Before an Expert Panel **FTAA-2507-1089**
Bendigo-Ophir Gold Project

Under the	Fast Track Approvals Act 2024
In the matter of	an application for approvals to establish, operate, and remediate an open pit and underground gold mine at Bendigo and Ardgour Stations
By	**Matakanui Gold Limited** Applicant

STATEMENT OF EVIDENCE OF NICHOLAS JOHN HEAD
TERRESTRIAL ECOLOGY

10 April 2026

Environmental Defence Society Inc
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Introduction and scope

1. My full name is Nicholas John Head.

2. I have been asked by the Environmental Defence Society Inc. (EDS) to provide independent expert evidence on the terrestrial ecology values that are potentially affected by the Matakanui Gold Ltd (Bendigo-Ophir Gold Project) fast-track application, in particular:

    a. Comment on the adequacy of the applicant's ecological reports, including survey methodologies, and the identification and assessment of ecological values.
    b. Critique the assessment of actual and potential ecological effects.
    c. Consider the adequacy of the mitigation, offsetting and compensation proposed.

Qualifications and experience

3. I have a Master of Science (Hons) degree in plant ecology from Lincoln University and a BSc with a double major in plant ecology and physical geography from the University of Canterbury.

4. Since 2017 I have been employed as the Senior Ecologist for the Christchurch City Council[1]. For the previous 23 years I worked as a plant ecologist for the Department of Conservation (DOC) where I had responsibilities across the Eastern South Island. Prior to that I worked for Landcare Research New Zealand Ltd as a field botanist for the Rabbit and Land Management Programme and Semi-Arid Lands Programme, based in Alexandra.

5. I have over three decades experience working in Canterbury and throughout New Zealand undertaking ecological and botanical assessments. From a practical perspective, I have extensive field experience assessing, recording, monitoring and reporting on botanical matters throughout New Zealand, with a particular focus on threatened and rare ecosystems and plants in the eastern South Island.

6. I have substantial experience assessing and determining ecological significance. I participated in three Protected Natural Area Programme surveys in Canterbury and Marlborough that used a standard scientific approach to assess significant ecological values across large areas. I was part of an Environment Canterbury

[1] Christchurch City Council has agreed for me to undertake this work for EDS in my own time.

working party of ecologists tasked with developing ecological criteria for the Canterbury Regional Policy Statement (CRPS). I was also responsible for the preparation of DOC's best practice guidelines for assessing significant ecological values[2], which I co-authored. In addition, I have published a critique of alternative assessment approaches proposed by the Environment Institute of Australia and New Zealand (EIANZ)[3].

7. I have undertaken many botanical assessments across a wide range of scales, from areas exceeding 40,000 hectares to less than one hectare. I have surveyed many sites that form the basis of Significant Natural Areas (SNAs) in district plans, and I have oversight of those proposed for inclusion in the Christchurch City Council's district plan.

8. When working as a field botanist for Landcare Research Ltd in Central Otago for the semi-arid lands programme, I visited multiple properties through Central Otago, including Bendigo Station, as well as most properties that comprise the catchments of Lakes Wānaka and Hāwea.

9. During the Tenure Review process under the Crown Pastoral Land Act 1998 (CPLA), I undertook extensive ecological assessments across large areas of the eastern South Island high country, encompassing many hundreds of thousands of hectares. This work has provided me with a high level of familiarity with the ecological values, patterns, and processes of high-country environments. In addition to Tenure Review work, I have undertaken a wide range of statutory and planning-related ecological assessments across the eastern South Island high country, including SNA identification, CPLA assessments, and Overseas Investment Act matters, covering pastoral leasehold land and private land.

10. I have also prepared many successful proposals for land protection across the South Island high country, such as Nature Heritage Fund land purchases of Ōhau Downs Station and Tarnbrae in the Mackenzie Basin, Hakatere Station within the Hakatere Basin (Ashburton Lakes) and St James Station in North Canterbury.

11. I have a long involvement with research and management of threatened plant species and rare dryland ecosystems, such as that undertaken in the Tekapo

[2] Davis, M.; Head, N. J.; Myers, S. C.; Moore, S. H. 2016. Department of Conservation guidelines for assessing significant ecological values. Department of Conservation, Wellington, 71p.
[3] Head, N., & Grove, P. (2019). Professional practice and implementation of EcIA – issues for local authorities and biodiversity protection. New Zealand Association for Impact Assessment (NZAIA) Online Planning Journal. Available at: https://www.nzaia.org.nz/headandgrove.html.

Scientific Reserve[4], and I currently oversee dryland restoration projects at McLeans Island on the Canterbury Plains and at Kaitorete. This research involves studies on threatened species populations, ecosystem health, planting trials, and responses to various management actions over time, including sheep grazing.

12. I provide a wide range of botanical and ecological advice to colleagues and the public generally. I have published numerous articles on threatened plant species and ecosystems. I have also prepared and reviewed a substantial number of Assessments of Ecological Effects (AEE) for Resource Management Act 1991 (RMA) consents, as well as Reserves Act 1977 management plans, and restoration plans. I have presented expert evidence on ecological matters at numerous hearings at both district and regional levels, as well as in the Environment Court.

Code of conduct

13. I understand that this is not a hearing under the RMA. However, I have read the code of conduct for expert witnesses contained in the Environment Court's Practice Note 2023 (the Code). I have complied with the Code when preparing this written statement of evidence. The data, information, facts, and assumptions I have considered in forming my opinions are set out in my evidence. Unless I state otherwise, this evidence is within my sphere of expertise, and I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

Material considered

14. In preparing this evidence, I visited the site on 18 March 2026 and read the following documents. Other documents and papers are referenced in footnotes throughout this evidence.

    a. B.08 Alliance Ecology Consulting - Assessment of Ecological Effects (Alliance 2025)
    b. B.09 Habitat NZ - Mammalian Pest Survey (Habitat NZ 2025a)
    c. B.10 Habitat NZ - Native Bat Survey (Habitat NZ 2025b)
    d. B.11 Habitat NZ - Terrestrial Invertebrate Survey (Habitat NZ 2025c)
    e. B.13 RMA Ecology - Vegetation Values Assessment (RMA Ecology 2025b)

[4] Walker, S.; Comrie, J.; Head, N.; Ladley, K. J.; Clarke, D.; Monks, A, 2016b. Sampling method and sample size affect diversity and indigenous dominance estimates in a mixed grassland community. New Zealand Journal of Ecology, 40(1) 150-159.

f. B.14 RMA Ecology - Avifauna Values Assessment (RMA Ecology 2025c)
g. B.15 RMA Ecology - Lizard Values Assessment (RMA Ecology 2025d)
h. B.16 Manaaki Whenua Landcare Research - Applied Research Plan for Conservation Management, Rehabilitation and Expansion of Cushionfield (Landcare 2025).
i. E3 Scientific, Matakanui Gold Terrestrial Ecology -Technical Review Terrestrial Ecology (for Otago Regional Council), Final Response 18/03/2026. Ref:25080B.e3
j. Department of Conservation, s51 Reports dated 25 March 2026.
k. Statement of evidence of Dr Leanne Kaye Morgan (Groundwater Hydrology). Evidence prepared for the Environmental Defence Society Inc in relation to the Bendigo-Ophir Gold Project, before an Expert Panel under the Fast-track Approvals Act 2024. Dated 10 April 2026.

15. In preparing this evidence, I am aware that the Panel has issued a number of requests for further information from the applicant dated 1 April 2026, however indigenous biodiversity is not covered. My evidence has been prepared in advance of the applicant's responses being provided to the Panel and parties, including EDS. To the extent that any of those responses (or future responses) relate to my evidence I wish to reserve my ability to update my evidence in light of the additional information provided. In addition, I understand that proposed consent conditions may evolve during the fast-track process, and I request an opportunity to comment on material changes to these, again where relevant to my area of technical expertise.

16. In this evidence, I have provided a high-level review of consent conditions pending a more comprehensive analysis once I have reviewed the applicant's responses to the requests for further information, participated in expert caucusing which I understand the Panel has indicated will occur, and once the uncertainties identified in my evidence are addressed. All these things will impact the appropriateness of the consent conditions framework.

Summary

17. The proposal will result in the permanent loss of approximately 600 ha of ecologically significant habitats (sites / Environmental Management Units (EMUs[5]), supporting multiple Threatened and At-Risk taxa across all major taxonomic guilds.

[5] The term significant "habitats" is synonymous with "sites" and "environmental management units" (EMU) as originally assessed by the applicant. The terms habitats and sites are used interchangeably throughout this evidence and mean the same.

Losses include nationally significant populations of *Ceratocephala pungens* (Nationally Critical[6], and *Myosotis brevis* (Nationally Vulnerable), threatened[7] and rare ecosystems. The loss of these values would constitute major, permanent adverse effects to significant and largely irreplaceable ecological values.

18. The applicant's AEE relies on the non-statutory EIANZ framework[8] (called the EcIAG in the application), which uses a matrix method that enables the averaging down of ecological values within sites that are demonstrably ecologically significant. The scale and permanence ("magnitude") of loss have also been inappropriately reduced, including the incorporation of secondary considerations and unsupported assumptions about offsetting success, including double accounting mitigation proposals.

19. The EIANZ constructs of averaged "ecological value" and "magnitude of effect" introduce a parallel assessment framework that dilutes the direct evaluation of ecological significance and level of effect that I understand, based on prior experience, is required under the National Policy Statement for Indigenous Biodiversity 2023 (NPS-IB)[9]. When these constructs are applied together, they compound to produce an overall "level of effect" that materially understates the true severity, permanence, and irreversibility of impacts, and in doing so artificially increases the apparent feasibility of offsetting for losses that cannot be offset in principle.

20. Consequently, in my opinion, the extent and scale of residual effects that cannot be offset or compensated is substantially greater than acknowledged by the applicant's ecological assessment, which is the majority of the approximately 600 hectares directly affected by the mine**.**

21. The proposed mitigation, offsetting and compensation measures are insufficient to address the residual effects. Many of the proposed actions are speculative, research-dependent, or geographically disconnected from the impacted habitats, resulting in low confidence in ecological equivalence, permanence, and certainty of outcome. The applicant's acknowledgment that several offsetting principles are

[6] de Lange, P.J.; Gosden, J.; Courtney, S.P.; Fergus, A.J.; Barkla, J.W.; Beadel, S.M.; Champion, P.D.; Hindmarsh-Walls, R.; Makan, T.; Michel, P. 2024: Conservation status of vascular plants in Aotearoa New Zealand, 2023. New Zealand Threat Classification Series 43. Department of Conservation, Wellington. 105 p.
[7] Walker, S.; Cieraad, E.; Barringer, J. (2015). The Threatened Environment Classification for New Zealand 2012: A guide for users. Landcare Research Contract Report LC2184. Manaaki Whenua – Landcare Research, Dunedin.
[8] *Ecological impact assessment: EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems* (2nd ed.). Environment Institute of Australia and New Zealand (EIANZ), Melbourne. ISBN 978-0-9805878-3-8.
[9] Ministry for the Environment. (2023, amended 2024). *National Policy Statement for Indigenous Biodiversity (NPS-IB)* (Ref. ME 1861). Wellington: Ministry for the Environment, New Zealand.

not fully satisfied reinforces these deficiencies. As a result, the proposed package provides no assurance that residual effects can be appropriately offset or that ecological outcomes will be positive or neutral.

22. The AEE fails to clearly distinguish between biodiversity offsetting and biodiversity compensation. Measures that do not meet offsetting requirements because they are not like-for-like, are uncertain, delayed, or management-dependent, are aggregated into a combined "offset / compensation package" that obscures the failure of offsetting and masks an underlying net loss of significant biodiversity. This blurring misrepresents the true ecological outcome and weakens recognition of accepted limits to offsetting under the NPS-IB.

23. Financial contributions to DOC do not constitute biodiversity offsetting or compensation under accepted ecological principles. Such payments lack a direct linkage to the specific habitats and species affected and transfer responsibility and risk for ecological outcomes to third parties, including the consenting authority. While conservation funding may deliver broader public benefits, it does not remedy the permanent loss of site-specific significant ecological values or satisfy offsetting or compensation requirements under the NPS-IB and established good-practice principles[10].

24. In its current form, the application would result in an irreversible net loss of significant ecological values. The scale and permanence of habitat destruction cannot be effectively avoided, remedied, mitigated, or offset with reasonable credibility or certainty. Restoration or rehabilitation of equivalent ecological values is highly uncertain and unlikely to replicate the intrinsic composition, structure, ecological functions, or resilience of the ecosystems lost. Irreplaceable ecosystems of the type involved cannot be effectively offset.

25. If the project was to proceed notwithstanding these findings, acknowledgment of unavoidable, non-offsettable loss and a compensatory trading-up[11] approach at a scale commensurate with the full extent of loss would be required. Given the permanent loss of approximately 600 ha of ecologically significant habitats, this would require the permanent legal protection of no less than an equivalent area, and likely a materially larger area, of similar nationally significant dryland ecosystems elsewhere that are not currently protected by either planning

[10] Department of Conservation. (2014). *Biodiversity Offset Framework*. Wellington, New Zealand: Department of Conservation.

[11] Trading up relates to compensation used when net loss is unavoidable (so offsetting is inappropriate). In theory, if it is being relied upon it should protect ecosystems of at least equal, but preferably higher value, hence "trading up".

provisions or conservation covenants. Even then, trading up would not replace the ecosystems lost and must be clearly framed as partial compensation rather than no net loss or equivalence.

26. Ecological effects are managed primarily through future management plans and applicant-led monitoring rather than enforceable consent limits, with later mine stages, including the Come in Time pit, proceeding without any requirement to independently demonstrate ecological acceptability before irreversible loss occurs.

27. Accordingly, even under best-practice management and with all proposed measures applied, the proposal would necessarily result in an enduring and significant net loss of ecological values.

Introduction

28. The ecological values of the mine site are extensive and mostly well-documented.[12] Multiple assessments identify the site as ecologically significant, supporting a diverse range of indigenous ecosystems, specialised dryland communities, rare ecosystems, and multiple Threatened and At-Risk species across all taxonomic guilds.

29. For the purposes of this statement, I accept the existence of these botanical values as established by the applicant's assessments[13] and other ecological evidence before the Panel.[14] Accordingly, I do not repeat a detailed description of these values here.

30. This statement primarily focuses on my assessment of the applicant's AEE and propositions regarding botanical values, mitigation actions, offsetting and compensation measures, and whether these measures can credibly address the residual adverse effects of the proposal.

Vegetation Values assessment

Overview

[12] I have read and support the identified information gaps in DOC's s51 reports.
[13] RMA Ecology Ltd. August 2025. Bendigo-Ophir Gold Project: Vegetation Values Assessment. Report prepared for Matakanui Gold Ltd.
[14] For example, DOC's section 51 reports and ORC's terrestrial ecology technical report by e3 Scientific.

31. The applicant's Vegetation Values assessment [15] is generally satisfactory and provides a relatively comprehensive account of the site's[16] botanical values. The report identifies that all of the approximately 600 ha mine footprint is ecologically significant, meeting statutory significance assessment criteria. It identifies 48 plant species of conservation concern that will be directly affected by the mine operation, including an impressive number of other nationally Threatened and At-Risk taxa (insects, reptiles, birds), which in my view makes the site nationally important for indigenous dryland biodiversity.

32. The assessment also recognises the site as a national and regional stronghold for two Threatened species: *Ceratocephala pungens* (Nationally Critical) and *Myosotis brevis* (Nationally Vulnerable), both small endemic herbs, which the applicant notes comprise approximately 80% and 33% of regional populations respectively. Most of the *Ceratocephala pungens* population occurs within the proposed mining footprint of the Come in Time pit[17], requiring its inevitable permanent loss.

33. The *Ceratocephala pungens* population located in the subject site is of national significance, representing one of the largest remaining populations in New Zealand. Extensive surveys by DOC across the species' natural range of historically known sites demonstrate a dramatic contraction in its distribution, with most former populations now locally extinct or supporting declining and comparatively small numbers of plants compared to earlier records[18]. The primary driver of decline has been habitat loss, particularly through agricultural intensification, and in some cases retiring grazing resulting in increased competition with exotic grasses[19]. In this context, the population on the mine site is of exceptional conservation importance, both because of its size and because it occurs within a regionally rare and threatened cushionfield habitat[20] that also supports several other At-Risk and Threatened species. Given these values, this cushionfield habitat is effectively irreplaceable, and its loss cannot realistically be offset or compensated.

34. A substantial proportion of the proposed mine footprint, including the Come in Time pit, is subject to the Bendigo Conservation Covenant, which was established

[15] RMA Ecology Ltd. August 2025. Bendigo-Ophir Gold Project: Vegetation Values Assessment. Report prepared for Matakanui Gold Ltd.
[16] Separated into multiple Ecological Management Units (EMU) based on plant communities and geomorphology.
[17] Alliance Ecology Consulting Ltd. (2025). Assessment of Ecological Effects: Terrestrial Ecology – Bendigo-Ophir Gold Project. Prepared for Matakanui Gold Ltd. Section 4.3.2 (Nationally threatened spring annuals), p. 63.
[18] DOC Summary *Ceratocephala pungens* 20151107 & information provided by DOC Twizel biodiversity staff.
[19] Information provided by DOC technical staff.
[20] Manaaki Whenua Contract Report: LC4626. Applied Research Plan for conservation management, rehabilitation and expansion of cushion field. July 2022.

in recognition of the site's significant botanical and ecological values and with an expectation of ongoing protection in perpetuity. The proposal therefore involves the removal of formal protection of areas now targeted for mining. The exact extent of impact on the conservation covenant cannot be ascertained as the applicant has not undertaken assessments of the covenant land values, separate from broader site.

Identified gaps and limitations

35. The following methodological gaps are evident in the applicant's Vegetation Values assessment:

    a. **Non-vascular flora**: No comprehensive assessment of non-vascular plants (mosses, lichens, and other cryptograms) appears to have been undertaken. This is a methodological gap. These taxa can be important components of dryland ecosystems, although taxonomic expertise is relatively limited in New Zealand. Given the identification of multiple ecological values at the site and its assessment as comprising significant habitats, this omission will not alter the overall ecological significance of the site. However, it does potentially understate the full extent of the botanical values present and, accordingly, the adverse effects of the proposal.

    b. **Riparian margins**: Riparian areas do not appear to have been comprehensively surveyed. These edge ecotones can support notable or specialised plant assemblages and should have been included in targeted surveys, as was done for bluff habitats. This is a methodological gap that may also contribute to understating values present and consequential effects.

    c. **Spring annual surveys**: Spring annual surveys do not show the geographic extent of survey coverage. This limits the ability to verify survey completeness and assess whether additional significant spring annual populations occur within unsurveyed areas. I understand that further survey work may have been undertaken by the applicant since the application was filed. I reserve my position on that additional work.

36. As discussed further below, reliance on incomplete or uncertain survey information increases risk of undervaluing known high-quality sites, missing high-values altogether, and increases concerns regarding applicant-led monitoring.

Assessment of Ecological Effects (AEE)

37. The AEE does not provide a reliable or transparent evaluation of the ecological consequences of the proposal. In particular, the analysis understates both the ecological significance of affected sites (habitats / EMUs) and the true level of adverse effects arising from their loss.

38. A central concern is the applicant's reliance on the non-statutory EIANZ ecological impact assessment framework, which is not appropriate for the rare and unique values present on the subject site.[21] This assessment framework has the result of reducing the overall level of effects. It does so by enabling the systematic 'averaging down' of ecological values and effects at multiple stages of assessment. This approach lowers the baseline against which ecological effects are evaluated and, in my opinion, creates a misleading impression that offsetting is feasible for ecological losses that cannot be offset.

Downgrading of ecological values.

39. The first stage of the EIANZ process as applied by the applicant's experts ("*Ecological values assessment for habitat types within the ESA based on EIANZ guidelines*"[22]) involves re-assessment of sites that have already been identified as ecologically significant through initial ecological surveys documented in the Vegetation Values assessment[23]. In this re-assessment, the individual attributes that comprise the significance criteria[24] are re-scored against a higher threshold, with the outcome of consistently lowering the resulting ecological "value" scores. These reduced 'component' scores are then combined into a composite overall value, diminishing the true ecological significance of the sites.

40. This problem is compounded by the applicant's use of EIANZ "significance" criteria that are inconsistent with assessment frameworks in the Otago Regional Policy Statement (ORPS)[25] and Appendix 1 of the NPS-IB[26]. Although superficially similar

[21] Roper-Lindsay, J., Fuller, S. A., Hooson, S., Sanders, M. D., & Ussher, G. T. (2018). *Ecological impact assessment: EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems* (2nd ed.). Environment Institute of Australia and New Zealand (EIANZ), Melbourne. ISBN 978-0-9805878-3-8.
[22] Alliance Ecology Consulting Ltd. (2025). *Assessment of Ecological Effects: Terrestrial Ecology – Bendigo-Ophir Gold Project*. Table 12: *Ecological values assessment for habitat types within the ESA based on EIANZ guidelines*
[23]RMA Ecology Ltd. August 2025. Bendigo-Ophir Gold Project: Vegetation Values Assessment. Report prepared for Matakanui Gold Ltd. 103 pages + appendices.
[24] Representativeness; Rarity and Distinctiveness; Diversity and Pattern; Ecological Context.
[25] Otago Regional Council. Otago Regional Policy Statement. Policy ECO-P1: Significant indigenous vegetation and significant habitats of indigenous fauna, including associated significance criteria.
[26] Ministry for the Environment. (2023, amended 2024). *National Policy Statement for Indigenous Biodiversity (NPS-IB)* (Ref. ME 1861). Wellington: Ministry for the Environment, New Zealand, Appendix 1: Criteria for identifying areas that qualify as significant natural areas.

in structure, the EIANZ criteria redefine assessment benchmarks in ways that enable lower value scores than would arise under the statutory framework.

41. For example, in reassessing representativeness[27], the EIANZ framework introduces concepts such as "naturalness" and assesses sites against an idealised pre-human baseline, rather than assessing representativeness within the Dunstan Ecological District and its modified landscape.

42. A similar issue is identified by e3 Scientific in its ecological report for Otago Regional Council (ORC). That report notes that representativeness is the extent to which the vegetation is "typical", and it is not restricted to pre-human conditions, to best examples or to what indigenous values were pre-huma[28]. It concludes that the applicant's ecological value for representativeness is likely too low and contributes to an understatement of overall effects and an increase in net loss.

43. The remaining criteria (rarity, diversity and pattern, ecological context) are also consistently downgraded through the AEE re-evaluation, further lowering the overall ecological value assigned to the affected sites. This is despite the mine footprint occurring largely within Threatened land environments[29] and spanning relatively intact ecological sequences and gradients across altitude, landform, and geology; attributes that should result in very high rarity and ecological context scores under the ORPS and NPS-IB criteria. I provide a revised assessment of these matters at paragraphs 57 – 63 and in Table 1 below.

44. As a result, the sites that comprise the mine footprint, which include extensive areas of significant indigenous vegetation and habitats that score highly across multiple statutory criteria, including representativeness, rarity and distinctiveness, diversity and pattern, ecological context, and which support multiple Threatened and At-Risk species, are reduced to only moderate ecological value in the AEE. This redefinition of significance materially understates the importance of the affected

[27] Representativeness is a key criterion for assessing ecological significance in New Zealand. Representative sites are significant if they retain native plant communities that reflect the characteristic vegetation types of the ecological district in which they occur. In highly modified ecological districts, historical benchmarks are no longer appropriate owing to widespread ecosystem loss and modification. In such contexts, representativeness is more appropriately evaluated in relation to the best remaining examples of indigenous ecosystems within the present-day landscape. In the Otago Regional Policy Statement, *Representativeness* is defined as:

- The extent to which the area contains indigenous vegetation or habitat that is characteristic or typical of the ecological district.
- Includes ecosystems that are under-represented nationally or regionally (e.g., rare wetland types, dryland shrublands).
- Often assessed against ecological district reference conditions.

[28] E3 Scientific report, 18 March 2026, at page 14.

[29] Walker, S.; Cieraad, E.; Barringer, J. (2015). The Threatened Environment Classification for New Zealand 2012: A guide for users. Landcare Research Contract Report LC2184. Manaaki Whenua – Landcare Research, Dunedin.

sites, obscures the predominance of high-value ecological values within the mine footprint, and lowers the baseline from which adverse ecological effects are assessed.

45. Table 12 of the AEE[30] demonstrates this pattern clearly. Ecologically significant sites such as mixed tussock shrubland and mixed scrubland[31] are consistently scored low for representativeness and only moderate for other criteria under the EIANZ framework (see Appendix A of this evidence, which reproduces the relevant portion of Table 12). In my assessment, when evaluated using the significance criteria in the ORPS and Appendix 1 of the NPS-IB, these sites are highly representative of the Dunstan Ecological District, occur within Threatened and Endangered land environments, contribute to intact ecological sequences and landscape-scale processes, and exhibit high diversity and ecological context.

46. In addition, despite supporting very high numbers of Threatened and At-Risk species (33 and 22 taxa respectively), and despite meeting multiple independent indicators of ecological significance, these ecosystems are assigned only moderate overall ecological value in the AEE. In my opinion, this materially understates their true ecological significance and establishes an inappropriately low baseline for the subsequent assessment of effects, mitigation, and offsetting.

Downgrading magnitude of effects

47. Following the downgrading of ecological values, the applicant's technical assessment further reduces the severity of effects by lowering the assessed magnitude of effect[32]. This occurs in the second stage of the EIANZ methodology, where factors beyond the impact itself, such as the presence of similar habitat elsewhere and assumptions about future rehabilitation or enrichment planting, are taken into account.

48. When these assumptions are combined with the already reduced value scores, the overall "level of effect" is lowered further. Impacts that would ordinarily be assessed as high or very high are instead characterised as moderate, which in turn makes mitigation and offsetting appear more feasible than would be the case if effects were assessed based on actual loss at the impact site.

[30] Table 12: *Ecological values assessment for habitat types within the ESA based on EIANZ guidelines*. In Alliance Ecology. Assessment of Ecological Effects: Terrestrial Ecology. Bendigo-Ophir Gold Project. Pg 82-88.
[31] The application refers to these plant communities as either sites, ecological management units (EMU) or habitats.
[32] Alliance Ecology Consulting Ltd. (2025). *Assessment of Ecological Effects: Terrestrial Ecology – Bendigo-Ophir Gold Project.* Table 13: Magnitude of effects for habitat types within the ESA based on EIANZ guidelines.

49. This approach is most evident for high and very high value EMUs, including native-dominant tussockland, native-dominant scrubland, and taramea herbfield and shrubland. In each case, the proposal involves near-total and irreversible removal of habitat within the mine footprint, resulting in the long-term or permanent loss of species assemblages including Threatened and At-Risk species, ecosystem function and ecological processes. Under standard ecological practice, such outcomes would normally be assessed as having a very high magnitude of effect.

50. Instead, the applicant's technical report reduces the assessed magnitude by relying on proposals to rehabilitate, plant, or manage habitat elsewhere in the future[33]. This conflates the assessment of effects with how those effects might later be managed. Assumed future gains do not reduce the seriousness of the initial impact, particularly where recovery is uncertain, delayed, and unlikely to produce ecosystems that are functionally equivalent to those destroyed.

51. This reduction in magnitude can be seen in Table 13 of the AEE, "*Magnitude of effects for habitat types within the ESA based on EIANZ guidelines*", which explicitly allows magnitude to be moderated by reference to proposed mitigation, rehabilitation and enhancement. The moderated magnitude scores are then combined with the downgraded ecological values in Table 12 to derive the overall "level of effect", which is subsequently used to determine whether offsetting is considered appropriate or achievable.

52. As a result, offsetting is presented as feasible for ecologically significant habitats that, when assessed in accordance with the NPS-IB and regional planning framework, should instead be recognised as experiencing significant residual adverse effects that exceed accepted offsetting limits. By embedding mitigation and offsetting assumptions within the effects characterisation itself, the assessment introduces 'double accounting' that understates the true scale, permanence, and irreversibility of ecological loss and sets an inappropriately low baseline for effects assessment.

53. Even if enrichment or restoration planting were technically achievable, it cannot replicate ecological integrity[34] inherent to the ecosystems lost - the intrinsic values

[33] Alliance Ecology Consulting Ltd. (2025). AEE – Terrestrial Ecology, Table 13: Magnitude of effects for habitat types within the ESA based on EIANZ guidelines.

[34] NPS-IB defines ecological integrity as: ecological integrity means the extent to which an ecosystem is able to support and maintain its: (a) composition (being its natural diversity of indigenous species, habitats, and communities); (b) structure (being its biotic and abiotic physical features); (c) functions (being its ecological and physical processes).

of significant natural ecosystems that includes soil–plant relationships, complex species assemblages, and long-established ecological processes.

54. The vulnerability of groundwater-dependent wetland ecosystems within the mine footprint is reinforced by the groundwater hydrology evidence of Dr Leanne Morgan (2026) for EDS. Dr Morgan concludes that hydrogeological data collection and conceptualisation for the project are limited, that key parameters required to predict groundwater behaviour over time have not been measured, and that the numerical groundwater models used to assess effects are classified as low-confidence and unsuitable for high-risk developments. In this context, effects on wetlands and other groundwater-dependent habitats cannot be predicted with confidence, and there remains a material risk that the extent, duration, and severity of ecological effects are substantially greater than those assessed in the AEE for these ecosystems.

Assertion of degraded current state

55. A further concern is the narrative advanced in the AEE that significant habitats within the mine footprint are unsustainable under the status quo and will inevitably decline without mine management. This assumption is speculative and inconsistent with the applicant's own evidence, including historical aerial imagery (shown in Appendix B of this evidence), which indicates that some native vegetation communities, particularly shrublands, are expanding rather than declining[35].

Summary

56. Taken together, these factors produce an overall assessment that substantially misrepresents the true ecological value of affected sites and the severity of adverse effects on significant indigenous vegetation, habitats and species. This outcome is inconsistent with the requirements of the RMA and the effects management hierarchy in the NPS-IB, including that:

    a. Areas of significant indigenous vegetation and significant habitats of indigenous fauna must be recognised and provided for as a matter of national significance; and

[35] Alliance Ecology Consulting Ltd. (2025). *Assessment of Environmental Effects: Terrestrial Ecology – Bendigo-Ophir Gold Project*, Section 4 (Existing Environment – Vegetation Condition); Sections 6–7 (Rehabilitation and Enhancement).

b. Removal of irreplaceable or vulnerable indigenous biodiversity cannot, in the circumstances of this proposal, be adequately offset or compensated, and the activity must be avoided.

My revised assessment

57. Table 1 below reflects my assessment of ecological value, magnitude of effect, and overall level of effect. This assessment is based on a review of the applicant's ecological reports and technical evidence, consideration of the NPS-IB and regional planning framework, and observations from my site visit.

58. While I do not accept the EIANZ matrix-based assessment approach as an appropriate or sufficient method for determining ecological effects for the subject site, I have applied it here for comparative purposes to demonstrate that, even using the applicant's chosen framework, the overall level of ecological effects is materially higher than what the applicant has assessed.

59. This provides a more accurate and precautionary characterisation of ecological effects, consistent with the NPS-IB and, in the case of wetlands, the National Policy Statement for Freshwater Management 2020 (NPS-FM)[36].

60. Consistent with my earlier critique of the applicant's significance assessment above, I have assigned ecological values using the statutorily required criteria in the ORPS and Appendix 1 of the NPS-IB. Magnitude of effect has been assessed based on the actual outcomes within the mine footprint, including scale of loss, duration, irreversibility, and recovery uncertainty, without discounting effects through assumed mitigation, rehabilitation, or offsetting.

61. For all natural inland wetland types, habitats occurring on Threatened land environments[37], and those that support multiple Threatened and At Risk species, are assessed as very high ecological value and very high magnitude of effect, reflecting their inherent rarity, functional significance, sensitivity to disturbance, and national policy direction of no further loss[38].

62. Dr Morgan's evidence further supports a conclusion that accepted limits to biodiversity offsetting are exceeded for groundwater-dependent ecosystems. She

[36] Ministry for the Environment. (2020, amended 2025). *National Policy Statement for Freshwater Management 2020 (NPS-FM).* New Zealand Government. In force from 3 September 2020.
[37] Walker, S.; Cieraad, E.; Barringer, J. (2015). The Threatened Environment Classification for New Zealand 2012: A guide for users. Landcare Research Contract Report LC2184. Manaaki Whenua – Landcare Research, Dunedin.
[38] Ministry for the Environment. (2020, amended 2025). *National Policy Statement for Freshwater Management 2020 (NPS-FM).* New Zealand Government. In force from 3 September 2020.

identifies a high likelihood of irreversible impacts to wetlands from mine dewatering and groundwater drawdown, particularly in the Rise and Shine catchment, and considers permanent wetland loss to be the likely outcome. Proposed mitigation measures, including flow augmentation, are described as speculative and untested, and no mitigation is proposed for some wetland types. These findings reinforce that residual adverse effects exceed those acknowledged in the AEE.

63. When value and magnitude are properly characterised, the resulting overall levels of effect are very high for most indigenous ecosystems affected by the proposal, demonstrating that the adverse effects are significant and, in most cases, exceed accepted limits to offsetting.

Table 1: *Revised assessment of ecological values, magnitude of effect, overall level of effect, and offsetting feasibility, compared with the Applicant's EIANZ-based assessment (AEE Tables 12 and 13, shown in brackets)*[39]

Ecological Management Unit (EMU)	**Correct ecological value**	**Correct magnitude of effect**	**Correct overall level of effect**	**Offsetting feasibility**
Exotic pasture / herbfield (79ha)	Low (low)	High (High)	Low–Moderate (Low–Moderate)	Offset/rehabilitation appropriate (Offsetable)
Mixed tussock shrubland and exotic grassland (187ha)	High-Very High (Moderate)	Very High (Moderate)	Very High (Moderate)	Not offsetable, exceeds accepted limits (Offsetable)
Mixed scrubland (124ha)	High-Very High (Moderate)	Very High (Moderate)	Very High (Moderate)	Not offsetable, exceeds accepted limits (Offsetable)
Native-dominant tussockland (25ha)	High-Very High (High)	Very High (Moderate)	Very High (Moderate)	Not offsetable, exceeds accepted limits (Offsetable)
Native-dominant scrubland (86ha)	Very High (Very high)	Very High (Moderate)	Very High (Moderate)	Not offsetable, exceeds accepted limits (Offsetable)

[39] Applicant ecological value, magnitude of effect, and overall level of effect scores are derived from Alliance Ecology Consulting Ltd. (2025), *Assessment of Ecological Effects: Terrestrial Ecology – Bendigo-Ophir Gold Project*, Section 7.2, Table 12 (Ecological values assessment for habitat types within the ESA) and Section 7.3, Table 13 (Magnitude of effects for habitat types within the ESA), and the resulting overall level of effect derived under the EcIAG framework.

Taramea herbfield and shrubland (2ha)	Very High (High)	Very High (Moderate)	Very High (Moderate)	Not offsetable, exceeds accepted limits (Offsetable)
Mixed depleted herbfield (cushionfield)	Very High (Very high)	Very High (High)	Very High (high)	Not offsetable, exceeds accepted limits (Not offsetable)
Seepage wetlands	Very High (Moderate)	Very High (Moderate)	Very High (Moderate)	Not offsetable, exceeds accepted limits (Offsetable)
Fen wetlands	Very High (Moderate)	Very High (Moderate)	Very High (Moderate)	Not offsetable, exceeds accepted limits (Offsetable)
Swamp / marsh wetlands	Very High (High)	Very High (Moderate)	High (Moderate)	Not offsetable, exceeds accepted limits (Part Offset)

Assessment of effects on individual species

64. A related concern arises in the AEE on individual Threatened and At-Risk species[40]. As with habitats, the applicant's technical report's use of the EIANZ framework results in a systematic and inappropriate moderation of the assessed magnitude of effect, with the consequence that the severity and permanence of species impacts are understated. The same methodological pattern is evident as at the habitat scale, where ecological values are reduced through re-scoring in Table 12 and magnitude of effects is further moderated in Table 13 by reference to assumed mitigation, rehabilitation, and wider population persistence.

65. The AEE identifies very high numbers of Threatened and At-Risk taxa associated with the mine footprint, including over 30 Threatened taxa and more than 20 At-Risk taxa across all guilds. For many of these Threatened and At-Risk species, the proposal will result in substantial or complete loss of occupied habitat within the mine footprint, direct mortality or displacement of individuals, and the loss of locally important populations that contribute to regional or national persistence. Under accepted ecological practice, such outcomes would normally be characterised as having a high to very high magnitude of effect, particularly where

[40] Alliance Ecology Consulting Ltd. (2025). Assessment of Ecological Effects: Terrestrial Ecology – Bendigo-Ophir Gold Project. Prepared for Matakanui Gold Ltd. Table: Threatened and At-Risk species recorded or potentially affected within the Ecological Study Area / Direct Disturbance Footprint, and associated text in Section 4.3 (Ecological values – species).

populations are spatially restricted, dependent on specialised habitats, or reliant on uncertain recovery pathways.

66. Despite this, the assessment frequently assigns low to moderate magnitude ratings by relying on factors that do not materially reduce the effect on the affected populations. These include the presence of the species elsewhere in the wider ecological district, assumptions that future habitat enhancement or predator control will generate offsetting or compensatory benefits, and expectations that individuals can be salvaged or re-established over time. This approach conflates impact assessment with proposed mitigation and shifts attention away from the immediate and enduring consequences of habitat loss and population loss or displacement at the site of impact.

67. The assessment also dilutes magnitude through broad-scale spatial comparisons. Moderating effects on the basis that a species persists elsewhere fails to recognise that the loss of habitat supporting nationally or regionally significant population clusters, source populations, or high-density occurrences within a fragmented landscape, represents a substantial ecological impact, irrespective of regional persistence.

68. As with habitats, reliance on uncertain future management methods understates the relevant effects. Anticipated success of research, translocation, planting, or long-term management may be relevant to proposed responses to effects, but does not diminish the certainty of initial loss, the length of recovery timeframes, or the risk that recovery may not occur. Where recovery is uncertain or requires high levels of management and intervention, magnitude of effect should be elevated rather than reduced.

69. The assessment of cushionfield spring annuals demonstrates that a more precautionary approach is possible, recognising very high value, high to very high magnitude, and limits to offsetting. Similar considerations should apply to varying degrees, to other Threatened plants, invertebrates, reptiles, and birds affected by the proposal, yet are not consistently reflected in the magnitude ratings assigned.

70. Overall, the systematic moderation of magnitude of effect at the species level contributes to a reduced combined level of effect and supports conclusions that offsetting or compensation is sufficient. This mirrors the issues identified at the habitat level and reinforces the conclusion that the AEE understates the true ecological consequences of the proposal for both ecosystems and the species they support.

Proposed offsetting and compensation

71. The financial contribution to DOC is not considered part of the biodiversity offsetting or compensation response. As acknowledged by the applicant, this contribution is not offsetting or compensation and does not remedy residual ecological effects. The assessment below therefore considers the adequacy of the proposed offsetting and compensation measures independently of the DOC contribution.

72. Much of what the applicant presents as offsetting does not meet accepted offsetting requirements and has been mischaracterised. At best, these measures are compensatory in nature and therefore confirm, rather than resolve, substantial ecological loss that cannot be offset.

73. This mischaracterisation arises because the proposed offsetting and compensation package is substantially flawed. Its design is predicated on an AEE in which both ecological values and the magnitude of residual effects have been systematically downgraded, as outlined in the preceding sections. Under the NPS-IB, and in particular the biodiversity offsetting principles in Appendix 3, the adequacy of an offset package depends on an accurate characterisation of ecological values and residual effects. Where that underlying characterisation is flawed, any offsetting response derived from it is necessarily unreliable and incapable of addressing the true scale of impact.

74. Even from this reduced baseline, the AEE acknowledges that some habitats and species of very high ecological value, most notably cushionfield habitat supporting *Ceratocephala pungens,* will suffer permanent and irreplaceable loss that cannot be fully offset. However, as demonstrated by my assessment of ecological value, magnitude, and overall level of effect set out in Table 1 above, a wider range of affected ecologically significant habitats (EMUs) are also subject to high or very high residual adverse effects that, when properly characterised, similarly exceed accepted limits to offsetting as contemplated by Appendix 3 of the NPS-IB. While the applicant does not explicitly identify these additional EMUs as irreplaceable, this reflects the prior understatement of value and magnitude within the AEE rather than any genuine difference in offset feasibility. In these circumstances, the proposed offset measures cannot fully account for, replace, or remediate the residual adverse effects of the proposal.

75. When assessed directly against the limits to offsetting set out in Appendix 3 of the NPS-IB, including considerations of irreplaceability, ecological equivalence, certainty of outcome, and the scale and permanence of loss, many of the residual

adverse effects identified in the corrected assessment in Table 1 above exceed what can appropriately be addressed through offsetting. Those limits apply irrespective of the quantum of enhancement proposed elsewhere and confirm that some impacts are inherently not able to be offset in principle.

76. The AEE describes the proposed offset / compensation package as "generally meeting" accepted ecological offsetting principles[41]. This phrasing is imprecise and implies compliance with the principles in Appendix 3 of the NPS-IB that is not supported by the evidence. Several core principles, particularly those relating to irreplaceability, ecological equivalence, certainty of outcome, and limits to offsetting, are not satisfied, a fact the applicant explicitly acknowledges in the AEE in relation to some values, most notably cushionfield habitats and associated Threatened plant species, where full like-for-like offsetting is accepted as not achievable[42].

77. Notwithstanding this acknowledgement, the AEE continues to present the offset / compensation package in optimistic terms, relying on speculative or uncertain gains, research-dependent actions, and ecological benefits occurring outside the mine footprint, as outlined in the biodiversity offsetting and compensation sections of the AEE.[43] Taken together, this approach creates an impression that the package is more robust and capable of addressing residual adverse impacts than is warranted under the NPS-IB framework. Once offsetting is accepted as infeasible for some high-value ecosystems, the remaining measures must properly be characterised as compensation for acknowledged net loss, rather than as offsetting that "generally meets" Appendix 3 principles.

78. This impression is reinforced by a lack of clarity in the AEE between biodiversity offsetting (Appendix 3 of the NPS-IB) and biodiversity compensation (Appendix 4 of the NPS-IB). I set out the differences between these two appendices in Appendix C of this evidence.

[41] Page 18–19 of the applicant's AEE states that while the offset/compensation package is "generally consistent" with NPS-IB principles, certain principles, notably "limits to offsetting/compensation", are unlikely to be satisfied for some species and habitat types, due to irreplaceability, significance of effects, and technical infeasibility.

[42] Alliance Ecology Consulting Ltd. (2025). Assessment of Ecological Effects: Terrestrial Ecology – Bendigo-Ophir Gold Project, pp. 18–20 and p. 176.

[43] Alliance Ecology Consulting Ltd. (2025). Assessment of Ecological Effects: Terrestrial Ecology – Bendigo-Ophir Gold Project, pp. 18–20 (offsetting and compensation assessment) and pp. 140–144 (Table 29: Biodiversity outcomes), where the applicant acknowledges that accepted offsetting principles are not fully met for some values, but nonetheless presents a combined offset / compensation package relying on speculative or uncertain gains, research-dependent actions, and ecological benefits occurring away from the mine footprint.

79. While the NPS-IB treats these as distinct responses with different purposes and thresholds, the AEE frequently presents them as components of a combined "offset / compensation package"[44]. Measures that do not meet the requirements for offsetting because they are not like-for-like, are uncertain, delayed, or management-dependent are presented alongside other mitigation measures, such as avoidance, minimisation, or on-site rehabilitation. By aggregating these fundamentally different responses into a single "offset / compensation package", the AEE obscures the fact that true offsetting as contemplated by Appendix 3 of the NPS-IB has not been achieved. Appendix 4 is implicitly relied upon without clearly acknowledging that a net loss of significant indigenous biodiversity has occurred.

80. The limitations of the offset package are compounded by the incomplete application of the effects management hierarchy. The NPS-IB makes clear that offsetting and compensation are measures of last resort, to be considered only after avoidance, minimisation, and remediation have been fully addressed. In this case, the mine footprint contains extensive areas of ecologically significant habitat that, by the applicant's own assessment of effects, cannot be avoided, including rare cushionfields, wetlands, bluffs, and populations of nationally threatened species. In this context, offsetting and compensation are being used to justify habitat loss, rather than to respond to residual effects after higher-order steps in the hierarchy have been fully applied.

81. The principle of like-for-like replacement, which underpins biodiversity offsetting in Appendix 3, is also inadequately addressed. While the applicant appropriately acknowledges that cushionfield habitat supporting *Ceratocephala pungens* exceeds accepted limits to offsetting[45], the same scrutiny is not applied to other affected habitats and species that are similarly site-specific and ecologically specialised, owing to the downgrading of values and effects as discussed earlier.

82. This is evident across a range of affected ecosystems that are similarly site-specific and specialised. Wetlands, bluffs, and native-dominant shrubland and tussock EMUs within the mine footprint support complex species assemblages, including multiple Threatened and At-Risk species, that reflect fine-scale variation in soils, hydrology, microclimate, and disturbance regimes. In addition to threatened cushionfield species such as C*eratocephala pungens* (Nationally Critical), *Myosotis*

[44] Alliance Ecology Consulting Ltd. (2025). *Assessment of Ecological Effects: Terrestrial Ecology – Bendigo-Ophir Gold Project*, pp. 17–19 and pp. 140–144, where measures responding to residual ecological effects are repeatedly described collectively as a combined "offset / compensation package", including for values where accepted biodiversity offsetting principles are acknowledged as not fully met.
[45] Alliance Ecology Consulting Ltd. (2025). *Assessment of Ecological Effects: Terrestrial Ecology – Bendigo-Ophir Gold Project*, pp. 18–20 and p. 176.

brevis (Nationally Vulnerable), this includes associated herbfield assemblages (e.g. *Raoulia* spp., *Leptinella* spp., *Pygmaea* spp.), and native-dominant shrubland and tussock species such as Aciphylla spp. (taramea), *Celmisia* spp. These dryland plant communities cannot be authentically recreated through planting or habitat enhancement elsewhere. Consequently, the proposed offsets cannot replicate the ecological composition, structure, or function of the natural ecosystems being lost, notwithstanding their treatment as being able to be offset within the AEE.

83. Additionality, required under both Appendix 3 (offsetting) and Appendix 4 (compensation) of the NPS-IB, is uncertain. A substantial proportion of the proposed actions, including weed control and predator management, represent standard land-management practices expected to occur, certainly within the Bendigo Conservation Covenant, and may occur irrespective of the proposal, albeit potentially on a less systematic basis. Where benefits are not demonstrably additional to what would otherwise occur, they cannot legitimately be credited as offsets or compensation. These concerns are amplified by reliance on research outcomes that have yet to be demonstrated and by the applicant's acknowledgment that some native shrubland communities are already expanding independently of the proposed measures.

84. Certainty of outcome, a core requirement of Appendix 3 (offsetting), is also lacking. I am not aware of any well-documented examples of successful restoration of comparable dryland ecosystems and associated species assemblages at the scale proposed, not least on substantially altered terrain post mining. Many elements of the package are therefore experimental or contingent rather than proven or reliable.

85. Timeframes and permanence further undermine the package. Ecological losses within the mine footprint are immediate and permanent, while any gains from planting or habitat enhancement, if achieved at all, would occur only over decades and remain dependent on ongoing active management. Both Appendix 3 and Appendix 4 of the NPS-IB recognise that long time lags and management-dependent outcomes weaken claims of equivalence and do not adequately address permanent loss.

86. Issues of leakage and prioritisation also arise, contrary to offsetting principles in the NPS-IB appendices. Restoration and enhancement efforts inevitably favour certain species or habitats over others, meaning that some ecological values may benefit at the expense of higher-priority values that are irreplaceably lost within the mine footprint.

87. As a result, even with extensive enhancement across approximately 2,219 ha of surrounding land, residual adverse effects on the full extent of severely affected habitats and species remain permanent and cannot be offset in accordance with Appendix 3 of the NPS-IB. Quantitative metrics such as hectares rehabilitated, numbers of individuals planted, or the extent of predator-controlled land do not replicate ecological integrity and cannot substitute the intrinsic values and complexity of naturally developed ecosystems that will be lost.

88. While the offset and compensation package proposes extensive rehabilitation within the Direct Disturbance Footprint and enhancement of surrounding areas, this does not alter the fundamental outcome of permanent ecological loss. As noted, the proposed measures rely on speculative and research-dependent gains and on benefits occurring away from the impact site, all of which are underpinned by a downgraded assessment of ecological values and residual effects. The applicant's acknowledgment that it is not possible to fully offset the loss of cushionfields confirms that, regardless of the scope of the package, the proposal will result in unavoidable and permanent loss of irreplaceable habitats and species.

89. Under the NPS-IB, offsetting and compensation are not appropriate when the indigenous biodiversity affected is irreplaceable or vulnerable, where the effects are potentially irreversible, and where net gain cannot be achieved within acceptable timeframes. This is the case here and, in my opinion, the application conflicts with the limits to offsetting and compensation set out in the NPS-IB appendices. Avoiding the activity affecting the indigenous biodiversity is therefore, in my opinion, warranted.

Critique of financial contribution to DOC

90. The applicant has proposed a $5 million contribution to DOC to support ecological work elsewhere. This does not constitute an adequate response to irreplaceable ecological losses within the mine footprint. As with the proposed offsetting package, the contribution is predicated on an AEE that understates ecological values and the scale of residual adverse effects. When the full and more accurate extent of loss is recognised, including the permanent loss of approximately 600 ha of ecologically significant habitats, a general financial contribution cannot remedy or meaningfully address the ecological consequences of the proposal.

91. The proposed contribution to DOC shifts responsibility for addressing ecological outcomes from the applicant to a third party, rather than directly protecting or restoring the nationally significant populations and site-specific habitats that would be destroyed. Effective biodiversity offsetting or compensation requires a

clear and demonstrable linkage between specific residual effects and the actions proposed in response. A financial payment to DOC lacks this ecological and spatial linkage and does not address the loss of ecosystems, species assemblages, or ecological processes removed within the mine footprint.

92. Outcomes funded through such a contribution are uncertain and contingent on factors including land tenure, DOC priorities, ecological variability, ongoing management, and sustained resourcing. There is no assurance that ecological benefits would be achieved or maintained, nor that any gains would be directed toward values comparable to those lost or that persist for equivalent timeframes. Most importantly, irreplaceable values, including nationally significant populations and specialised cushionfield, scrubland, tussockland, and wetland ecosystems, cannot be relocated or compensated for through monetary payments. They require avoidance and protection at source; they cannot be transferred elsewhere or resolved through financial contributions.

93. While conservation funding may support broader environmental initiatives, the applicant has correctly acknowledged that the DOC contribution is neither biodiversity offsetting nor biodiversity compensation. However, its inclusion within the broader effects narrative contributes to an impression that residual ecological effects have been responsibly addressed. In reality, the contribution provides no ecological equivalence, no certainty of outcome for affected values, and no reduction in the scale or permanence of loss.

94. I recommend that the DOC contribution should be treated explicitly as discretionary enhancement funding, not as a response to residual ecological effects. It should be clearly separated from any discussion of offsetting or compensation and should not be relied upon, directly or indirectly, to support conclusions about environmental acceptability.

Compensation and "trading up"

95. In addition to the inadequacy of the proposed offsetting response and noting that the DOC contribution does not address residual effects, biodiversity compensation is not a credible or sufficient response to the ecological losses associated with the proposal. Compensation does not replace or restore the specific ecological values lost but instead delivers alternative ecological benefit elsewhere. Where impacts involve the permanent loss of ecologically significant habitats and nationally significant populations of species, particularly values that are irreplaceable, compensation is not appropriate in accordance with principle 2 of Appendix 4 of

the NPS-IB. It cannot achieve ecological equivalence or maintain biodiversity outcomes at the affected site.

96. After measures to avoid and minimise adverse effects, the project would result in the permanent loss of approximately 600 ha of ecologically significant habitats (as per Table 1). In addition, direct and indirect effects would result in the loss of 2.42 ha of swamp / marsh wetlands, 0.19 ha of seepage wetlands, and 0.84 ha of gully fen wetlands, together with the loss of individuals of multiple Threatened and At-Risk plant and other species. These figures do not account for additional unmeasured edge effects, arising from habitat fragmentation and increased disturbance (dust etc) adjacent to the mine footprint, all of which are expected to further degrade ecological condition beyond the areas of direct habitat loss. As a result, the actual extent and severity of ecological effects are likely to be materially greater than indicated by loss figures alone.

97. The loss of these ecologically significant habitats and species at the mine site occurs at a landscape scale and exceeds accepted limits to compensation. These ecosystems are dependent on specific soils, landforms, hydrological regimes, and long-established ecological processes, such that their ecological integrity cannot be compensated once destroyed.

98. Avoidance and minimisation must therefore remain the primary management responses. Treating offsetting, compensation, or financial contributions as the principal solution materially understates the permanence and significance of the loss and is inconsistent with established ecological principles and the effects management hierarchy. While the AEE claims net gain outcomes for some ecosystem types and species, the applicant's own assessment acknowledges permanent and non-offsettable loss for the most ecologically significant and irreplaceable values. In this context, any overarching claim of "no net loss" or "net gain" is not scientifically or ecologically credible. The proposal would result in a substantial and permanent net loss of significant ecological values that cannot be meaningfully mitigated or offset.

99. While I do not consider that the application can meet the compensation principles of the NPS-IB, and principle 2 in particular, if the project was to proceed notwithstanding these findings, the only defensible pathway would be a clear and explicit acknowledgment that losses across the full extent of affected habitats are unavoidable, irrecoverable, and non-offsettable, and that conventional like-for-like offsetting is infeasible. In those circumstances, the only potential response would be "trading-up" by securing and permanently protecting other nationally

significant dryland ecosystems that are currently vulnerable to loss or degradation on private or leasehold land.

100. Crucially, any trading-up response must be commensurate with the scale of loss. Given the permanent loss of approximately 600 ha of ecologically significant habitats, in my opinion trading up would require, at a minimum, the permanent legal protection of no less than an equivalent area of nationally significant dryland ecosystem. This represents an appropriate baseline to maintain proportionality between loss and compensatory action. Moreover, because many of the habitats and species lost are of very high ecological value and are effectively irreplaceable, protection of an equivalent area would still under-compensate for the loss, such that a materially larger area would likely be required to deliver any meaningful conservation benefit at a national scale.

101. Trading-up would not replace what is lost within the mine footprint and must not be presented as achieving no net loss or ecological equivalence. At best, it could deliver a compensatory conservation outcome by securing other high-value ecosystems that would otherwise remain at risk. For such an approach to have integrity, it would require permanent and binding legal protection, active and sustained management, and guaranteed long-term funding. Even then, it would represent compensation for unavoidable loss, rather than true replacement of the ecological values destroyed.

102. Even with such a commitment, the proposal would result in a clear, enduring, and explicitly acknowledged net loss of nationally significant biodiversity.

Conditions and monitoring

103. The application's conditions package is largely management-plan driven, with most substantive mechanisms for managing ecological effects delegated to a suite of ecological management plans, including vegetation, fauna, habitat impact, and rehabilitation plans, rather than being controlled directly through enforceable outcome-based consent conditions. While the conditions require these plans to be prepared, implemented, and reported on, they generally do not specify clear limits, thresholds, or decision points that would constrain further ecological loss if outcomes were not achieved.

104. For example, this is illustrated by Condition 111 governing progression of the Come-in-Time pit, which relies on applicant-led monitoring and applied research rather than a binding ecological decision point before irreversible loss occurs. More generally, uncertainty is addressed through monitoring, reporting, and adaptive

amendment of management plans, rather than through consent conditions that require activities to be halted, modified, or reconsidered if ecological objectives are not met. As a result, ecological effects are managed primarily through plan performance and monitoring, rather than secured through binding conditions, increasing the risk that ecological loss proceeds without effective regulatory control.

105. Within this framework, the management plans function largely as implementation documents, describing approaches, methods, and monitoring programmes rather than setting enforceable controls on ecological loss. Certification of the plans confirms that objectives and methods have been identified but does not ensure that those objectives are ecologically robust, achievable, or will be achieved in practice, particularly in the absence of independent peer review. Where outcomes are not met, the conditions framework consistently defaults to review and amendment of ecological management plans, rather than requiring avoidance of further damage or imposing constraint on ongoing activities.

106. This is evident in conditions requiring monitoring and periodic review of vegetation, fauna, habitat impact, and rehabilitation plans, where under-performance is addressed through plan revision rather than through enforceable limits or cessation of activities. This approach is most clearly illustrated by Condition 111, but the same pattern is repeated elsewhere through adaptive management provisions that lack clear thresholds or stop-go triggers.

107. For example, the Landscape and Ecological Rehabilitation Management Plan, are framed at a high level, describing intended objectives and broad methods but lacking clear, measurable performance standards or thresholds against which success or failure can be independently assessed. Where monitoring identifies under-performance, the framework provides for further management and amendment of the plan, rather than imposing constraints on ongoing activities.

108. Taken together, the conditions accept permanent ecological loss by relying on future plans, monitoring, and adaptive responses that cannot prevent or reverse the loss of irreplaceable habitats. Uncertainty is treated as something to be managed later rather than as a reason to avoid further damage now. As framed, the conditions do not provide a robust or precautionary basis for managing ecological effects, and they significantly understate the scale and seriousness of residual effects that cannot be offset.

109. With respect to the Come in Time pit, the consent conditions envisage that future ecological monitoring, applied research, and rehabilitation trials will inform

confidence in outcomes, including the feasibility of restoration and the relative significance of affected populations of *Ceratocephala pungens* and *Myosotis brevis*. However, this information gathering occurs after approval, and the conditions do not require that key ecological uncertainties be resolved, or that ecological acceptability be demonstrated, before irreversible loss occurs.

110. For example, although Condition 111 sets out criteria under which the pit may proceed, determinations of whether "net gain" has been achieved or whether affected populations comprise less than 1 percent of the wider ecological district population rely primarily on applicant-led monitoring, research and interpretation.

111. The condition does not require an independent decision by the consent authority, based on explicit performance standards and verified evidence, before mining can proceed. In the absence of such a decision checkpoint, ecological monitoring functions to inform and document outcomes and to refine management responses, rather than to determine whether further ecological damage should proceed.

112. A further concern is the reliance on wider landscape-scale survey data for *Ceratocephala pungens* to reduce the perceived importance of the Come-in-Time population. The assessment suggests that identifying populations elsewhere reduces the significance of the Come-in-Time site. This approach relies on potentially unreliable survey data and does not reflect the actual conservation value of the Come-in-Time population, which is large, intact, and functionally important within a rare ecosystem. In this way, uncertain information from elsewhere could be used to undervalue a known, high-quality population at the Come-in-Time site, rather than to support its protection.

113. Whilst I agree with the conclusion of the independent technical review prepared for Otago Regional Council that the application falls short of "good ecological practice" due to the "irreplaceability and vulnerability"[46] of indigenous biodiversity (and therefore should be avoided), I nonetheless provide the following comment on how the applicant's conditions framework could be strengthened so that ecological protection is secured through enforceable conditions, independent oversight, and precautionary decision-making, rather than deferred to future plans and applicant led processes.

114. First, consent conditions must specify clear, measurable ecological outcomes, including performance standards and limits. Management plans should be limited

[46] e3 Scientific (2026). *Matakanui Gold Ltd – Bendigo-Ophir Gold Project: Terrestrial Ecology Technical Review for Otago Regional Council*, Sections addressing assessment methodology, ecological significance, and offsetting limits, Final Report dated 18 March 2026

to describing how those condition-mandated outcomes will be implemented, not whether they will apply or be modified over time.

115. Second, all ecological management plans must be approved following independent expert peer review, not merely certified. Independent review must test whether proposed methods are ecologically credible, conservative, and capable of achieving the required outcomes.

116. Third, an independent panel of ecological experts should be established to:

a. approve ecological management plans prior to implementation;
b. review annual monitoring and rehabilitation reports;
c. critique progress against performance standards; and
d. advise the consent authority on whether ecological outcomes are being credibly achieved.

117. The panel must be independent of the applicant, and not involved in preparing the application or management plans. Its role must be advisory to the consent authority, not to the consent holder.

118. Fourth, the conditions must introduce a clear decision gateway for the Come-in-Time pit, such that progression is contingent on independently verified ecological performance and reconsideration of effects. Monitoring must inform decisions, not simply document outcomes after decisions have already been made.

119. Finally, the conditions must require explicit separation and reporting of biodiversity offsetting, biodiversity compensation, and non-offsetable residual loss, so that permanent ecological loss is transparently acknowledged and not masked within aggregated “offset / compensation” packages.

120. Together, these measures would shift the framework from managing the consequences of ecological loss after it occurs to controlling whether further irreversible loss is allowed to occur, under an adaptive management framework, which is essential where values are rare, site-specific and irreplaceable.

121. The inadequacy of a plan-driven, adaptive management framework is reinforced by the groundwater evidence of Dr Morgan [47] . Dr Morgan concludes that uncertainty regarding groundwater behaviour remains high, that impacts to wetlands and connected systems may be irreversible, and that adaptive

[47] Morgan, L. K. (2026). *Statement of evidence of Dr Leanne Kaye Morgan (Groundwater Hydrology).*

management is inappropriate where lag times are long and remediation may be impossible. In these circumstances, deferring control of ecological effects to future monitoring and management-plan revision does not provide a precautionary or effective regulatory response to the risks identified.

Comments on the ORC technical review

122. The technical review [48] undertaken on behalf of ORC identifies flaws in the applicant's ecological assessment that are consistent with my evidence, particularly the systematic downgrading of ecological values and magnitude of effects.

123. However, I do not agree that the AEE has been prepared in accordance with accepted best practice[49]. In my opinion, and for the reasons I have outlined in relation to the EIANZ framework, the assessment departs materially from best practice for this site. This flawed methodology underpins the underestimation of ecological values and effects throughout the assessment. While I have adopted a different position on the EIANZ guidelines to the ORC experts, there remains substantial commonality on the underlying issues with the applicant's expert AEE and assessment.

124. ORC's technical review also identifies discrepancies between the Vegetation Values assessment and the AEE, including the reduction of vegetation community values from high to moderate without adequate justification. I agree with this conclusion. The treatment of key attributes such as representativeness, diversity and pattern, and ecological context does not align with standard ecological practice within the ecological district and results in a significant underestimation of ecological value and potential loss.

125. The assessment of magnitude of effect is similarly problematic. The review notes a lack of supporting information for proportional loss at the ecological district scale and reliance on unsubstantiated assumptions, particularly for threatened plant species. It concludes that effects on cushionfield and associated herbfield habitats are likely to be very high, reflecting both the scale of loss and the experimental nature of proposed rehabilitation. This reinforces my view that the assessment relies on optimistic and unproven assumptions rather than a precautionary, evidence-based approach.

[48] Matakanui Gold Terrestrial Ecology -Technical Review Terrestrial Ecology, Fina Response 18/03/2026. E3 Scientific. Ref:25080B.
[49] e3 Scientific (2026). Matakanui Gold Ltd – Bendigo-Ophir Gold Project: Terrestrial Ecology Technical Review for Otago Regional Council. Final Report dated 18 March 2026, Pg 13, Ecological Impact Assessment (B.08), 1st paragraph.

126. For the reasons set out above in my evidence, I agree with the conclusions of the ORC technical review that the application if approved will result in a substantial, permanent, and irreversible net loss of ecological values, including irreplaceable habitats such as cushionfields, herbfields, wetlands, Threatened and At-Risk species.

Conclusions

127. The mine footprint encompasses extensive significant ecological values, including approximately 600 ha of ecologically significant habitats supporting multiple Threatened and At-Risk taxa across all major guilds. This includes nationally significant populations of Threatened species, most notably the *Ceratocephala pungen*s population within rare cushionfield habitats. The botanical assessments clearly demonstrate that these values are of very high conservation importance, and that several affected ecosystems and populations are effectively irreplaceable on any meaningful ecological timeframe.

128. The applicant's AEE is methodologically flawed and systematically understates both ecological values and the magnitude of adverse effects. This has occurred through reliance on the non-statutory EIANZ framework which is an inappropriate methodology to apply at this site, misapplication of assessment criteria, and the use of quantity-based metrics (such as planting area or numbers of individuals) that overstate the appearance of ecological gains. Critically, the assessment conflates the characterisation of effects with proposed mitigation and offsetting, thereby reducing the perceived magnitude of permanent habitat loss and incorrectly presenting offsetting as more feasible than is scientifically or ecologically justified.

129. The proposed offsetting and compensation measures are aspirational and fundamentally inadequate. When evaluated against offsetting principles, including adherence to the mitigation hierarchy, like-for-like replacement, additionality, certainty of outcome, permanence, and appropriate timeframes, the package fails on multiple fronts. Many of the affected values are irreplaceable, restoration outcomes highly uncertain, and any claimed gains are contingent on intensive ongoing management rather than being self-sustaining natural systems.

130. In my opinion, the proposal would result in a substantial, permanent, and irreversible net loss of significant ecological values. The combination of systematic methodological errors in the applicant's assessment and the failure of the proposed offsetting and compensation measures demonstrates that the adverse

effects of the project cannot be avoided, remedied, mitigated, offset or credibly compensated within accepted ecological frameworks.

131. Given the irreplaceable nature of the habitats affected, particularly cushionfields, wetlands, other specialised dryland ecosystems and the species they support, the only potentially credible response, if the project were to proceed despite these findings, would be an explicit acknowledgment of unavoidable and non-offsettable loss and a compensatory "trading up" approach. Even this would not replace the specific composition, structure, functions, or species assemblages of the ecosystems and habitats lost, and must not be portrayed as achieving no net loss or ecological equivalence. Rather, any trading-up response could at best represent partial compensation for unavoidable loss, and the proposal would still result in an enduring net loss of nationally significant biodiversity.

132. The consent conditions adopt a largely management plan driven approach to ecological effects, with most substantive controls delegated to future management plans, monitoring, and adaptive responses rather than secured through enforceable outcome-based conditions. While extensive plans and reporting are required, the framework relies heavily on applicant-led implementation and interpretation, with limited independent scrutiny and no effective decision gateways where outcomes are uncertain or not achieved.

133. Progression of later mine stages, including the Come-in-Time pit, is informed by future monitoring and research rather than being contingent on independently verified demonstration that ecological effects are acceptable. As a result, permanent and non-offsettable ecological loss is managed after approval rather than controlled beforehand, and uncertainty is treated as a matter to be addressed over time rather than a reason for precautionary restraint.

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Appendix A

Example of EIANZ reassessment of significant ecological sites resulting in downgrading of overall values scores despite their importance for indigenous biodiversity. From Alliance Ecology Consulting Ltd. (2025). *Assessment of Ecological Effects: Terrestrial Ecology – Bendigo-Ophir Gold Project*. Table 12: *Ecological values assessment for habitat types within the ESA based on EIANZ guidelines*

	alter botanical composition and lead to local extirpation of species	
Mixed tussock shrubland and exotic grassland	**Representativeness: Low** This vegetation community is unlikely to have existed in any similar form pre-human and is heavily dominated by exotic species. **Rarity and distinctiveness: High** Thirty-three Nationally or Regionally At Risk or Threatened plant species. Provides variable-quality habitat for a diverse array of Threatened and At Risk fauna species **Diversity and pattern: Moderate** Mosaic of botanical assemblages as a result of environmental conditions (e.g., aspect, moisture availability, slope, shelter) and farming practices (e.g., stock accessibility, over-sowing and topdressing. This community contains elements of tussockland, shrubland, and herbfield resulting in a high native diversity (107 species) but is also dominated by exotic pasture (having only 26 % native coverage). **Ecological context: Moderate** This community, characterised by its heterogeneous structure, forms a buffer and connection between most other core communities of scrub or tussock. As conditions suit, this community has the capability to transform into other community types given its high diversity.	**Moderate** 'High' for one matter, 'moderate' for two matters, and low for one matter
Mixed scrubland	**Representativeness: Low** Mixed scrubland at the site has a total woody vegetation coverage of 39 % and of that 61 % is exotic and 39% is native. This vegetation community is not representative of grey shrubland in the ED elsewhere where coverage and native dominance can be higher. **Rarity and distinctiveness: High** Twenty-one Nationally or Regionally At Risk or Threatened plant species recorded including important populations of several At Risk – Declining species including *Olearia lineata*, scented tree daisy, *Coprosma virescens*, and desert broom. Provides variable-quality habitat for a diverse array of Threatened and At Risk fauna species. **Diversity and pattern: Moderate**	**Moderate** 'High' for one matter, 'moderate' for two matters, and low for one matter

Appendix B

Comparison of the landscape of the mine footprint from 1948 and 2023 showing extensive regeneration of native shrublands has occurred across the landscape.

Appendix C

Limits to offsetting under the NPS-IB

The National Policy Statement for Indigenous Biodiversity 2023 (amended 2025) expressly recognises that biodiversity offsetting is subject to limits, and that beyond those limits offsetting is not appropriate. These limits are set out in Appendix 3: Principles for Biodiversity Offsetting and reinforced by Appendix 4: Principles for Biodiversity Compensation.

Key limits to offsetting (Appendix 3, NPS-IB)

Appendix 3 provides that biodiversity offsetting is not appropriate where one or more of the following apply:

- **Irreplaceability and vulnerability**
  Offsetting is not appropriate where residual adverse effects cannot be offset because the indigenous biodiversity affected is irreplaceable or particularly vulnerable (e.g. rare ecosystems, highly restricted species, or nationally significant populations)
- **Lack of ecological equivalence (like-for-like failure)**
  Offsetting requires ecological equivalence in type, amount, and condition. Where like-for-like replacement cannot be achieved, offsetting is inappropriate
- **Uncertainty of outcome**
  Where ecological outcomes are uncertain, unknown, or highly risky, particularly for long-term or technically unproven restoration, offsetting is not appropriate
- **Scale and permanence of loss**
  Where losses are permanent or of such scale that no feasible offset can achieve no net loss or net gain within acceptable timeframes, offsetting is precluded.
- **Time lags**
  Significant time lags between loss and gain increases risk and may exceed acceptable limits, particularly for vulnerable ecosystems or species.
- **Failure of the mitigation hierarchy**
  Offsetting is only available after demonstrable avoidance, minimisation, and remediation have been exhausted. Where this has not occurred, offsetting should not be relied upon.

Relationship to biodiversity compensation (Appendix 4)

Appendix 4 recognises compensation as a separate and more limited response, applicable only in constrained circumstances. Importantly:

- Compensation does not remove or override the limits to offsetting;

- Compensation is not a substitute for offsetting where offsetting is required but infeasible; and
- Compensation does not legitimise impacts on significant or irreplaceable biodiversity.

Supporting guidance

The Department of Conservation's guidance on limits to biodiversity offsetting reinforces these principles, emphasising that there are upper limits to what can be offset and that where those limits are exceeded, accepting offsetting entails an unacceptable risk of net biodiversity loss.