

Buller Plateaux Continuation Project

Peer Review

Erosion and Sediment Control Plan for Land Disturbance Activities

20 August 2026

**Prepared by:
SouthernSkies Environmental Ltd
Revision A, 20 August 2026**

INTRODUCTION

1. My full name is Campbell Ross Stewart. I am a Director at SouthernSkies Environmental Limited (**SSEL**), an environmental consultancy specialising in erosion and sediment control (**ESC**), environmental management and planning.
2. This technical assessment provides an independent review of the *Erosion and Sediment Control Plan for Land-Disturbance Activities, Buller Plateaux Continuation Project*, prepared by Bathurst Resources Limited dated July 2026 (**ESCP**). The ESCP is a project wide overarching ESC management plan that provides for the standards, protocols and procedures for the management of ESC.

Qualifications and experience

3. I have the following qualifications and experience relevant to this assessment:
 - (a) Bachelor of Resource Studies from Lincoln University (1994).
 - (b) Over 31 years' experience in erosion and sediment control, including detailed involvement for councils and the construction industry, providing tendering, design, technical peer reviews, on-site guidance, auditing, and training for a range of private and public organisations.
 - (c) Certified Professional in Erosion and Sediment Control (**CPESC**) Number 7630, a qualification that is achieved through Envirocert International and the International Erosion Control Association.
 - (d) CPESC Ethics Committee member (2018 to 2019).
 - (e) Past director of the Australasian chapter of the International Erosion Control Association (**IECA**).
 - (f) I specialise in Erosion and Sediment Control and have provided tendering, design, technical peer reviews, on-site guidance, auditing, and training for a range of private and public organisations.
 - (g) I was the lead technical author of the Auckland Council Guideline Document 2016/05 '*Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region*' (**GD05**). I was the lead technical author of the 2026 review and update of GD05.

- (h) Projects for which I have provided ESC design and on-site support include:
- (i) ESC lead through tendering, planning and construction:
- (1) SH1 Brynderwyn Emergency Works NZTA (Northland) (2023 to 2024);
 - (2) SH1 Mangamuku Emergency Works NZTA (Northland) (2023 to 2025);
 - (3) Harapaki Windfarm (Hawkes Bay) (2019 to 2023);
 - (4) Waimea Dam (Tasman District) (2018 to 2022);
 - (5) SH1 Huntly Bypass (Waikato) (winner of Waikato Regional Council ESC earthworks site of the year 2017).
 - (6) Te Rapa Bypass (Waikato) (winner of Waikato Regional Council ESC earthworks site of the year 2011 and 2012);
 - (7) Te Uku Windfarm (Waikato) (winner of Waikato Regional Council ESC earthworks site of the year 2010);
 - (8) SH1 Taupo Bypass (2008 to 2010);
 - (9) SH16 Causeway (Auckland) (2013 to 2016);
 - (10) Lincoln Road (Auckland) (2010 to 2015);
 - (11) Te Atatu Road (Auckland) (2013 to 2015);
 - (12) Christchurch Southern (2009 to 2010) and Christchurch Northern Motorway (2016 to 2018).
- (ii) ESC lead through design, consenting and construction:
- (1) Te Ahu a Turanga – Manawatū Tararua Highway (2018 to 2024);
 - (2) SH1 Auckland Southern Motorway (2020 to present);
 - (3) Auckland Eastern Busway (2021 to 2025).
- (iii) Adaptive Management Plan Trigger Event Monitoring and Reporting:

- (1) Millwater Development (Wainui);
 - (2) Warkworth Ridge Development (Warkworth);
 - (3) Clevedon Meadows Development (Clevedon);
 - (4) Drury Town Centre Development (Drury);
 - (5) Several sites at Hobsonville (Auckland).
- (i) I have been the technical author or internal senior reviewer of nine (9) Fast Track Application technical assessment reports (2025-2026). Southern Skies Environmental Limited is currently preparing ESC Technical reports for four (4) projects to be lodged under the FTA process.
 - (j) I undertook a technical peer review for the Expert Consent panel that was considering the Southland Windfarm project under the COVID-19 Recovery [Fast Track Consenting] Act 2020.
4. I undertook an initial peer review in March 2026 of the following documents, as they relate to erosion and sediment control matters:
- (a) *Buller Plateaux Continuation Project – Erosion and Sediment Control Plan for Land Disturbing Activities, prepared by SLR Consulting Australia Pty Ltd, dated 30 January 2026.*
 - (b) *Final Adjusted Toolkits Combined*
5. I have had no previous involvement in the Project.

Code of conduct

6. I confirm that I have read the Code of Conduct for expert witnesses contained in the Environment Court Practice Note 2023. This assessment has been prepared in compliance with that Code, as if it were evidence being given in Environment Court proceedings. Unless I state otherwise, this assessment is within my area of expertise and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

Purpose and scope of assessment

7. This document provides the findings of my peer review of the Buller Plateaux Continuation Project (**the Project**) Fast Track Consent Application

proposed ESC methodology and associated supporting information as described in the ESCP prepared by Bathurst Resources Limited (**BRL**).

8. The development and operation of the Project, as I understand it and as relevant to my assessment, can be summarised as:
 - 8.1 Land disturbance (earthworks) required for the establishment of access, mining ancillary activities and the initial land disturbing activities associated with the establishment of the mining areas.
 - 8.2 Operation of the mining ancillary activities including use of haul roads and management of ancillary area runoff.
 - 8.3 Established mine operations are not included in the ESCP and are not part of this assessment.
9. The Project relates to five key sub areas. The ESCP is applicable to four of the five areas as they relate to land disturbing activities. The four areas are:
 - 9.1 Stockton Mining Area (**Stockton**);
 - 9.2 Mount Frederick South (**MFS**);
 - 9.3 Escarpment Extended (**ESE**); and
 - 9.4 Upper Waimangaroa Haul Road (**UWHR**).
10. My assessment is limited to the establishment earthworks that disturb non-acid forming (**NAF**) materials. I also comment on the management of runoff from the operation of the haul roads. While the disturbance of potentially acid forming (**PAF**) material is noted in the ESCP, I do not address that activity or general mining activity. The management of those activities and associated runoff requires methods that are outside of my professional experience. The management of PAF is addressed in other management plans. I have not reviewed those documents and the management of PAF is not part of my assessment.
11. The overarching scope of my peer review is to assess the appropriateness of the ESC methodology, confirm its suitability for the site and whether it represents industry best-practice.

12. I have not made comment on any actual or potential effects, more detailed aspects of the construction methodology, or on aspects outside my field of expertise.
13. I undertook one (1) site visit on the 16th of July 2026.

Assumptions and exclusions in this assessment

14. I have not reviewed any other documents for the project.
15. The ESC is a project wide overarching ESC management plan that provides overarching procedures for the management of ESC, to be given effect through Site-Specific Erosion and Sediment Control Plans (**SSESCPs**) or Dig/Dump Plans (**DDPs**) that will be prepared, certified and submitted to the regulator after consents are granted and detailed design is undertaken. The SSESCPs or DDPs will provide the detailed ESC drawing, design information and detailed sizing and calculations for each area of work.
16. The SSESCPs will be prepared for all land disturbing areas associated with civil and ancillary construction. For initial land disturbing activities associated with the establishment of the mine areas (prior to commencement of mining) DDPs will be prepared, using existing mining management plans for the mine area. The ESCP requirements for the SSESCPs and DDPs are the same. Hereon in I will collectively refer to SSESCPs.
17. The ESCP is an ESC management plan document. It does not address or comment on the sediment related effects of land disturbance. BRL have confirmed that sediment related effects are addressed in other assessments in the application.

THE BULLER PLATEAUX CONTINUATION PROJECT

18. BRL has confirmed that a description for the Project is provided in the AEE. I have not reviewed the AEE.

DISCUSSION

ESCP Management Plan Approach

19. The purpose of the ESCP is to outline the ESC approach and measures that will be implemented throughout the work areas to ensure that any potential erosion and sediment control effects from the land disturbing activities are minimised to ensure that they are temporary and minor in nature.
20. Industry accepted practice for a large scale infrastructure project is that once the project is confirmed for construction, detailed design commences on a staged basis. That design informs the development of SSESCPs and equally, the project ESC specialist provides feedback into the construction methodology to achieve the most effective ESC during the works. Those SSESCPs are certified prior to implementation. On that basis I consider that the ESCP proposes an appropriate and recognised approach to ESC management. SSESCPs cannot practicably or reasonably be prepared at this time, prior to the commencement of detailed design.
21. Conditions of consent are proposed by BRL that require the preparation of the SSESCPs and be approved by a Suitably Qualified and Experienced Professional in Erosion and Sediment Control (**SQEP-ESC**), defined as either a Certified Professional in Erosion Control (**CPESC**) or a registered Soil Practitioner – Erosion and Sediment Control (**RSP-ESC**) prior to submission to the regulatory authority. The conditions specify the required content of the SSESCPs. I consider those conditions to reflect best-practice (based on my experience with similar conditions for other infrastructure projects) and include the appropriate and relevant information to appropriately minimise uncertainty on the information and design required for certification. That information includes the design guidelines noted below.
22. Best practice ESCs, methodologies and management will be implemented throughout the works in general accordance with Auckland Council *Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region* (GD05) 2018 but using the device sizing formula (storage volume sizing for sediment control) of the *Nelson Tasman Erosion and Sediment Control Guidelines* (July 2019) (**NTESCG**).

23. The ESCP outlines the principles and objectives, standards, monitoring and reporting for the earthwork's activities associated with the Project for both mining establishment and ancillary areas and sets out the methodology for designing water infrastructure, specifically for sediment control across the project where site runoff via controls will discharge to the receiving waterways.
24. Separately and not part of the ESCP, the *Water Infrastructure Design Plan* has been developed as part of the project that sets out the methodology for designing water infrastructure targeted towards infrastructure that is within the operational mining areas (pit operations, including where water is managed via "permanent" infrastructure within or adjacent to the mine). I have not reviewed the *Water Infrastructure Design Plan*.
25. The land disturbance operations to establish the mining areas and construct the associated ancillary areas and infrastructure are considered earthworks operations. These are managed differently to the mining operations. Once the mine is established, and the permanent water management systems and infrastructure are installed the mine water is managed under different management and design plans and controls. This is not addressed by the ESCP. Separate to the mining areas, the ongoing operations of the ancillary areas (haul roads etc.) will also transition to more permanent water management systems and infrastructure. These areas are addressed in the ESCP.
26. The ESCP is structured in two parts to address land disturbance associated with the construction phase (short term controls) and the operational phase (long term controls) of the Project ancillary areas (not the direct mine operations). These parts distinguish between short term erosion and sediment controls required during the construction and establishment, verse the long-term water management of the ongoing operations of the completed infrastructure and ancillary areas, separate to the mining activities, i.e. haul roads, disposal areas, yards etc
27. The three phase management approach is summarised as:
- 27.1 Construction Phase: All land disturbing activities (in accordance with GD05 and NTESCG sizing). These are addressed in the ESCP.
- 27.2 Operational Phase: all non-direct mining runoff (haul roads, yard and laydowns, disposal areas) managed via consolidated catchments to

permanent water management design pond devices, based on the Modified Fair and Geyer (**MFG**) design where practical. In some areas the construction phase controls may be retained). These are addressed in the ESCP.

27.3 Mining operations: actual mining pit water management (mine specific water management systems). Addressed in other documentation.

GD05 / NTESCG [ESC Guideline standards]

28. No specific ESC guideline has been developed for the West Coast Region. Therefore, the Project proposes to adopt the approaches detailed in two leading and most relevant New Zealand guidelines, being GD05 and the NTESCG. In my opinion, these are the most appropriate guidelines to adopt for the Project.
29. The ESCP recommends adopting GD05 principles and measures as a general requirement. I consider that complying with GD05 is appropriate and the overall approach is consistent with industry best-practice. GD05 is generally regarded as the leading best practice guideline within New Zealand. It is adopted by several regional authorities and is otherwise consistent with the approach taken in other recently promulgated regional guidelines. It is also generally consistent with the approach that has been successfully adopted across various large-scale development projects in the past decade, including windfarms, roading and other infrastructure, and including sites within the catchments of sensitive receiving environments¹.
30. GD05 provides a robust set of ESC principles that are broadly applicable across New Zealand, however it was developed for Auckland's climatic and hydrological settings. This is generally appropriate across large parts of New Zealand, however the project sites at the Buller Plateaux experience substantially higher rainfall than Auckland, with annual totals up to five times greater and with significantly more intense storm events. To allow for the difference in received rainfall, the NTESCG method to determine design rainfall with associated runoff flows and retention volumes has been selected for use. In my opinion, this basis of design appropriately considers the risk, timeframe and rainfall intensity aspects of each erosion and sediment control structure. For the Project, this will mean the sediment

¹ e.g. Ara Tūhono Pūhoi to Wellsford Road of National Significance, Pūhoi to Warkworth Section.

retention devices will be increased in size when compared to the sizing that would be generated under GD05.

31. Compliance with GD05 and using the sizing calculations from NTESCG provide the best opportunity for ESC to be effective through the land disturbing (earthwork) operations of the project.
32. Post construction, the ESCP has proposed a consolidation of runoff detention controls, with updated sizing based on the MFG model where practical. For example, once the haul road is constructed and all outside batters stabilised, runoff from these road surface and slopes would be directed into the resized controls and the construction controls be decommissioned. For catchments where catchment consolidation cannot occur the construction phase GD05/NTESCG controls will be retained.
33. I am not familiar with the MFG model, which is a stormwater engineering equation used to calculate the sediment removal efficiency of water bodies under turbulent or non-ideal settling conditions. It was chosen as it bases pond sizing and efficiency on incoming Total Suspended Solids (**TSS**) concentration and specified outflow TSS. It is primarily utilised in civil and environmental engineering to design stormwater extended detention basins, and stormwater ponds. In this case it allows for consolidation of stormwater treatment devices with sizing exceeding the design size guidance provided under GD05 or the NTESCG.
34. I make no further comment on the appropriateness of MFG, other than I consider it appropriate that post construction stormwater management is consolidated into fewer, permanent, water treatment devices that meet the same or higher water quality outcomes that of GD05 and the NTESCG.

Site Specific Erosion and Sediment Control Plans

35. The ESCP provides the required information for the development of SSESCPs which are to be prepared prior to any land disturbance or streamworks. Each SSESCP is proposed to be approved by a SQEP-ESC and provided to WCRC prior to any earthworks commencing.
36. The specific details required to be addressed by each SSESCP are outlined in Section 3.0 of the ESCP and in the proposed condition of consent ER06.
37. The SSESCPs provide the detail and are prepared as and when works progress. The preparation of SSESCPs (or similar) is a mechanism that

almost all large complex earthworks infrastructure projects operate within and is a standard best practice approach.

38. The use of SSESCPs in accordance with the principles of GD05 (storage volume sizing using NTESCG) and the ESCP, will allow for future flexibility and practicality of approach to ESC and will allow the project to have the ability to adapt to the characteristics of each works area within the Project and to changing conditions, which I consider appropriate.
39. The use of SSESCPs allows for the development of the detailed ESC methodologies and measures to be determined once detailed design of the works is developed which is often months or years after approval is sought. They allow for the SSESCPs to be staged, in line with project deliveries, and lessons learnt over time can be incorporated into the SSESCPs.
40. The development of the SSESCPs to industry best standards and adherence to the SSESCPs is the critical element to the successful implementation of ESC during the project works therefore determining whether the effects of sediment laden discharges are minimised as far as practicable.
41. For the Project a SQEP-ESC is defined as either a CPESC or RSP-ESC. Both are considered ESC expert qualifications and in my opinion are appropriate in the New Zealand context.

Streamworks

42. Streamworks activities are high risk from a sediment generation and discharge to the receiving environment perspective. The works require land disturbance operations directly in the receiving environment. GD05 outlines specific methodologies and procedures for undertaking streamworks, based around undertaking the works “in the dry” by establishing methodologies and diversion controls to take the works offline. The ESCP summarises these procedures and options.
43. The ESCP requires all streamworks to have a SSESCP prepared and approved by a SQEP-ESC to ensure that the proposed works and ESC controls and methodologies have been designed and developed in accordance with GD05.
44. I consider this to be appropriate.

Use of Chemical Treatment

45. The use of chemical treatment for sediment control management is widespread in New Zealand and is considered best practice.
46. The use of chemical treatment in most cases significantly enhances the efficiency of sediment retention ponds (**SRPs**) and decanting earth bunds (**DEBs**) and therefore can significantly reduce the sediment load that is discharged from the project to the receiving environment.
47. Typically, the use of chemical treatment is determined through the preparation of a Chemical Treatment Management Plan (**ChTMP**). Preparation of a ChTMP includes bench testing to determine the effectiveness of chemical treatment and an appropriate dose rate that maximises sediment retention and minimises sediment yield to the greatest extent practicable. The ESCP and Consent Condition ER06 require the Chemical Treatment Plans to be implemented as part of the working areas of each SSESCP.
48. As the earthworks phase of the project will increase sediment yield, chemical treatment required to be considered as part of the ESC methodology through the SSESCPs is appropriate.

Monitoring and Maintenance and Trigger Event Monitoring

49. Section 3.2 and Section 4.3 of the ESCP document the project's proposed ESC monitoring and maintenance regime. In my opinion, for a major infrastructure project with a significant earthwork's operations, it is the detail of the maintenance and monitoring that plays a critical role in the actual sediment related effects of the project.
50. The maintenance and monitoring regime should provide a program and methodology to ensure that ESC measures have been designed, installed, and managed in accordance with the ESC methodology and certified SSESCPs, and to monitor the effectiveness of the ESCs for the duration of the Project.
51. The monitoring and maintenance sections of the ESCP include the checks and balances to ensure that environmental compliance and expected performance will be achieved through appropriate location, design, installation, as-built certification, maintenance, and monitoring of ESC devices including trigger event monitoring. Note, ESC management in this

context is not restricted to physical structures but also includes work practices and methodologies. In my experience working on large infrastructure projects, the management structure of the Project is critical to achieving these outcomes.

52. The monitoring underpins the successful implementation of the ESC management system, to achieve the anticipated ESC environmental outcomes and ensure compliance with the resource consent conditions.
53. The monitoring will also provide continual feedback to ensure successful ESC performance and early detection of activities or problems that have the potential to result in an adverse environmental effect.
54. The ESC device monitoring and maintenance regime is in accordance with the principles of GD05. In addition to general daily and weekly site ESC management, ESC performance checks and water quality monitoring are proposed as part of a trigger event monitoring programme. Trigger event monitoring includes device and water quality monitoring that is instigated once a rain event of a specified depth and duration has occurred.
55. Hourly and 24-hourly rainfall triggers are proposed based on the 70th and 90th percentiles. This approach for trigger event monitoring is common on many large infrastructure projects. The ESCP has proposed that for the first two months following commissioning of a device the rainfall trigger will be the 70th percentile 24-hour trigger. Post two months and for the remainder of the device's operations, the 90th percentile, hourly and 24-hourly rainfall trigger are proposed.
56. The example provided in the ESCP of the rainfall triggers for areas using Stockton Met data as follows:
 - 70th percentile - 49 mm/day
 - 90th percentile - 8 mm/hr or 89 mm/day
57. The 70th percentile value was selected as a more stringent requirement for the first two months to ensure the sediment control structures are working as expected. The daily rainfall was considered appropriate during the first two months as the hourly 70th percentile value (3mm/hr) is unlikely to generate runoff to impact an SRP. Once SRP performance has been confirmed throughout the first two months, the sampling requirement is

proposed to extend out to the larger 90th percentile value only and include both hourly and daily rainfall triggers.

58. Section 7 of the ESCP details the weather monitoring, operational monitoring and incident response and reporting. Overall, the proposed maintenance and monitoring include routine requirements and trigger event and reporting that would be consistent with a large-scale earthworks' infrastructure project and industry best practice.

EFFECTIVELY MINIMISING SEDIMENT YIELD

59. Should the project be consented, it is in my experience that the key means by which effects are appropriately minimised and maintained within the consented envelope are:

- (a) Preparation of detailed SSESCPs, prepared by Suitably Qualified and Experienced Practitioner(s).
- (b) Certification of the SSESCPs by the regulator or a recognised ESC specialist.
- (c) A construction team with experienced ESC practitioners, including site managers and personnel that can implement and manage the SSESCPs.
- (d) A focus on erosion control and the appropriate balance of earthworks efficiency and staging to minimise exposed areas at any given time.
- (e) Designing and constructing control measures in accordance with industry best-practice, in this case GD05 with NTESCG storage volume sizing.
- (f) The opportunity through consent conditions for amendments to design that achieve the same or better outcomes as those assessed in the consenting phase, achieved through SSESCPs approvals.
- (g) Vigilant day to day monitoring and maintenance of ESC measures.

60. The ESCP provides an overarching management plan and structure to address the development and implementation of SSESCPs in accordance with land disturbing industry recognised ESC standards (GD05). The

ESCP provides for the ESC device and methodology monitoring and maintenance and included trigger event performance monitoring.

SUMMARY

61. I have reviewed the Erosion and Sediment Control Plan for Land Disturbing Activities, Buller Plateaux Continuation Project (ESCP).
62. I note the ESCP is not an assessment of effects reports, rather a construction management plan, to establish and set the standards and protocols for managing, operating and maintaining the ESC during generally the land disturbing activities of the construction and establishment phase of the mining areas and all ancillary areas.
63. The ESCP does not address the water management of the active mining operations. This is addressed via other management documents.
64. I do consider the GD05 guidelines appropriate for the large-scale earthwork operations associated with the project using the NTESCG for sizing of the sediment retention devices. Compliance with the guidelines is critical to minimise the sediment related effects of the project.
65. The use of chemical treatment in most cases significantly enhances the efficiency of the treatment devices (SRPs and DEBs), and therefore can significantly reduce the sediment yield that is discharged from the project to the receiving environment. In my opinion, the best practicable option is to minimise sediment discharge from site at all times, and at all locations. It is highly likely that chemical treatment would enhance this approach. The ESCP requires the use chemical to supplement treatment and managed and determined through the SSESCEPs. I recommend that chemical treatment is required as part of the SSESCEPs for the Project.
66. I consider the management plan approach proposed to be appropriate, and the overall approach is consistent with industry best-practice. I consider the SSESCEPs in accordance with the ESCP the most critical to the successful implementation of ESC and should be required for all earthworks and stream works operations and activities across the Project.
67. The SSESCEPs are to be approved by a defined SQEP-ESC is appropriate. I consider that it essential that ESC design and management is overseen and approved by a suitable qualified ESC expert to ensure the successful

design and implementation of appropriate and complaint ESC devices and methodologies.

68. For a large-scale infrastructure project with a significant earthworks' operation, it is the detail of the maintenance and monitoring that plays a critical role in minimising sediment related effects. How the site will be monitored and maintained to meet the expected standards needs to be specified, either provided as part of the application, or defined in detail through conditions of consent. This provides guidance as to what is expected on site in terms of the active monitoring and maintenance regime.
69. The ESCP provides a maintenance and monitoring regime, including a trigger event monitoring programme, that I consider consistent and standard for large-scale land-disturbing infrastructure projects.



Campbell Ross Stewart

20 August 2026