums should always be stored on end with the screw caps uppermost. Topping up of flocculent chemical will be made weekly as part of the regular inspection regime.

8.0 PROCEDURE FOR TRANSPORTATION

PAC will normally be delivered to the site by commercial carriers in accordance with current Hazardous Goods, Traffic and Transport regulation. PAC can be requested from the supplier generally in 20 litre containers, 200 litre drums and/or 1,000 litre IBCs. PAC weighs about 250kg and is most easily moved within the site in a loader bucket. The use of these or any other chemical must be done in accordance with the Site Health and Safety Plan.

9.0 CHEMICAL SPILL CONTINGENCY PLAN

If there is a spill of chemical onto the ground, it should be immediately contained using earth bunds to prevent it entering water. The spilt chemical should be recovered if possible and placed in polyethylene containers. If the spilt chemical cannot be recovered, it should be mixed with a volume of soil equal to at least ten times the volume of spilt chemical. This will effectively neutralize the chemical. The soil with which the chemical has been mixed should be buried in the ground a minimum of 0.5 metres below the surface.

If there is a spill of PAC into ponded water, discharge from the pond to natural water should be prevented. If there is a spill of PAC into flowing water:

1. ECan should be advised immediately.
2. The volume of the spill should be recorded.
3. If possible, the water and spilt chemical should be pumped into a bund or pond until all the spilt chemical has been removed from the watercourse.
4. If the chemical cannot be removed from the watercourse any downstream users should be identified and advised.

10.0 CHAIN OF RESPONSIBILITY FOR MONITORING AND MAINTAINING

The contractor shall have primary responsibility for maintenance and monitoring the effectiveness of the chemical treatment system. The contractor will check the effect of PAC dosing on the pH of the treated water once the sediment control devices have filled for the first time and monitor pH and overall performance throughout the duration of works.

11.0 TRAINING OF PERSON RESPONSIBLE FOR MONITORING AND MAINTENANCE

If a person with experience in the monitoring and maintenance of the chemical treatment system is not available, SouthernSkies will train a person nominated by the contractor to carry out the routine monitoring and maintenance of the chemical treatment system, and to keep the required records.

APPENDIX A. INSTRUCTIONS FOR MONITORING TREATMENT SYSTEMS FOR EARTHWORKS STORMWATER

A) PAC Dosing System

REDUCING THE HEADER TANK WATER VOLUME.

The header tank is used to avoid dosing during the initial stages of rainfall when site conditions are dry, and no runoff is to be expected.

The volume in the header tank is lowered using the lowest of the three outlet tubes.
After 3 days without rain - reduce volume to 50%.
After 6 days without rain - reduce volume to empty (level at lowest outlet).

REFILLING THE CHEMICAL RESERVOIR.

The chemical reservoir tank should be refilled when the white displacement tank is half full, or sooner if heavy rain is predicted. This is done by first emptying the white tank (baling with a bucket is efficient) and then refilling the black reservoir tank until the PAC level is at the lower edge of the outlet.

OBSERVATION OF WATER QUALITY IN POND.

The pond water quality will be observed at least weekly, and the clarity determined using a black disk and recorded on the monitoring sheet. pH shall be recorded once the pond has filled up to ensure that chemical dosing does not have an unacceptable effect.

The discharge from any SRP or DEB must have a pH between 5.5 and 8.5.

PERIODIC SYSTEM CHECKS.

Check that the rainfall catchment tray is not leaking – especially along the lower edge of the tray. This should be done after rainfall has ceased.

Check the lower hose with the small tube outlet, from the header tank to the displacement tank, is not blocked.

MONITORING RECORDS.

A separate sheet is provided for monitoring records for each month. The information to be recorded is as follows:

Visual check

Check the tray for leaks, the plumbing, and the hoses from the header tank. Record ‘ok’, or if maintenance is required write ‘M’ and note the requirement in the ‘Notes’ column.

How full is the header tank (%)

This is the volume between the lowest and middle outlets. After rain this should be either 100% after 12mm or more rain, or between 0-100% after less than 12mm rain. In summer: 50% when lowered after 3 dry days; 0% when emptied after 6 dry days.

Depth in Displacement Tank (%)

Measure depth of water in cm. Reduces to 0 when emptied.

Chemical volume added

Record the volume of chemical added. 1 drum of PAC = 200L, 9cm in 200L drum = 20L. The volume can also be calculated from change in water level in displacement tank where 1cm change = 4 litres of chemical.

Clarity: Record using black disc near outlet. (Refer above).

> >100mm of water clarity is required for discharging treated water during dewatering and pumping operations.

APPENDIX B. MONITORING AND MAINTENANCE RECORDS

A) Rainfall Activated Dosing System

Site: Mt. Cass Windfarm

Sediment Control Device: **Month:** **Maintenance Person:**

Date	Visual check	% Header Full	Water depth In Displacement Tank (cm)	PAC Volume Added	Water Clarity (cm)	pH	Notes on maintenance required or additional information	Initial
01								
02								
03								
04								
05								
06								
07								
08								
09								
10								
11								
12								
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APPENDIX C. BENCH TESTING RESULTS

As additional bench testing is completed, the results will be added to Appendix C.