

NOTICE OF REQUIREMENT FOR SPACE OPERATIONS NEW ZEALAND LIMITED FOR A DESIGNATION WITHIN A 2KM RADIUS (ELECTROMAGNETIC INTERFERENCE) AND A 3KM RADIUS (HORIZON MASK) OF THE SPACE OPERATIONS GROUND STATION DESIGNATION AT 721 AND 781 COLYER ROAD, INVERCARGILL, MIC/2025/20.	
To:	Hearing Commissioner
From:	Emma Spalding, Planning Consultant
Report Date:	31 August 2026
Scheduled Hearing Date:	28-30 September 2026

Notes:

1. This report sets out the advice of the reporting planner and Council advisors.
2. This report has yet to be considered by the Hearing Commissioner delegated by Invercargill City Council to make a recommendation to the Requiring Authority. Accordingly, the recommendation in this report is directed to the Hearing Commissioner and is not the Commissioner's recommendation on the Notice of Requirement.
3. A decision on the Notice of Requirement will be made by the Requiring Authority under Section 172(1) of the Resource Management Act 1991 after it has considered the Hearing Commissioner's recommendation to be issued under Section 171(2) of the Resource Management Act 1991, following the Hearing Commissioner having considered the Notice of Requirement and having heard from the Requiring Authority and submitters.

SUMMARY:

Requiring authority:	Space Operations New Zealand Ltd
Notice of Requirement:	To designate airspace and land in relation to electromagnetic interference and built form, to prevent interference with the existing Space Operations satellite ground station.
Site address:	Airspace and Land within a 2km and 3km radius of 721 and 781 Colyer Road, Invercargill
Legal description:	Various
Lodgement date:	31 July 2025
Section 92:	Date requested: 12 August 2025
	Date received: 25 March 2026
Notification date:	18 April 2026
Submissions closing date:	18 May 2026
Submissions received:	9 (including one late submission)
Report prepared by:	Emma Spalding, Planning Consultant on behalf of Invercargill City Council
Signed:	
Date:	31 August 2026

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Abbreviations

Electromagnetic interference	EMI
Invercargill City Council District Plan	ICC District Plan
National Policy Statement for Electricity Networks	NPS-EN
National Policy Statement for Infrastructure	NPS-I
Notice of Requirement	NoR
Radio Spectrum Management	RSM
Resource Management Act 1991	RMA
Southland Regional Policy Statement	SRPS
Space Operations New Zealand Ltd	SpaceOps

1 Introduction

1.1 Report Author

1. My full name is Emma Jane Spalding. I am a Partner with the firm Taylor Planning. I have a Masters Degree in Regional and Resource Planning (awarded with Distinction) and a Bachelor of Arts majoring in Geography, both from Otago University. I am a full member of the New Zealand Planning Institute.
2. I have 17 years' planning experience, which includes planning consultancy, regional and local government positions. My experience includes preparing and processing designations and resource consent applications, including preparing and presenting s42A reports for hearings, and presenting expert planning evidence at the Environment Court. I am also experienced in policy analysis and plan development, including undertaking designation rollover projects for District Plan Reviews, the preparation of plan provisions and accompanying s32 evaluation reports, preparing and presenting s42A reports; analysing proposed plans/policy statements and preparing advice and submissions for clients on RMA documents.

1.2 Code of Conduct for Expert Witnesses

3. Although this is a Council hearing, I confirm that I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note and that I have complied with it when preparing this report. I have also read and am familiar with the Resource Management Law Association / New Zealand Planning Institute "Role of Expert Planning Witnesses" paper. I confirm that I have considered all the material facts that I am aware of that might alter or detract from the opinions that I express, and that this evidence is within my area of expertise, except where I state that I am relying on the evidence or opinions of another person. Having reviewed the submissions relevant to this application I advise there are no conflicts of interest that would impede me from providing independent advice to the Hearings Panel.

2 Description of Activity, Site and Locality

2.1 Background and Context

4. Pursuant to Section 167 of the RMA, Space Operations New Zealand Limited (SpaceOps) is a Requiring Authority. The Requiring Authority status was confirmed by way of the New Zealand Gazette on 13 March 2025.
5. SpaceOps has established an existing satellite ground station, located at 721 and 781 Colyer Road, Invercargill, known as the Awarua Satellite Ground Station. The ground station was established in 2006 and has a detailed consenting history, as outlined below.
6. Most recently, SpaceOps lodged a separate Notice of Requirement (NoR) for the creation of a new designation for the existing ground station. This NoR was recommended for approval on 13 July 2026, and confirmed by SpaceOps on 25 July 2026. The NoR includes the construction, upgrade, maintenance and operation of the ground station to the extent that the station undertakes radiocommunication activities as defined in section 2(1) of the Radiocommunications Act 1989. This includes structures, works, and activities ancillary to the transmission or reception of signs, signals, writing, images, sounds or intelligence of any nature by radio waves. This designation has been included in the Invercargill City Council District Plan (ICC District Plan) as Designation 97.

2.1.1 Ground Station Resource Consent History

7. The ground station was previously authorised by several resource consents which provided for the existing ground station and the future expansion of the ground station, as outlined below:

- *LUC/2006/282:*
In 2006 resource consent was granted on a non-notified basis, to establish and operate a European Space Agency Ariane Rocket Tracking Station including up to four dish antennas of up to 11 metres in diameter and 15 metres in height, and two Portacom buildings measuring 66.56m² and 17.92m² respectively.
- *RMA/2018/44:*
In 2018, a subdivision application was granted to create a new Lot (2.7ha) from the farmland at 26 Awarua Siding Road and amalgamate it with the satellite ground station site at 781 Colyer Road.
- *RMA/2019/92:*
In 2019 a further consent to expand the existing satellite ground station was granted on a non-notified basis. This consent included retrospective consent for a 3.4m dish antenna, and the establishment of an additional 20 dish antennas, 15 of which may be protected by radomes (large, white geometric dome enclosures), 14 Yagi Antennas, 3 buildings and a container shed.
- *RMA/2023/7:*
Subdivision consent was granted in 2023 to create a separate title for Lot 2 DP 524692 by cancellation of the amalgamation condition under RMA/2018/44 that required Lot 2 524692 to be held with Sections 22-27 and 35-38 Block III Campbelltown Hundred.
- *RMA/2023/8:*
Land use consent was also granted in 2023 to expand the existing satellite ground station from 781 Colyer Road onto Lot 2 DP 524692, which provided for a total of 148 antennas and 15 buildings across the site as outlined in the table below. A lapse period of 15 years was granted for this consent.
- *CRT/2023/3:*
An associated certificate of compliance for the clearance of indigenous biodiversity was also approved (CRT/2023/3), confirming that clearance of less than 1000m² of indigenous vegetation over a 5 year period for the future establishment of tracks and installation of antennas and associated equipment would be a permitted activity.
- *RMA/2026/30:*
Consent for a further expansion of the ground station was lodged by Globalstar, who have an existing KSAT ground station within the SpaceOps complex. This consent provides for an additional four antennas on the site and a new control building to support the expanded antennas array, which were not provided for under the expansion consent RMA/2023/8. The consent also re-authorises the remaining expansion of the ground station covered by RMA/2023/8. This consent was granted on 4 June 2026. This consent will replace RMA/2023/8, which will be surrendered.

2.1.2 Industrial 4 (Awarua) Zone

8. An area of Industrial Zoned land is located to the north-west of the SpaceOps ground station site. As a brief background, in 2008, Plan Change 8 sought a zoning change for the area of land now zoned as Industrial 4 (Awarua) Zone. This land was previously part of the Rural Sub-Area under the Invercargill City District Plan (2005), and was purchased by Invercargill City

Council, who sought to re-zone it to Industrial Sub-Area A, in order to facilitate its use for industrial development.

9. The s32 Report for Plan Change 8 recognised that space research and communications were occurring both on the proposed industrial land, and on the adjoining site (now the SpaceOps site), and considered that these activities would not affect the development and use of land for industrial purposes. No issues were identified with the proposed Industrial Zone creating interference for the SpaceOps site, however at that time only one antenna had been consented, which had not yet been constructed.
10. Plan Change 8 was approved and became operative following an appeal to the Environment Court, in 2009. When the ICC District Plan was reviewed in 2019, the Industrial Sub-Area A was renamed Industrial 4 (Awarua) Zone. The zone remains vacant of industrial development. The site was purchased by Stewart Family Assets in 2022. A consent application for a windfarm containing seven turbines has been lodged (RMA/2026/26), and is currently on hold for further information. The proposed turbines have a total maximum height of 200m.

2.2 Site and Surrounding Environment Description

11. The land subject to the designation is all land and airspace within a 2km radius, and airspace above a 'horizon mask' within a 3km radius of the ground station designation (Designation 97 in the ICC District Plan) located at 721 and 781 Colyer Road, Invercargill. The ground station site is legally described as Lot 1 DP 483454 and Lot 1 Deposited Plan 524692 held in Record of Title 837915, and Lot 2 DP 524692 held in Record of Title 7885111. The designation does not apply to the coastal marine area and or the Conservation land located to the south of the ground station site.



Figure 1: Area subject to the proposed designation (Source: Application material)

12. The area subject to the proposed designation is within the Rural Zone and the Industrial 4 (Awarua) Zone. As noted above, the Industrial-zoned land is currently vacant, but is subject to a resource consent application for a windfarm.
13. Land uses within the 3km radius include residential, rural and forestry activities. There are also existing designations within the 3km radius, for rail purposes (KiwiRail) and State Highway (NZTA).
14. Further to the north, beyond the 3km radius boundary, are several large-scale industrial activities, and the Colyer Road substation.
15. The south-west portion of the Awarua ground station site is subject to a Regionally Significant Wetlands and Sensitive Waterbodies overlay in the Environment Southland Water and Land Plan (Name: Awarua Plain - Southland Estuaries: Wetlands adjoining Bluff Harbour). This

regionally significant wetland extends to the south onto Crown land administered by the Department of Conservation. This land to the south is identified as being subject to the following overlays within the ICC District Plan:

- The Coastal Environment,
- Natural Features and Landscapes, and
- An area of significant indigenous biodiversity (Awarua Plains Seaward Moss).

2.3 Proposal Description

16. Pursuant to Section 168 of the Resource Management Act 1991 (RMA), Space Operations New Zealand Limited (SpaceOps), as the requiring authority, has lodged a NoR for a proposed restrictive designation in the ICC District Plan.
17. As outlined above, SpaceOps has an existing satellite ground station, located at 721 and 781 Colyer Road, Invercargill, known as the Awarua satellite ground station. It is proposed to establish a restrictive designation surrounding the existing ground station to prevent any interference on the satellite ground station from surrounding land-uses.
18. The designation involves two key components:
 - A 'horizon mask' of 5 degrees as measured from 2 metres above the boundary of the ground station designation site extending out 3km in all directions (excluding the coastal marine area and all public conservation land). This component establishes a height limit for all built form within 3km of the Awarua ground station site and will mean that no building, structure, or vegetation can protrude through the horizon mask when within 3km from the boundary of the ground station designation (Designation 97).
 - An Electromagnetic Interference (EMI) restriction that will extend 2km in all directions (excluding the coastal marine area and all public conservation land) from the boundary of the Awarua ground station designation. This component will limit emissions greater than -154 dBW/MHz at frequencies used for the reception of radio signals from spacecraft at Awarua satellite ground station set out in Table of Radio Spectrum Usage in New Zealand (PIB 21) dated 11 June 2021 and any subsequent amendments and/or updates to this document. These frequencies can be found at: <https://www.rsm.govt.nz/assets/Uploads/documents/pibs/table-of-radio-spectrum-usage-in-new-zealand-pib-21.pdf>.
19. SpaceOps advise that they require the designation in order to protect the efficient operation and functioning of the satellite ground station.
20. The application states that the objectives of SpaceOps for the designation are to ensure that the satellite ground station can continue to operate in an efficient manner by sending and receiving radiocommunications as defined in the Radiocommunications Act 1989, unimpeded by conflicting activities.

2.3.1 Request for Further Information

21. A section 92 request for further information was sent to SpaceOps on 12 August 2025. Their final response was received on 25 March 2026.
22. The section 92 request asked for further information in relation to various matters including the following:
 - An explanation of how the restrictive designation would operate in practice;
 - A report by a suitably qualified expert to explain what the EMI restriction will mean for landowners or infrastructure operators in lay terms;
 - A copy of the Radio Spectrum Management (RSM) Decision and Radio Regulations referenced in the application;
 - A legal opinion on scope to manage EMI under the RMA; and

- Details of any consultation undertaken, including with other requiring authorities where the proposed NoR would overlap with existing designations.

23. In response to the section 92 request, SpaceOps provided the requested further information. This information forms part of the proposal.

2.3.2 Notification and Engineering Review

24. Following the provision of the further information, SpaceOps requested that the NoR be publicly notified. The NoR was publicly notified on 18 April 2026. The closing date for submissions was 18 May 2026. Nine submissions were received, including one late submission, which will be outlined below.
25. Following the close of submissions, Council engaged a radiocommunications engineer to review the application and submissions, and provide advice. The engineering review was undertaken by Mr A Sathyendran, of AnS Consulting, who provided a report dated June 2026. The report identified several issues with the application, particularly in relation to the proposed EMI restrictions. The applicant subsequently provided a response to the engineering review (dated 7 August 2026) and provided amended conditions to address the concerns raised by the engineering review. Mr Sathyendran provided an additional memo dated 27 August 2026, with his final comments and recommendations.

2.3.3 Proposed Conditions

26. The following conditions are proposed by the applicant in relation to the designation. These conditions were updated by the applicant on 7 August 2026 in their memo titled 'Response to Council Engineering Review':

1. *The Airspace and Electromagnetic Interference Limitation Surface covers the following land and airspace:*
 - a. *All land and airspace within a 2km radius as measured from any point of the boundary of the land designation (Lot 1 DP 483454, Lot 1 DP 524692, and Lot 2 DP 524692 but excluding the Regionally Significant Wetland as the wetland is not part of the land designation) as it relates to Electromagnetic Interference from terrestrial services; and*
 - b. *All airspace within a 3km radius from the horizon mask as measured at an angle of 5 degrees at a height of 2 metres commencing [at] land designation (Lot 1 DP 483454, Lot 1 DP 524692, and Lot 2 DP 524692 but excluding the Regionally Significant Wetland as the wetland is not part of the land designation boundary).*

All land within the coastal marine area, and public conservation land, is not included within the designation. The extent of the designation is shown on the plan entitled "Space Operations New Zealand Designation – Restrictive Air Designation Map", reference 72350 and dated 19/03/2026.

2. *New objects or extensions of objects that penetrate the Airspace and Electromagnetic Interference Limitation Surface shall be prohibited except where:*
 - a. *The party on whose land the object is located or who is otherwise responsible for the object has received written approval from Space Operations New Zealand Limited for the penetration.*
3.
 - a. *Within the Electromagnetic Interference Limitation Area shown on the Designation Plan, no terrestrial service shall produce electromagnetic*

emissions greater than -154 dBW/MHz at frequencies used for the reception of radio signals from spacecraft at the Awarua Satellite Ground Station, as identified in the Table of Radio Spectrum Usage in New Zealand (PIB 21), Issue 11 (June 2021), published by the Ministry of Business, Innovation and Employment, or any subsequent replacement or amendment.

- b. For the purposes of this condition, a terrestrial service means a radiocommunication service operating between points on or near the Earth's surface that intentionally transmits or receives radiofrequency signals. This includes, but is not limited to, licensed radio communication systems, point-to-point microwave links, fixed wireless services, radio telemetry, SCADA radio communications, broadcasting services and other terrestrial radiocommunication services.*
- c. For the avoidance of doubt, this condition does not apply to buildings, structures, electrical infrastructure or electrical equipment that do not constitute, or include as a component, a terrestrial service, including (without limitation) wind turbines, solar panels, generators, transformers, substations, inverters, switchgear, battery storage systems or other electrical equipment that generate only incidental electromagnetic emissions as a by-product of their operation.*

27. The extent of the *Airspace and Electromagnetic Interference Limitation Surface* restrictive designation is shown in Figure 1 above.

2.4 Lapse Date

28. Section 184 of the RMA provides for a designation to lapse five years after it is included in the District Plan unless:

- (a) It has been given effect to; or
- (b) Within three months of the designation lapsing, the territorial authority determines that substantial progress or effort has been and continues to be made towards giving effect to the designation, or
- (c) The designation specifies a different lapse period.

29. As discussed in the sections above, the purpose of the NoR is to protect the ongoing operation of the satellite ground station and no physical works are necessary to give effect to the designation. No lapse date is therefore proposed.

2.5 Statutory Approvals

2.5.1 Land subject to other designations

30. Some land to be designated for the restrictive purposes is subject to existing designations by other requiring authorities (such as the State Highway and Railway Network designations).
31. The applicant has undertaken consultation with NZTA and KiwiRail, and provided approval from these requiring authorities, confirming that the NZTA and KiwiRail designations will be the 'primary' designation, and the SpaceOps restrictive designation will be the secondary designation.

3 Notification and Submissions

3.1 Notification and submissions

32. The NoR was publicly notified on 18 April 2026. The closing date for submissions was 18 May 2026. Nine submissions were received, including one late submission, as set out in the Table below.

Submission Number	Name	Support/Oppose/Neutral
1	George Rankin	Neutral
2	Marc and Amy Jarvis	Oppose
3	Adam Fuller	Oppose
4	South Port Attention: Shannon Jennings	Oppose
5	Herman Thys	Oppose
6	Stewart Family Assets C/- Lane Neave Lawyers Attention: Joshua Leckie and Hayley Mahon	Oppose
7	Southland Business Chamber Attention: Sheree Carey CEO	Neutral
8	Environment Southland Attention Shana Lee, Team Leader Policy	Neutral
9 (Late submission)	Invercargill City Council, Water Services Group Attention Alistair Snow	Neutral

Table 1: Submissions

3.1.1 Late Submissions

33. The Hearing Commissioner must decide whether accept the late submission. Under section 37A of the RMA, the Hearing Commissioner must take into account:
- the interests of any persons who, in the Hearing Commissioners opinion, may be directly affected by the extension or waiver; and
 - the interests of the community in achieving adequate assessment of the effects of the proposal; and
 - the duty under section 21 of the RMA to avoid unreasonable delay.
34. The late submission from ICC Water Services Group was received on 20 May 2026, two days after the closing date. Under section 37 and section 37A of the RMA, I recommend that the late submission be accepted. The reasons for my recommendation are:
- (a) the submission is within scope;
 - (b) the matters raised in the submission do not disadvantage other directly affected parties;
 - (c) I do not consider that the waiver would directly affect the interests of any person; and

- (d) it is considered that including the late submission will not cause any unreasonable delay.

3.2 Outline of submissions

35. I have read all the submissions lodged on the NoR including the reasons for the submissions and the relief sought.
36. A total of 9 submissions (including the one late submission) were received. As set out above, 5 submissions were in opposition, and 4 were neutral. A summary of the submissions received is provided in Appendix 1 to this report.
37. The submissions identify a number of recurring themes relevant to the assessment of the NoR.
38. The first key theme is the potential for the proposed horizon mask and EMI limitation area to restrict future land use and development. Submitters identify possible constraints on industrial buildings and structures, port and logistics activities, renewable energy generation, electricity distribution infrastructure, water supply infrastructure, and farming technologies. Several submitters consider that these constraints would be inconsistent with the anticipated use of land within the Industrial 4 Zone and the Rural Zone.
39. Submitters also raise concerns regarding effects on private property rights, land value, and investment certainty. In particular, some submitters consider that the proposed designation could render affected land incapable of reasonable use, or materially affect planned or potential development opportunities. Relief sought in response to these concerns includes withdrawal or decline of the NoR, reduction in the spatial extent or effect of the controls, acquisition of affected land, or compensation where restrictions result in loss of development opportunity or land value.
40. Another issue raised in submissions is the adequacy and transparency of the proposed approval mechanism for activities that may breach the limitation surfaces or generate EMI. Submitters seek greater certainty as to how future proposals would be assessed, including the use of objective criteria, technical assessment, and independent review where appropriate. Some submitters consider that reliance on written approval from SpaceOps could operate as a private approval mechanism over third-party development.
41. Several submitters question whether the NoR has been sufficiently justified, including whether the extent of the designation is the minimum necessary to protect the operation of the satellite ground station, and whether alternatives and effects on surrounding land uses have been adequately assessed. Procedural matters are also raised, including the relationship between this NoR, other consenting processes, and SpaceOps' requiring authority status.
42. This report does not address each individual submission, although some submissions may be referred to specifically. Rather, submissions have been assessed with reference to the issues identified and the relief sought.
43. The issues raised in submissions have been considered in the assessment of the NoR, including by the radiocommunications engineer where they relate to the engineer's professional discipline. The engineering review has informed my consideration of the submissions.

4 Consideration of the Notices of Requirement

4.1 Designations Under the Resource Management Act 1991

44. The RMA provides that the procedures adopted in processing a NoR are generally those adopted for processing a resource consent application. This includes lodgement (or in the case of NoRs being 'served on a Council'), requiring further information, notification, receiving and hearing of submissions.

45. However, the procedure differs from the resource consent process in respect of the Council's consideration of a NoR. Section 171(1) of the RMA states:
- (1A) When considering a requirement and any submissions received, a territorial authority must not have regard to trade competition or the effects of trade competition.*
- (1) When considering a requirement and any submissions received, a territorial authority must, subject to Part 2, consider the effects on the environment of allowing the requirement, having particular regard to—*
- (a) any relevant provisions of—*
- (i) a national policy statement:*
- (ii) a New Zealand coastal policy statement:*
- (iii) a regional policy statement or proposed regional policy statement:*
- (iiia) an infrastructure design solution:*
- (iv) a plan or proposed plan; and*
- (b) if the requiring authority does not have an interest in the land sufficient for undertaking the work,—*
- (i) whether adequate consideration has been given to any alternative sites, routes, or methods of undertaking the work; and*
- (ii) whether the work and designation are reasonably necessary for achieving the objectives of the requiring authority for which the designation is sought; and*
- (c) [Repealed]*
- (d) any other matter the territorial authority considers reasonably necessary in order to make a recommendation on the requirement.*
- (1B) The effects to be considered under subsection (1) may include any positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from the activity enabled by the designation, as long as those effects result from measures proposed or agreed to by the requiring authority.*
46. Section 171(1) is subject to Part 2 of the RMA. Part 2 contains the purpose and principles of the RMA. It has been confirmed by the Environment Court that, in relation to a designation matter:
- ...all considerations, whether favouring or negating the designation, are secondary to the requirement that the provisions of Part II of the RMA must be fulfilled by the proposal.¹*
47. After considering these matters, the council needs to make a recommendation to the requiring authority under section 171(2) of the RMA, which states:
- (2) The territorial authority may recommend to the requiring authority that it –*
- (a) confirm the requirement:*
- (b) modify the requirement:*
- (c) impose conditions:*
- (d) withdraw the requirement.*
48. Reasons must be given for the recommendation under section 171(3) of the RMA.

¹ 2 See Estate of P.A Moran and Others v Transit NZ(W55/99).

5 Assessment of Effects on Environment

49. The assessment of effects in this report considers the effects on the environment of allowing the NoR, having particular regard to the matters set out in sections 171(1)(a) to (d) and (1B) of the RMA.

5.1 Trade Competition

50. The submissions do not raise any trade competition issues. It is considered that there are no trade competition effects that should be disregarded.

5.2 Permitted Baseline Assessment

51. Pursuant to Section 104(2) of RMA 1991, the Council may disregard an adverse effect of the activity on the environment if a national environmental standard or the District Plan permits an activity with that effect. Council may also disregard the effects of lawfully established activities on the site, and activities which could be carried out under granted, but as yet unexercised resource consents.
52. Application of the permitted baseline approach is optional depending on its merits in the circumstances of the NoR being considered. In this case, due to the restrictive nature of the proposed designation, it is considered that the permitted baseline will not offer any assistance in the context of this proposal.

5.3 Receiving Environment

53. The existing and reasonably foreseeable receiving environment is made up of the existing environment and associated effects from lawfully established activities; effects from any resource consents granted and likely to be implemented; and the environment as likely to be modified by activities permitted in the district plan.
54. As outlined above, the existing environment includes the existing satellite ground station, as well as the expansion of the ground station as authorised by previous consents and the recently confirmed designation for this site.
55. The wider receiving environment consists of predominantly rural activities, industrial activities and conservation activities. To the north-west (at 99 Awarua Siding Road) is land zoned Industrial 4 (Awarua) Zone, and because it is currently undeveloped, it is rural in character. As noted this site has a live consent application for a windfarm, however this has not been granted and has not been considered as part of the receiving environment.
56. The following activities are permitted in the Industrial 4 Zone, where they comply with the Concept Plan contained in Appendix 5 of the ICC District Plan, although any building or structure requires consent as a controlled activity:
- Agriculture
 - Essential Services
 - Freight Depot
 - Heavy Industry
 - Land Transport Facility
 - Light Industry
 - Specialist Facilities for Animal Husbandry including Veterinary Clinic
 - Storage and sale of liquid and gaseous fuels.
57. It is also noted that any activity associated with the investigation, development and operation of renewable energy generation in the Industrial 4 Zone is a permitted activity, under rule ENE-R3.
58. It is against this receiving environment that the effects of the designation, beyond the permitted baseline, must be measured.

5.4 Written Approvals

59. Any effect on a person who has given written approval to the NoR may be disregarded if it is appropriate to do so.
60. No affected party approvals were included with the NoR as lodged. During the course of processing, the applicant undertook consultation with Te Ao Mārama, and obtained their unconditional written approval, in a letter dated 18 March 2025. As such, the consent authority must not have regard to any potential effects on rūnanga.
61. It is also noted that KiwiRail and NZTA / Waka Kotahi have provided written consent under s176(1)(b) of the RMA, as a requiring authority with an existing designation over land subject to the proposed designation. The proposed NoR is located over KiwiRail Designation 55 (Railway purposes) and NZTA Designation 48 (State Highway 1) in the ICC District Plan. It is noted that s176(1)(b) consent does not constitute affected parties approval in relation to Section 95E.

5.5 Positive Effects

62. The application identifies a number of positive effects associated with the proposed restrictive designation. These include:
- Enabling the continued operation of the Awarua satellite ground station by protecting it from physical obstructions and harmful EMI;
 - Providing greater certainty for the continued operation of the ground station;
 - Supporting the ongoing delivery of satellite communication services to domestic and international customers;
 - Providing clarity to surrounding landowners regarding constraints associated with protecting the operation of the ground station, by providing clear height restrictions and EMI restrictions; and
 - Supporting investment in nationally significant space and telecommunications infrastructure.
63. The application notes that the satellite ground station has the potential to further enhance Southland's economy as it will lead to the exposure of Southland as being somewhere where space related activities can feasibly take place without possible interference from objects and EMI from neighbouring properties which could restrict transmissions. The application states that these are all considered to be positive for the social and economic wellbeing of not only Invercargill city, but the wider Southland region.
64. I accept that there are likely positive effects associated with providing a higher level of protection for the operation of the satellite ground station. The proposed designation would provide a greater level of certainty regarding future land use and development around the facility, reducing the risk that incompatible activities could compromise its operation.
65. The application also refers to wider economic and strategic benefits arising from the continued operation of the ground station, including benefits to the Southland region and New Zealand's growing space sector. While I acknowledge that such benefits may occur, limited information has been provided about the benefits to Invercargill, to quantify the extent of any economic benefits, or demonstrate how they would be enhanced by the proposed designation beyond the protections already available under existing regulatory frameworks.
66. These positive effects should also be considered against the potential negative impact on the adjacent Industrial Zone and the economic effects that would result from restricting development in this zone. Submissions raise concerns that the designation could impact on the investment certainty for the Industrial Zone, which may deter investment in the Awarua Industrial area, with resulting adverse effects on economic growth. Effects relating to the Industrial Zone are discussed further below.
67. Overall, I consider the proposal may result in positive effects through the protection of nationally significant infrastructure by providing increased certainty for the ongoing operation

of the satellite ground station. However, the weight that can be attributed to these positive effects is moderated by the fact that some protections already exist under the Radiocommunications Act framework, and because the wider economic and strategic benefits have not been specifically quantified. These positive effects must therefore be considered alongside the potential adverse effects of the designation on surrounding landowners and future development opportunities.

5.6 Actual and Potential Adverse Effects

5.6.1 Electromagnetic Interference

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68. The NoR application assesses the actual and potential adverse effects of the proposed EMI restriction as less than minor, with the primary effect being restrictions on certain radio-emitting activities within the 2 km protection area. The NoR states that the designation would prohibit activities within 2km of the Awarua satellite ground station that generate electromagnetic emissions greater than -154 dBW/MHz, at frequencies used for receiving signals from spacecraft. The NoR acknowledges that this could potentially constrain certain terrestrial radio transmitters and industrial equipment that operate within the protected frequency bands. The application specifically identified potential restrictions on radio frequency emissions from:

- Switched-mode power supplies
- Motor controllers
- Inverters
- Other industrial devices

69. The NoR states that where such equipment generates emissions above the specified threshold, mitigation or redesign of development may be required. The NoR assesses the effects on adjacent industrial land, surrounding rural land, and common domestic devices.

70. The NoR acknowledges uncertainty as to whether future industrial activities in the Industrial 4 Zone may have a functional need for equipment capable of generating emissions above the proposed protected threshold. However, it concludes that any effects associated with these restrictions are likely to be less than minor, largely because the protection already exists through Radio Spectrum Management (RSM) controls.

71. In relation to surrounding rural land, the NoR concludes that the proposed EMI restriction will not adversely affect existing rural activities because there is generally no functional requirement for high-powered radio transmitters on surrounding agricultural land. Effects on neighbouring rural properties are therefore assessed as less than minor.

72. In terms of common domestic devices, the NoR states that ordinary domestic technology such as cell phones, personal locator beacons, and domestic-scale satellite dishes used for internet services do not operate on the protected frequencies and therefore would not be prohibited or affected by the designation.

73. The application relies heavily on the fact that the Awarua ground station is already protected by a RSM protection zone established in 2020, by the Radio Spectrum Management November 2020 decision, which manages EMI in three specified protection zones (Awarua Earth Station being one of the three). The decision is included in the application documentation, and states the following:

“RSM has decided to define three protection zones (Warkworth Earth Station, Awarua Earth Station and Mahia Peninsula) allocated for SR, EES and SO with parameters as follows.

- 1) Each protection zone is centred on a point location, as shown in Table 1 below*
- 2) Each protection zone has a radius of 2 km from that point location*
- 3) The protection frequency range is 2200–2290 MHz*
- 4) To avoid desensitisation of the satellite station receivers, permissible interference from terrestrial services within the protection area shall be less than -154 dBW/MHz.*

74. The EMI restriction within the proposed designation largely seeks to incorporate the existing RSM protections above into the ICC District Plan, rather than creating an entirely new restriction for EMI. The applicant explains that the benefit of a designation is that it will provide greater certainty to SpaceOps and surrounding landowners, and the designation will be identified in LIM reports, increasing the awareness of the restrictions for landowners, who may not otherwise be aware of the RSM Decision.

Submissions

75. As noted above, submitters raise concerns that the EMI restriction may constrain existing and future use of land within the 2km area, particularly where industrial, infrastructure, rural production, telemetry, communications, port-related, renewable energy, or water services activities may be undertaken:
- The submission in opposition from Herman Thys notes that their farming operation is becoming more and more high tech, and is concerned that the restrictions might prevent them from being able to adapt to new technology or to generate their own energy supply. Their farm uses virtual fencing, and has future plans to implement solar and/or wind energy generation.
 - The Stewart Family Assets submission notes that the EMI limitation area would restrict the use and development of many elements of industrial businesses such as:
 - a) heavy electrical machinery with large currents, switching or motors;
 - b) high voltage transformers, substations, welding equipment and battery charging systems;
 - c) manufacturing and processing plants with induction heating lines; and
 - d) generators, energy generation facilities including solar panels, power transformers and inverters.
 - ICC Water Services Group considers the proposed designation may place restrictions on a water supply investigation activity that council is undertaking in the Awarua area. The investigation involves installation of wells, investigations and on-going production pumping which will require power supply via a new 11 KV network, motor controllers and inverters to pump and treat the water and may generate radio frequency emissions by switch-mode power supplies, motor controllers, inverters and other industrial devices. The ICC Water Services Group submission notes that variable speed drives produce electromagnetic noise generally in the range of 2 - 20kHz, and cable emissions < 100MHz. The submission notes that although it is unlikely to affect the radio signals as explained within the NoR, Council reserves its right to not be restricted, as the scope of the water supply development is yet to be determined.
76. Submitters also seek greater certainty as to how compliance with the proposed EMI threshold would be determined, who would undertake technical assessment, and how SpaceOps' written approval process would operate in practice.

Council's Specialist Engineering Review

77. An engineering review of the application and submissions was undertaken on behalf of ICC, by Mr A Sathyendran of AnS Consulting. The engineering review focused on the EMI restriction proposed by the NoR. The engineering review identified several issues with the NoR application, which are summarised in the executive summary of the engineering review and copied below:
1. *Invercargill City Council, through Taylor Planning, asked me to review the Space Operations New Zealand Limited (Space Ops) application for a designation to protect the Awarua Satellite Ground Station, together with the submissions made on it. This summary sets out my main conclusions; the reasoning and supporting analysis are in the body of the report.*

2. *The application relies on two sources of protection: the Radio Spectrum Management (RSM) November 2020 decision (which in turn relies on the Radio Communications Act 1989 and Radio Regulations 2001) and the ITU-R Radio Regulations. That reliance is, in itself, correct. However, the application interprets those documents as giving Space Ops a far broader protection than they in fact provide, and it offers no analysis to justify the protection it claims.*
 3. *The -154 dBW/MHz limit is real, but it is narrower than the application assumes. It protects the ground station only from terrestrial radio services, and only from those that came into operation after the November 2020 decision. It does not, on its own terms, protect against every activity that produces an electromagnetic emission, and it cannot be applied retrospectively to services that were already operating.*
 4. *There is already background interference at the site, mainly from cellular base stations operating below and above the protected band, all of which predate the November 2020 decision. The Act protects against individual interferers, not against the cumulative effect of many. This means that emissions which are individually harmless could together push the total interference past -154 dBW/MHz, and the Act would provide no protection in that situation.*
 5. *The 2 km protection area is justified, because it is what the November 2020 decision specifies. The 3 km horizon mask is different: it concerns physical structures rather than radio emissions. Neither the Radiocommunications Act 1989 and Regulations 2001 nor the RSM November 2020 decision deals with physical obstruction, and the application does not explain how the horizon mask envelope was derived. Its basis therefore needs to be explained before it can be assessed.*
 6. *The concerns raised in submissions, such as those about virtual fencing, wind and solar generation, inverters and electrical distribution networks, are valid concerns to raise. But it cannot simply be assumed that these devices will cause harmful interference; that would need to be established by analysis, and no such analysis has been provided by the applicant or in the submissions.*
 7. *It is also important to note that meeting the EMC standards does not answer this question. Those standards are generic: compliance establishes only that a device may lawfully be supplied, leaving open whether it will contribute interference at this particular, highly sensitive receiver. Whether any of these devices causes harmful interference therefore remains a matter for evidence, on which I am not presently able to reach a concluded view.*
 8. *The application does not appear to consider any way of managing interference other than preventing emissions within the 2 km area. Given the background interference the site already faces, and the Act's limited protection against cumulative effects, Space Ops would be better served by also considering mitigation at its own site.*
 9. *In short, Space Ops is entitled to the protection that the -154 dBW/MHz limit and the general interference provisions of the Act and the regulation actually provide. It has not, however, shown that the much broader protection sought in the application is within its rights. There are significant gaps in the information provided, and until those gaps are addressed I am not able to recommend conditions or to confirm that the protections claimed are justified.*
78. The engineering review found that the NoR application was overly reliant on the existing protections afforded by the RSM decision (which relies on the Radiocommunication Act 1989 and the Radiocommunications Regulations 2001) and the ITU-R Radio Regulations, and has misinterpreted the protections available to it. The engineering review explained that the NoR application goes beyond the scope of the existing protections and the protection sought by the NoR is significantly greater than the protection actually available through the existing

framework. The RSM decision and Radio Regulations do not protect against every source of electromagnetic emission, they only protect against terrestrial radiocommunication services, and only those that came into operation after November 2020. There is no existing protection for incidental EMI created by electrical equipment, background interference, and no protection against cumulative interference.

79. The applicant subsequently provided a response to the engineering review and made amendments to the proposed conditions associated with the designation. Proposed Condition 3 has been amended to clarify the extent of the EMI restriction being sought, and to include an explanation of what is considered to be a 'terrestrial service'. An additional condition clause was also added to highlight what activities are exempt from the condition restricting EMI:

For the avoidance of doubt, this condition does not apply to buildings, structures, electrical infrastructure or electrical equipment that do not constitute, or include as a component, a terrestrial service, including (without limitation) wind turbines, solar panels, generators, transformers, substations, inverters, switchgear, battery storage systems or other electrical equipment that generate only incidental electromagnetic emissions as a by-product of their operation.

80. The applicant's response also noted that the designation is primarily intended to manage new activities and changes to existing activities following confirmation of the designation, and is not intended to retrospectively prohibit lawfully established activities solely because they predate the RSM decision or the designation. The applicant's response also confirmed that the purpose of the designation is to restrict individual new activities, and would not apply cumulatively.
81. This response has been reviewed by Council's reviewer Mr Sathyendran who recommended several amendments to the conditions proposed by the applicant, in order to clarify extent of the protection provided by the designation and align it more closely with the existing protections provided by the RSM decision and Radio Regulations. Mr Sathyendran's final comments are provided in a memo dated 27 August 2026 (contained in Appendix 2).

Assessment

82. Based on the amendments to the application and designation conditions, and the expert advice and further recommended amendments provided by Mr Sathyendran, I consider that the proposed EMI restrictions imposed by the designation now closely align with the RSM protections, and would not place further restrictions on surrounding landowners beyond what already exist. The proposal will ensure landowners and plan users are aware of the RSM protections by inserting them into the ICC District Plan as a designation.
83. In terms of the activities identified by submitters, the amendments to Condition 3 now clarify that electrical equipment (such as wind turbines, solar panels, generators, transformers, substations, inverters, switchgear, battery storage systems that generate only incidental electromagnetic emissions as a by-product of their operation) would not be restricted by the EMI aspect of the designation. It is only those activities that constitute a 'terrestrial service' or include a terrestrial service' as a component of their operation which would be restricted.
84. As explained in the applicant's response, electrical equipment associated with solar panels such as inverters, switched-mode power supplies, induction motors and pulse width modulated control systems are not terrestrial services and are not captured by Condition 3 merely because they may generate incidental electromagnetic emissions. However, the applicant does note that utility scale solar installations may incorporate ancillary terrestrial services, such as licensed microwave links, radio telemetry or SCADA communications used for monitoring and operational control. It is those ancillary terrestrial services, rather than the solar installation or its electrical infrastructure itself, that may fall within the scope of Condition 3.
85. Similarly, the applicant explained that electrical distribution networks, infrastructure, substations and associated electrical equipment are not intended to be regulated by the designation, as these are not terrestrial services. However, electrical network infrastructure may incorporate ancillary terrestrial services, including licensed radio communications, microwave links and SCADA radio systems used for network monitoring and control. It is those

terrestrial radiocommunication services, rather than the electrical infrastructure itself, that may be subject to Condition 3. Normal construction, operation, maintenance and upgrading of electrical networks should therefore remain able to occur.

86. The applicant also confirmed that the designation is not intended to apply to virtual fencing and agricultural technology, as these activities generally operate at frequencies outside the protected satellite receiving bands and at low power.
87. Based on the above, I consider that the EMI restriction will not result in adverse effects on the ongoing use and development of surrounding land. Through the amendments made by the applicant and the further refinements recommended by Mr Sathyendran, the scope of the restriction has been substantially clarified and narrowed so that it applies only to terrestrial radiocommunication services, rather than all electrical infrastructure or equipment that may generate incidental electromagnetic emissions.
88. The amendments to Condition 3 provide greater certainty for landowners and plan users by clearly defining the activities captured by the restriction and expressly excluding a range of electrical infrastructure and equipment that do not constitute terrestrial services. In my view, these amendments appropriately respond to concerns raised by submitters regarding the potential implications of the designation for rural, industrial, infrastructure and renewable energy activities.
89. The recommended amendments will ensure the EMI restriction more closely reflects the protections available under the existing RSM Decision and radiocommunications regulatory framework, rather than introducing a broad new layer of control or blanket restriction over electronic devices and equipment. As a consequence, the EMI restriction will primarily serve to recognise and reinforce existing protections for the satellite ground station, while avoiding unnecessary restrictions on surrounding landowners. The designation would not apply retrospectively to any existing activities. In terms of the activities undertaken by ICC Water Services Group (involving power supplies, motor controllers and inverters) I understand that these would not be restricted by the designation as they do not comprise a 'terrestrial service' and produce incidental EMI only. Therefore, a specific exemption for Council's community water supply works does not appear to be necessary. The applicant may wish to consider whether they would be willing to volunteer this as a specific exemption, for clarification purposes, and address this at the hearing.
90. Overall, I consider the amended EMI provisions to be appropriate, proportionate, and unlikely to impose unreasonable constraints on the use and development of affected land, including both Rural and Industrial Zoned land.

5.6.2 Height of Structures

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91. The NoR proposes a 'horizon mask' to control the height of buildings, structures and vegetation within a 3km radius of the ground station site. The horizon mask is measured at a height of 2m at the boundary of the ground station designation, and extends outwards at an angle of 5°.
92. To calculate the height limit imposed by the horizon mask at specified distances from the ground station site, a calculation can be made as follows:

$$\text{Maximum height} = 2 + d \times \tan(5^\circ)$$

Where d = the horizontal distance from the site boundary (in metres) and $\tan(5^\circ) = 0.08749$

93. The following table indicates the height limit which would be imposed by the horizon mask at different distances within the 3km radius:

Distance from Boundary	Maximum height
100m	10.7m

250m	23.9m
500m	45.7m
1000m	89.5m
2000m	176.9m
3000m	264.5m

94. The NoR explains that it is fundamental to the ongoing operation of the satellite ground station that there is a low horizon, as is the current situation. The application states that the location of the satellite ground station was specifically chosen due to its low horizon and the absence of surrounding built form and the flat topography of the Awarua Plains.
95. The application states that the restriction on built form will be relatively minimal and will essentially only prohibit built form that is within proximity to the satellite ground station. The application notes that effects relating to the restriction are largely confined to the radius covered by the proposed designation and will not have any wider adverse environmental effects.
96. In terms of the proposed 3km extent of the horizon mask control, the applicant explains that the 3km extent provides a clear and readily administered outer boundary while avoiding unnecessary controls beyond the area in which physical obstruction could realistically affect low-elevation satellite communications.

Submissions

97. Several submitters raise concerns relating to the proposed 'horizon mask' height limitation. Submitters are concerned that the 5 degree horizon mask may restrict the height of future buildings, structures, vegetation, infrastructure, renewable energy infrastructure, port-related activities, industrial development and rural activities within the 3km area. Some submitters seek that the NoR be declined or reduced in extent, while others seek more detailed information about the practical implications of the height surface on individual properties.
98. Stewart Family Assets own the Industrial 4 Zoned sites to the north-west of the ground station, and have a resource consent lodged to establish a windfarm on this site, which would not be able to proceed without the approval of SpaceOps (as it was lodged after the NoR was submitted) if the designation is confirmed. Their submission notes that the Industrial 4 Zone provides for buildings and structures up to 35m in height as a controlled activity (and above 35m as a restricted discretionary activity). The submission notes that other ancillary structures to industrial activity such as cranes and chimney stacks would not be able to proceed without SpaceOps' permission. The submission states that the proposed 'horizon mask' is inappropriate and would place further limitations on height which would undermine the integrity of the zone, which anticipates large scale industrial development.
99. The submission from South Port notes that the land surrounding the Awarua satellite ground station has been deliberately zoned to accommodate significant industrial activity, including large-scale structures and heavy-industry operations. South Port considers that the proposed "horizon mask" and associated controls would restrict the height and nature of development within a wide surrounding area, limiting the ability to undertake activities consistent with industrial zoning and intended land use. South Port considers that introducing such constraints conflicts with established planning intent and reduces the functional capability of industrially zoned land. South Port considers that the proposed horizon mask may adversely affect infrastructure necessary to support port, logistics and industrial activity, including cranes and lifting equipment, large scale storage and warehousing structures, electrification and energy infrastructure and expansion of industrial and logistics facilities, with resulting adverse effects on investment certainty and economic growth.

100. Submitter Adam Fuller is concerned that as proposed, the limitation surface could be used to exclude any object. He considers this will be overly restrictive because radio waves propagate, not along an exact "line of sight", but through a volume which can be up to tens of metres in diameter. Mr Fuller states that structures, if slender enough or of high enough permittivity, could be designed to have a negligible effect on the applicants signals.
101. ICC Water Services Group also note that PowerNet will be upgrading the Awarua Siding Road 11KV network to support power distribution to SpaceOps and the location of the ICC water supply investigations. The submitter considers that the airspace limitation will prevent the overhead cabling of the network and request that SpaceOps accommodate the undergrounding or relocation of the power network if the NoR is implemented. The requiring authority may wish to address this request at the hearing. If the requiring authority is not willing to accommodate undergrounding or relocation of the network, a specific exemption for the network is recommended.

Assessment

102. The proposed horizon mask is a restrictive control and therefore has potential to constrain future development on land that is not owned or controlled by SpaceOps. The level of effect will vary according to the distance of each site from the Awarua satellite ground station and the height and nature of the activity proposed. The control is most restrictive closer to the ground station and becomes less restrictive with distance.
103. I accept that the applicant considers that the low horizon is fundamental to the ongoing function of the satellite ground station, and that maintaining open sky visibility is a legitimate purpose of the designation. Mr Sathyendran of AnS Consulting has also confirmed that it is generally accepted that physical barriers (such as buildings or trees) can interrupt the reception of radiocommunication signals. Mr Sathyendran has also advised that even narrow built form such as cranes or wind turbines could still cause interference for the ground station, therefore providing an exemption for narrow structures, as suggested by one submitter, would not be practical². However, Mr Sathyendran also states in his memo dated 27 August 2026 that *"whether a particular structure causes obstruction depends on its azimuth³, elevation, distance, size and construction, and on the elevation angles and directions the station actually relies on. A uniform envelope applied in all directions does not reflect this, and I would expect a station supporting polar-orbiting spacecraft to have directional sensitivities rather than uniform ones. A case-by-case assessment against the station's actual operating requirements would be better matched to the effect"*. In light of this advice, I consider there remains uncertainty as to whether the proposed 5-degree horizon mask extending uniformly across the full 3km radius in all directions represents the most proportionate or appropriately targeted method of managing obstruction effects. Mr Sathyendran's advice suggests that a more refined approach may be possible, informed by the specific operational requirements and directional sensitivities of the ground station.
104. The site to the north-west of the SpaceOps ground station site (99 Awarua Road) is zoned Industrial 4 (Awarua) Zone. As noted in the background section above, this zone was established in 2009 to provide for large scale industrial development. Buildings in this zone would require a controlled activity consent, and Rule IND4Z-R11 imposes a maximum height limit of 35m. For buildings above 35m in height, the activity status is restricted discretionary. In terms of the proposed height restriction proposed by the designation, I note that the horizon mask would place a more stringent height control on part of the Industrial-zoned site than the ICC District Plan currently provides. To comply with the horizon mask, a 35m high building would need to be located approximately 377m from the SpaceOps site. I also note that there is a resource consent lodged for seven wind turbines on the industrial site, which have a proposed maximum height of 200m. None of the proposed turbines would comply with the horizon mask.

² A Sathyendran, personal communication with s42A Report author, 21 August 2026.

³ The azimuth angle is the horizontal direction of an object or destination, measured in degrees clockwise from north (Source: scienceinsights.org)

105. The industrial zone to the north-west is approximately 500ha, and the area restricted by the horizon mask beyond the controlled activity height limit would be a significant proportion of this site. Industrial activities are likely to require large buildings over a large proportion of the site, and future activities are therefore likely to be constrained by the designation. The Concept Plan for the Industrial 4 (Awarua) Zone also contains several areas of the site which cannot be developed (including a heritage area, an area of manuka to be protected, areas of proposed native plantings and landscaping buffers, and areas where industrial activities are to be limited due to low contours), as illustrated below.

APP5-6 Concept Plan – Industrial 4 (Awarua) Zone:

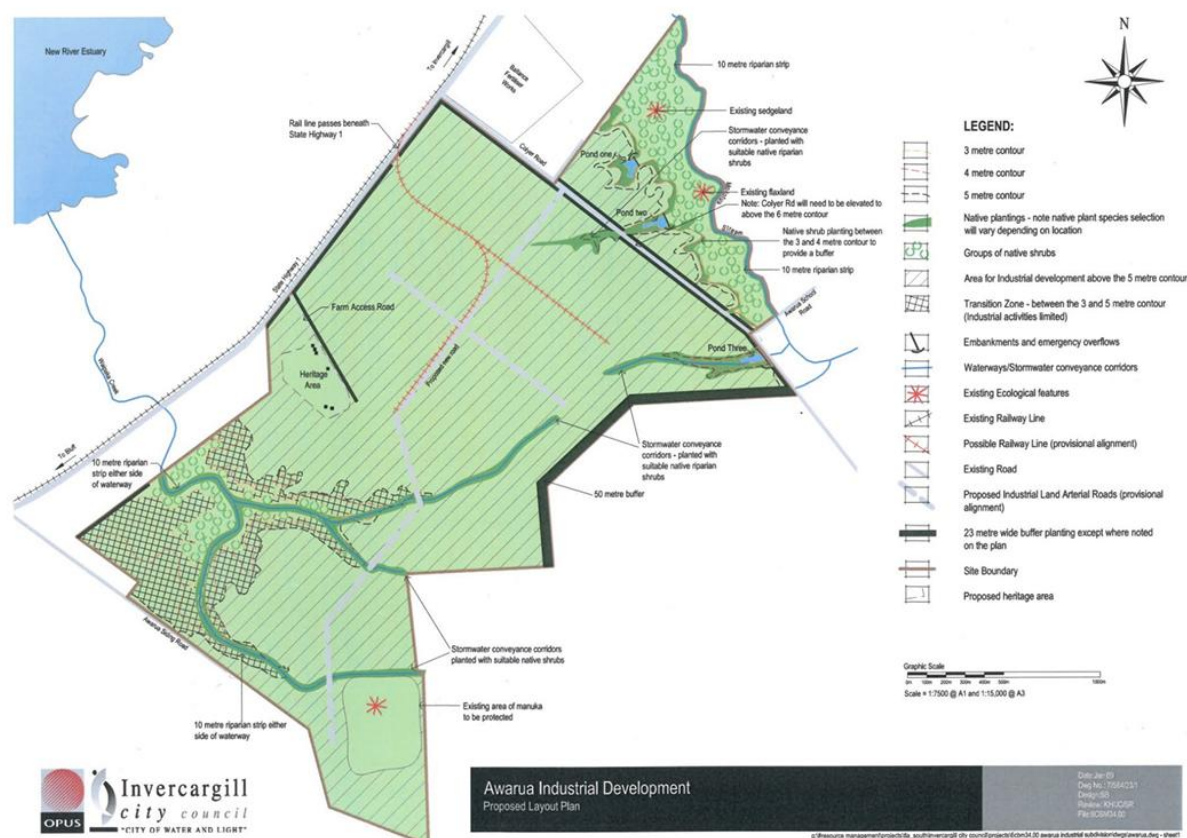


Figure 2: Concept Plan – Industrial 4 (Awarua) Zone. (Source: ICC District Plan)

106. I consider that the effects of the height restriction are potentially significant for landowners where the horizon mask materially affects anticipated development potential, particularly within the Industrial 4 Zone. I consider that placing height restrictions on the Industrial 4 Zone land would potentially result in a portion of the zone being deemed incapable of reasonable use, in line with the intent of the zone. Accordingly, the adverse effects on the property owner (Stewart Family Assets) would be significant.
107. For the majority of remaining land surrounding the ground station, the zoning is Rural, which has a height limit of 10m. A 10m high building would need to be set back approximately 91.4m from the boundary of the ground station site to comply with the horizon mask. The image below shows the ground station designation site, with a 100m buffer shown. This is the approximate area where buildings over 10m in height would be restricted by the horizon mask.

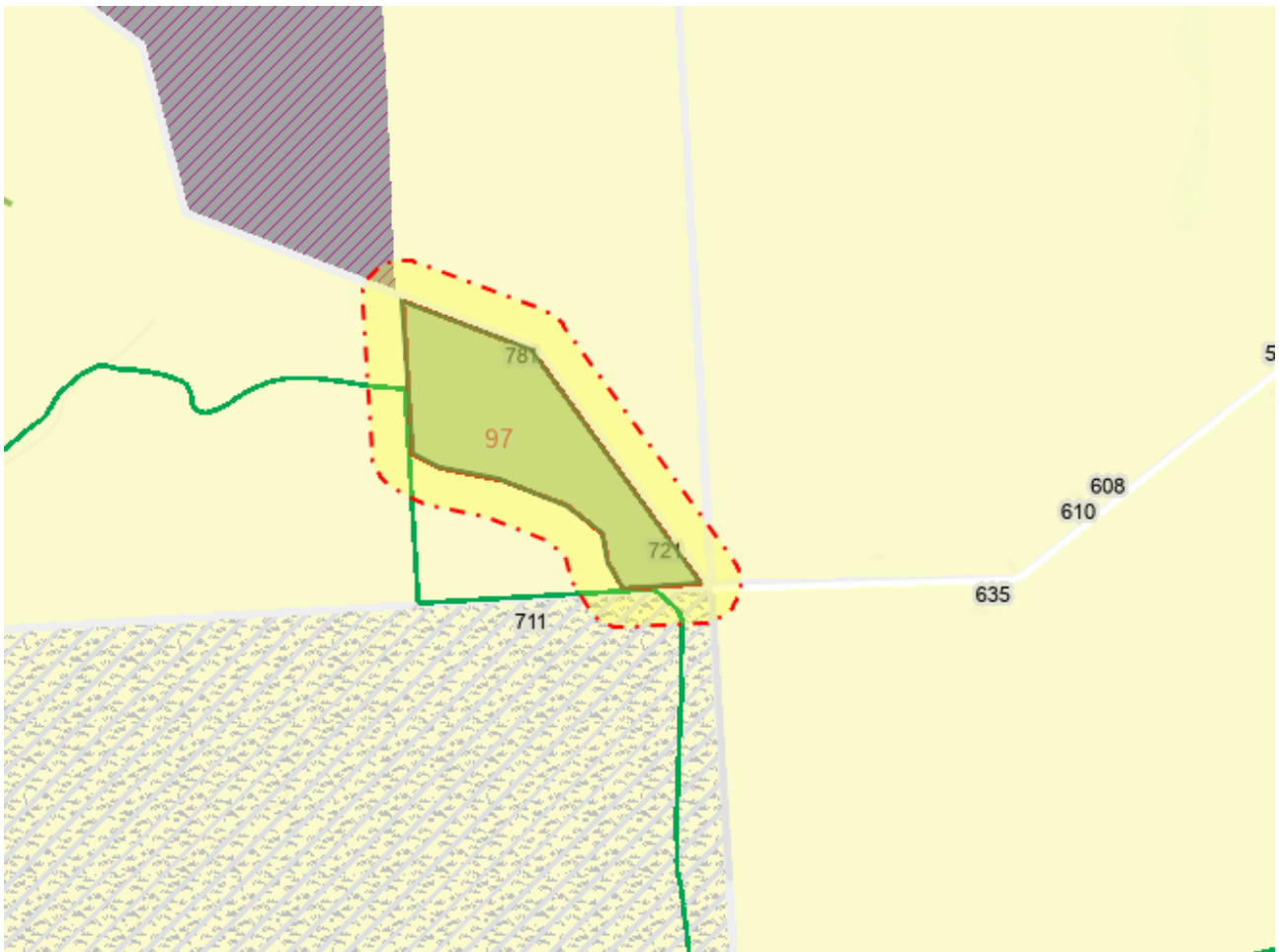


Figure 3: 100m buffer from the Awarua Ground Station Designation Site (Source: ICC District Plan Maps)

108. The site to the north-east at 608-635 Colyer Road is a 392ha property, while 46 Awarua Siding Road (to the west) is a 304ha property. The small area indicated above where a permitted 10m high building would be prevented by the establishment of the horizon mask is considered to be a very small portion of the adjoining large rural properties. In my opinion, restricting the height of buildings and other structures within this area to less than the permitted heights in the Rural Zone would not place an unreasonable burden on the neighbouring rural properties or result in these properties being incapable of reasonable use. The balance areas of both neighbouring sites are significant. These rural properties contain large areas of land where 10m high buildings permitted by the Rural Zone provisions could be established, which are also in compliance with the proposed horizon mask. I also note that the application states that 46 Awarua Siding Road has a non-objection covenant that burdens this property in favour of SpaceOps and also specifically states that the burdened land cannot be developed or used in a way which may cause interference with the use of the SpaceOps site.
109. For other rural properties beyond the two adjoining sites, it is considered that the horizon mask will not have any significant impact on these properties. Due to the distance between the SpaceOps site and the other rural sites, the height limit imposed by the horizon mask is unlikely to be breached by any anticipated rural activity. The closest property is approximately 1.3km away from the boundary with the SpaceOps site, which would equate to a height restriction of approximately 115m.
110. For completeness, I note that the site to the south is conservation land, and the restrictive designation does not apply to this site. The site to the north-west is 99 Awarua Siding Road (the Industrial 4 Zone), which I have discussed above.
111. I note that the ICC Water Services Department have requested undergrounding of the future planned 11kV power network to service their community water supply works. 11kV lines are typically 8-9m high so may be caught by the horizon mask, depending on their location. As

noted above, the requiring authority should address this at the hearing, in respect of either agreeing to underground the lines, or providing a specific exemption from the designation.

112. Overall, it is considered that the height limit imposed by the proposed horizon mask restriction will have potentially significant adverse effects on the future use and development of the Industrial 4 (Awarua) Zone. In my view, these effects are significant and are not justified in this instance. In contrast, the effects from the horizon mask on the surrounding Rural Zoned land are comparatively limited, affecting only a small area of the adjoining rural properties and not materially constraining their ongoing productive use. Accordingly, I consider the effects on Rural Zoned land to be acceptable.

5.6.3 Economic Effects

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113. As noted above, the application identifies a number of positive economic effects associated with the proposed designation. These include providing greater certainty for the continued operation of the Awarua satellite ground station, protecting existing and future investment in the facility, and supporting the continued provision of satellite communication services to domestic and international customers. The application also notes that the ground station contributes to the growth of New Zealand's space sector and has the potential to generate wider economic benefits for Southland through ongoing investment and employment opportunities. The NoR does not include an assessment of any adverse economic effects as a result of the proposed restrictions, but does note that the restrictive designation has the potential to create effects on the owners/occupiers of the Industrial 4 Zone that are minor.

Submissions

114. Several submitters raise concerns regarding the potential economic effects of the designation on surrounding landowners and future development opportunities. Submitters, including Stewart Family Assets and South Port, consider that the proposed horizon mask may constrain development within the Industrial 4 (Awarua) Zone by limiting the height of buildings and structures that would otherwise be anticipated within the zone, as well as constraining industrial activities through the EMI restriction. Concerns are raised that these restrictions could reduce investment certainty, limit future industrial development opportunities, and adversely affect the economic potential of the Awarua industrial area. Submitters also express concerns regarding impacts on land value and the ability to realise the planned development potential of affected properties.

Assessment

115. As outlined in the positive effects section (Section 5.5), I acknowledge that there are positive economic benefits associated with protecting the ongoing operation of the Awarua satellite ground station. The ground station is an established piece of nationally significant infrastructure that supports satellite communications and associated economic activity. Providing greater certainty regarding the future operation of the facility may support continued investment in the ground station and associated activities, with resulting benefits for the local and regional economy.
116. While I acknowledge the economic benefits associated with protecting the ongoing operation of the satellite ground station, I consider those benefits need to be considered in relation to the potential adverse economic effects arising from the horizon mask, particularly in relation to the Industrial 4 Zone.
117. In relation to the EMI provisions, I do not consider there will be any significant adverse economic effects. As discussed previously, the proposed conditions have been substantially amended to clarify that the restrictions apply only to terrestrial radiocommunication services and generally reflect protections already existing under the Radiocommunications regulatory framework. Subject to the recommended amendments, I do not consider the EMI restrictions

will materially constrain existing or anticipated rural, industrial or infrastructure activities, and therefore any associated economic effects are likely to be negligible.

118. In contrast to the EMI restrictions, the horizon mask would introduce new restrictions over a wide area of land surrounding the ground station. While the practical implications for surrounding Rural Zoned land are generally limited, I consider there is potential for adverse economic effects in relation to the constraints placed on the Industrial 4 (Awarua) Zone.
119. The Industrial 4 Zone was specifically established to accommodate large-scale industrial development, warehousing and service activities. The ICC District Plan anticipates larger buildings and structures within the zone, including buildings up to 35 metres in height as a controlled activity. A building of this height would need to be located approximately 377 metres from the boundary of the ground station site in order to comply with the proposed horizon mask. As a result, a proportion of the Industrial 4 Zone would be subject to height restrictions more stringent than those anticipated by the ICC District Plan. The remaining area subject to the horizon mask restriction would also be potentially constrained, as larger structures which may have been approved through a consent process (such as the proposed wind turbines) would be subject to the approval of SpaceOps.
120. I consider that these restrictions have the potential to reduce development flexibility and investment certainty for the Industrial 4 Zone. Future industrial operators may be required to redesign, relocate or forego development opportunities that would otherwise be anticipated within the zone. While the extent of any economic effect has not been quantified, there is potential for reduced development capacity and a corresponding reduction in the economic benefits anticipated from the Industrial 4 Zone.
121. Overall, the most significant economic effects of the proposal arise from the horizon mask rather than the EMI restrictions. The horizon mask has the potential to significantly reduce development potential of the Industrial 4 (Awarua) Zone by constraining activities which are otherwise anticipated by the ICC District Plan. This will likely undermine investment certainty within land specifically identified for future industrial development. The proposed height restrictions have the potential to materially affect the realisation of that strategic purpose.
122. For completeness, while I acknowledge submitters' concerns regarding impacts on land value, I place limited weight on land value effects in isolation. The more relevant consideration is whether the proposed horizon mask may constrain future development opportunities, reduce development flexibility and investment certainty, and the resulting economic effects. It is these considerations, rather than any consequential change in land value, that form the basis of my assessment above.

5.6.4 Reverse Sensitivity Effects

123. Reverse sensitivity is a resource management issue that arises when a new activity establishes in proximity to an existing lawfully established activity and subsequently seeks to constrain, limit, or curtail that existing activity due to actual or perceived adverse effects. Reverse sensitivity commonly occurs where sensitive activities establish near infrastructure, industry, transport networks or primary production activities and later seek restrictions on the operation of those activities.

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124. The NoR does not specifically assess reverse sensitivity in the assessment of effects. Reverse sensitivity is addressed in the 'Other Matters' section of the NoR, where it is stated that the restrictive designation is essentially required due to potential reverse sensitivity issues, particularly in relation to the Industrial 4 zoned land.
125. The purpose of the proposed designation is to protect the operation of the Awarua satellite ground station by restricting activities that may obstruct satellite communications or generate harmful EMI. As such, the proposal is intended to protect the ground station from the effects of surrounding land uses, rather than manage the effects of the ground station on surrounding activities. The proposal does not involve the establishment or expansion of a sensitive activity, nor does it seek to manage adverse effects generated by the ground station on neighbouring land uses.

Submissions

126. The submission from Stewart Family Assets contains an open letter to the Mayor and Councillors of the Invercargill City Council, dated 15 December 2025. This letter states that the NoR controls would prevent buildings on 4 hectares of the Calder Stewart landholding from reaching the permitted height level of 35 metres, prohibit industrial activities anticipated and provided for on the Awarua Quadrant from establishing that result in electromagnetic emissions and have significant reverse sensitivity effects on activities anticipated on the Calder Stewart landholding.

Assessment

127. In my view there is an existing reverse sensitivity effect which is already occurring via the proposal to limit activities on adjoining land through the proposed designation – the ground station has been established and developed next to a zone which provides for large scale industrial activities. The ground station is sensitive to the activities provided for in the Industrial Zone, and is seeking to curtail the development of the Industrial Zone through the establishment of the restrictive designation.
128. In this respect, I acknowledge that the purpose of the designation is to protect an existing piece of nationally significant infrastructure from the adverse effects of future incompatible activities. The designation seeks to proactively manage potential reverse sensitivity effects by providing a framework to ensure that future land use and development remains compatible with the operational requirements of the ground station.
129. The proposed designation itself will not create any new reverse sensitivity effects. The designation does not introduce a new sensitive activity into the receiving environment as the ground station is already existing. The NoR does not increase the scale or intensity of activities occurring on the ground station site. Rather, the designation seeks to implement a planning mechanism intended to avoid future incompatibility between the Awarua satellite ground station and surrounding land uses, by managing the location and nature of future activities within the surrounding area.
130. Accordingly, I consider that the proposed designation itself will not result in any actual or potential reverse sensitivity effects.

5.6.5 Heritage and Cultural Values

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131. The NoR does not identify any physical works or land disturbance associated with the proposed restrictive designation. The designation seeks to manage land and airspace by restricting electromagnetic emissions and structures from being established around an existing satellite ground station. Public conservation land and the coastal marine area are excluded from the designation extent. The NoR states that the restrictive designation will not have any impact on Māori culture or on heritage.

Submissions

132. I note that as part of the processing of the ground station designation (MIC-2025-19), consultation with mana whenua was undertaken by the applicant, and written approval was provided by Te Ao Mārama Inc (TAMI) for both NoR applications (MIC-2025-19 and MIC-2025-20). As part of the consultation process, the extent of the airspace designation (MIC-2025-20) was amended at the request of TAMI, to exclude all conservation land and the coastal marine area from the airspace designation. On the basis of the amended application, unconditional written approval was supplied by TAMI, and no submission was received from mana whenua.

Assessment

133. As the NoR does not authorise physical works, earthworks, vegetation clearance, or activities within the coastal marine area or public conservation land, I do not consider that it will directly affect known historical or cultural sites or Māori cultural values in the same way as a designation involving physical works may. The exclusion of public conservation land and the coastal marine area also reduces the potential for effects on sensitive cultural environments.

134. Affected party approval has been provided by TAMI, and as such, no regard is to be had on any effects on rūnanga. As the designation does not involve any physical works, it is not necessary to include an accidental discovery protocol as a condition on the designation. I therefore consider the adverse effects on heritage and cultural values to be less than minor.

6 Assessment Against Section 171 and Part 2 of the RMA

6.1 Section 171 Assessment

135. The following assessment considers the NoR against the criteria set out in Section 171(1) and 171(1B) of the RMA.

6.2 National Policy Statements - Section 171(1)(a)(i)

136. Section 171(1)(a)(i) requires the council, subject to Part 2, to consider the effects on the environment of allowing the NoR, having particular regard to any relevant provisions of a national policy statement. The following national policy statements are considered to be relevant:

- (a) National Policy Statement for Electricity Networks
- (b) National Policy Statement for Infrastructure

6.2.1 National Policy Statement for Electricity Networks 2008:

137. The National Policy Statement on Electricity Networks (NPS-EN) seeks to ensure the national significance of the electricity network is recognised, protected and provided for, so that the network:
- a) is upgraded, improved and resilient to provide for the social, economic and cultural wellbeing of present and future generations and their health and safety;
 - b) is developed and operated in a timely, efficient and ongoing manner while managing adverse effects from or on the EN; and
 - c) supports achievement of New Zealand's climate change mitigation and renewable energy targets.
138. The NPS-EN is relevant, as the restrictive designation could potentially apply to the electricity network where it is located within the 3km radius of the ground station. The applicant has addressed the potential effect on the electricity distribution network in their 'Response to Council Engineering Review' dated 7 August 2026.
139. The applicant states that properly operating electrical distribution infrastructure, including substations, transformers, switchgear and associated electrical equipment, is not intended to be regulated by the designation, as these are not terrestrial services. They note that normal construction, operation, maintenance and upgrading of electrical networks should therefore remain able to occur.
140. However, electrical network infrastructure may incorporate ancillary terrestrial services, including licensed radio communications, microwave links and SCADA radio systems used for network monitoring and control. It is those terrestrial radiocommunication services, rather than the electrical infrastructure itself, that may be subject to the EMI restriction.
141. I accept that, subject to the recommended amendments to the designation conditions, the EMI provisions are unlikely to materially constrain the operation, maintenance or upgrading of electricity infrastructure. While ancillary terrestrial services associated with network operation may be subject to the proposed restriction, this reflects protections already provided through the existing radiocommunications framework and is not considered to impose significant additional constraints.
142. I understand that typical overhead electricity distribution lines are generally between 8m and 15m in height. Accordingly, the proposed horizon mask may constrain the location of overhead

electricity infrastructure in close proximity to the ground station. However, beyond the immediate area adjoining the ground station, the height permitted by the horizon mask increases with distance, and is unlikely to restrict the majority of electricity network infrastructure. As previously noted, it is recommended that the requiring authority gives consideration to a specific exemption for the power network where it is in close proximity to the ground station and would breach the horizon mask, or agree to the undergrounding of any distribution lines where necessary.

143. Based on the above, the proposed designation is considered consistent with this NPS-EN.

6.2.2 National Policy Statement for Infrastructure 2025

144. The National Policy Statement for Infrastructure (NPS-I) provides national direction under the Resource Management Act 1991 (RMA) to guide the efficient development, management, and upgrading of infrastructure across New Zealand. It recognises infrastructure as nationally significant and aims to support community wellbeing, health, and safety, while ensuring environmental impacts are appropriately managed.

145. The NPS-I is relevant, as it applies broadly to infrastructure activities, including radiocommunications networks.

146. The objective of the NPS-I is to:

- a) *ensure the national, regional and local benefits of infrastructure are provided for;*
- b) *enable infrastructure to support the social, economic and cultural wellbeing of people and communities and their health and safety;*
- c) *enable infrastructure to support the development and change of urban and rural environments to meet the diverse and changing needs of present and future generations;*
- d) *ensure infrastructure is well-functioning, resilient and compatible, as far as practicable, with other activities; and*
- e) *ensure infrastructure is delivered in a timely and efficient manner while managing adverse effects from or on infrastructure.*

147. Policy 10 outlines the requirements for managing the interface between infrastructure and other activities:

Policy 10: Planning for and managing the interface and compatibility of infrastructure with other activities

1. *Decision-makers on planning instruments must manage the interface between existing and planned infrastructure and other activities to ensure:*
 1. *infrastructure and other activities are as compatible as practicable;*
 2. *the safe, efficient and effective operation, maintenance and minor upgrades, and major upgrades of existing or planned infrastructure are not compromised by the adverse effects of other activities; and*
 3. *infrastructure activities that are compatible with each other are co-located, while recognising that some types of infrastructure are not compatible.*
2. *Decision-makers on planning instruments must:*
 1. *engage with infrastructure providers to:*
 1. *understand their existing and planned infrastructure activities and medium to long-term plans;*
 2. *identify appropriate buffers and other methods to protect existing and planned infrastructure from the adverse effects of new or intensified sensitive and incompatible activities, including direct effects, reverse sensitivity effects, and risks to health and safety;*
 3. *support the strategic integration of infrastructure with land use activities;*
 2. *identify:*
 1. *activities that are particularly sensitive to the effects of infrastructure;*

2. *activities that are compatible with infrastructure, or potentially compatible with appropriate buffers, design standards or mitigation measures;*
3. *infrastructure activities that are sensitive to the effects of other infrastructure;*
3. *apply a range of methods, including, where appropriate:*
 1. *the use of buffers in plans to manage sensitive activities, including new or intensified sensitive activities, and incompatible activities near infrastructure;*
 2. *design standards to manage the effects of infrastructure on other activities;*
 3. *special purpose zoning and other spatial-planning layers; and*
4. *ensure that measures to avoid, remedy or mitigate the effects of other activities on infrastructure are consistent with relevant international standards (that are recognised or used in New Zealand), national standards and recognised best practice standards and methodologies.*

148. The proposed designation is considered to be generally consistent with the objective and supporting policies of the NPS-I. The NPS-I contains a strong enabling direction for nationally, regionally and locally significant infrastructure, recognising that infrastructure is essential to supporting community wellbeing, economic activity, resilience, connectivity and the needs of present and future generations. The Awarua satellite ground station is an established piece of nationally significant radiocommunications infrastructure. The ongoing operation of the ground station provides strategic infrastructure benefits extending beyond the Invercargill District and Southland Region.
149. The objective of the NPS-I specifically seeks to ensure that infrastructure remains well-functioning and resilient, and that adverse effects on infrastructure are appropriately managed. Policy 10 similarly recognises the need for planning instruments to protect infrastructure from the adverse effects of incompatible activities, including through the use of buffers, design standards and other planning mechanisms where appropriate. In this regard, the proposed designation is a recognised planning tool that seeks to manage the interface between the ground station and surrounding activities to ensure the continued effective operation of nationally significant infrastructure. The proposal recognises and provides for the ongoing operation of an established satellite ground station by seeking to limit potential interference from incompatible activities.
150. Overall the proposal is considered to be consistent with the NPS-I.

6.3 Southland Regional Policy Statement (SRPS) – Section 171(1)(a)(iii)

151. The SRPS includes the following objectives and policies which are relevant to this application.

Rural:

Objective RURAL.1 – Sustainable use of rural land resource

Achieve sustainable use of Southland's rural land resource, in respect of:

- a. *agriculture and primary sector activities;*
- b. *subdivision, use and development activities;*
- c. *earthworks and vegetation clearance activities;*
- d. *the use of soil resources;*
- e. *mineral extraction activities; and*
- f. *on-site wastewater systems.*

Objective RURAL.2 – Life-supporting capacity of soils

Safeguard the life-supporting capacity, mauri and health of soils in rural areas, and prevent or minimise soil erosion and sedimentation from land use soil disturbance.

Policy RURAL.1 – Social, economic and cultural wellbeing

Recognise that use and development of Southland's rural land resource enables people and communities to provide for their social, economic and cultural wellbeing.

Policy RURAL.2 – Land use change and land development activities

Manage subdivision, land use change and land development activities in rural areas of Southland, in a way that maintains or enhances rural amenity values and character.

Comment

152. The proposed designation will enable the ongoing use and development of rural land, in a manner that supports social and economic wellbeing while managing potential incompatibility with the adjacent ground station. As noted above, the EMI conditions associated with the designation are recommended to be amended to ensure that no greater restriction is placed on surrounding land uses beyond those restrictions already in place via the RSM decision and existing legislation.
153. The height restriction imposed by the 'horizon mask' condition will have limited impact on surrounding rural land or potential future activities. A small portion of land directly adjacent to the ground station (within 91.4m of the boundary with the ground station) will be prevented from establishing buildings which comply with the permitted height limit specified in the Rural Zone. As previously discussed, the two adjacent sites which are impacted are both over 300ha in area and have adequate alternative options for establishing buildings associated with their farming activities on other parts of their properties. It is considered that the proposed restrictive designation will maintain the ability of the surrounding rural land to be used for productive purposes and achieve sustainable use of Southland's rural land resource.
154. Overall, the application is considered to be consistent with the rural objectives and policies in the SRPS.

Infrastructure:

Objective INF.1 – Southland's infrastructure

Southland's regionally significant, nationally significant and critical infrastructure is secure, operates efficiently, and is appropriately integrated with land use activities and the environment.

Policy INF.1 – Regional, national and critical infrastructure

Recognise the benefits to be derived from, and make provision for, the development, maintenance, upgrade and ongoing operation of regionally significant, nationally significant and critical infrastructure and associated activities.

Policy INF.2 – Infrastructure and the environment

Where practicable, avoid, remedy or mitigate the adverse effects of infrastructure on the environment. In determining the practicability of avoiding, remedying, or mitigating adverse effects on the environment, the following matters should be taken into account:

- a. *any functional, operational or technical constraints that require the physical infrastructure of regional or national significance to be located or designed in the manner proposed;*
- b. *whether there are any reasonably practical alternative designs or locations;*
- c. *whether good practice approaches in design and construction are being adopted;*
- d. *where appropriate, and such measures are volunteered by a resource user, whether any significant residual adverse effects can be offset or compensated for; and*
- e. *the need to give effect to the NPSET (2008) including that planning and development of the transmission system should seek to avoid adverse effects on outstanding natural landscapes, areas of high natural character and areas of high recreation value and amenity and existing sensitive activities.*

Policy INF.3 – Infrastructure protection

Protect regionally significant, nationally significant and critical infrastructure, particularly from new incompatible land uses and activities under, over or adjacent to the infrastructure.

Comment:

155. I consider that the satellite ground station falls within the definitions of regionally significant and nationally significant infrastructure, as contained within the SRPS. The ground station contributes to the wellbeing and health and safety of the people and communities of the region, and extends beyond the region, as it supports national and international communications networks, and contributes to economic activity, resilience, and connectivity.
156. The proposed designation seeks to protect the ongoing operation of this infrastructure by managing activities within the surrounding area that could adversely affect the ground station's ability to receive signals from spacecraft. In principle, this is consistent with Objective INF.1 and Policies INF.1 and INF.3, which recognise the importance of infrastructure and the need to protect it from incompatible activities.
157. In relation to EMI, it is considered that, subject to amendments recommended by Council's engineering peer reviewer and reflected in the recommended conditions, the proposal is generally consistent with the intent of the infrastructure provisions. The revised conditions clarify that the controls apply to terrestrial radiocommunication services and are intended to align with protections already recognised through the radiocommunications regulatory framework. As a result, I consider the EMI restrictions are an appropriate mechanism to assist in protecting the operation of the ground station, consistent with Policy INF.3. The proposed horizon mask also seeks to protect the functioning of the ground station by maintaining open sky visibility and avoid physical obstruction in close proximity to the facility.
158. Overall, I consider the proposed designation is generally consistent with the infrastructure objectives and policies of the SRPS because it seeks to protect the ongoing operation of nationally and regionally significant infrastructure.

6.4 Invercargill City Council District Plan – Section 171(1)(a)(iv)

159. The ICC District Plan includes the following objectives and policies which are relevant to this application.

Infrastructure:

Objective INF-O1:

Invercargill's local, regional and national infrastructure is secure and operates efficiently.

Objective INF-O2:

Infrastructure is developed, operated, maintained and upgraded whilst:

- 1. Efficiently and effectively meeting the current foreseeable needs within and between Districts.*
- 2. Fulfilling functional, locational, technical, and operational requirements and avoiding, remedying or mitigating the effects on the environment.*

Objective INF-O3:

Existing infrastructure is sustainably managed and protected from incompatible subdivision, use and development.

Objective INF-O5:

To provide for the sustainable, secure and efficient operation, maintenance, upgrading and development of infrastructure while seeking to avoid, remedy or mitigate adverse effects on the environment to the extent practicable, and while recognising the technical and operational requirements and constraints of the networks.

Objective INF-O6:

To recognise the importance of infrastructure to the social and economic well-being of the City, the Southland region and the nation.

Policy INF-P1 Existing Infrastructure:

To recognise and provide for the continued operation, maintenance and upgrading of local, regional and national infrastructure and associated activities.

Policy INF-P2 Management of effects:

Where practicable, avoid, remedy or mitigate adverse environmental effects arising from the development, construction, operation, maintenance and upgrading of infrastructure on the environment.

Policy INF-P3 Reverse Sensitivity:

To protect local, regional and national infrastructure from new incompatible subdivision, land uses and development under, over or adjacent to the infrastructure.

Policy INF-P6 Functional Need, Technical and Operational Requirements:

To recognise that infrastructure can have a functional, technical or operational need for a particular location.

Policy INF-P7 Location of facilities:

To encourage radio communication and telecommunication facilities to be located outside residential areas, unless there is a functional need to locate there.

Comment

160. The proposed designation is considered to be generally consistent with the above Infrastructure Objectives and Policies, as it seeks to protect the ongoing operation and functionality of the Awarua satellite ground station, which is an established piece of nationally significant radiocommunication infrastructure. The designation is specifically intended to avoid activities occurring in the vicinity of the ground station that could compromise its operation through EMI or obstruction of satellite line-of-sight, and is considered consistent with Objectives INF-O1, INF-O2 and INF-O3, INF-P1 and INF-P3, which seek to ensure that infrastructure remains secure, operates efficiently, and is protected from incompatible subdivision, use and development.
161. The proposal is particularly aligned with Policy INF-P6, which recognises that infrastructure can have a functional, technical or operational need for a particular location. As noted, the proposed restrictive designation recognises the functional, technical and operational needs of the existing ground station, particularly its need to operate in an environment free from physical obstructions and harmful EMI. The application material explains that the site was deliberately established in its current location due to the low horizon, relatively undeveloped rural setting, and lack of interference, all of which are fundamental to the effective operation of the ground station. The proposed designation seeks to ensure these operational requirements are maintained over the long term. These requirements cannot readily be replicated through alternative design measures and provide a strong justification for seeking a level of protection through a designation mechanism.
162. The proposal is also consistent with Policy INF-P7, as the ground station is located within a rural environment away from residential areas. The facility has operated in this location for many years and the designation seeks to maintain the environmental conditions that support its operation.
163. In relation to Policy INF-P2 and the requirement to avoid, remedy or mitigate adverse environmental effects, I consider the proposal is inconsistent with this provision. While the proposed EMI controls are generally considered appropriate, particularly following amendments recommended through the engineering review process, the proposed horizon

mask has the potential to adversely affect future development opportunities on some surrounding properties. As discussed in Section 5.5.2, these effects are most pronounced in relation to the adjacent Industrial 4 Zone, where the ICC District Plan anticipates larger-scale industrial buildings and structures. The proposed height restrictions have the potential to constrain development that would otherwise be anticipated within that zone and therefore create tension with the policy framework that seeks to enable both infrastructure and planned land use development.

164. Notwithstanding these concerns, I recognise that the purpose of the designation is to protect existing nationally significant infrastructure from incompatible activities, which is consistent with Policy INF-P3. The key issue is therefore not whether protection is appropriate, but whether the extent and form of that protection appropriately balances the operational requirements of the ground station against the development expectations of affected landowners. This matter is addressed further in the assessment of effects and the evaluation under sections 171(1)(b)(i) and 171(1)(b)(ii) of the RMA undertaken below.
165. Overall, I consider the proposal is generally consistent with the Infrastructure Objectives and Policies of the ICC District Plan, particularly in relation to protecting the ongoing operation of nationally significant infrastructure.

Rural Zone:

Objective RURZ-O1

The rural environment is maintained and enhanced while allowing for productive rural activities to be undertaken.

Objective RURZ-O2

Provide for the use and development of land within the rural area while maintaining, and where practical enhancing, amenity values.

Policy RURZ-P2 Rural Activities:

To provide for rural activities to establish and operate within the Rural Zone.

Policy RURZ-P17 Electrical Interference:

To avoid nuisance from electrical interference.

Comment

166. The proposed designation is considered to be consistent with the above Rural Zone objectives and policies. The designation will enable the continued use and development of land for rural purposes, with minimal height restrictions on a small proportion of adjacent land. As discussed in Section 5.5.2, the adjoining rural properties are large landholdings and only a small portion of those sites would be affected by height restrictions that are more stringent than the existing 10m height limit provided for within the Rural Zone.
167. I consider that the proposal is consistent with Objectives RURZ-O1 and RURZ-O2 and Policy RURZ-P2, as it will not materially affect the ability of surrounding landowners to continue undertaking productive rural activities. Buildings associated with rural activities can still be established across the vast majority of the surrounding Rural Zone, and there remains adequate flexibility for ongoing farm management and development.
168. The proposal will assist in avoiding EMI that could adversely affect the operation of the satellite ground station and is considered to be consistent with Policy RURZ-P17.
169. Accordingly, I consider the proposal is generally consistent with the Rural Zone objectives and policies of the ICC District Plan.

Industrial 4 (Awarua) Zone

Objective IND4Z-O1

Sufficient land is available for future development of large industrial warehousing and service activities which, because of their scale, are encouraged to locate in appropriate areas within the Invercargill City District outside the urban area.

Objective IND4Z-O7

Reverse sensitivity effects on permitted and lawfully established activities within or adjacent to the Industrial 4 Zone as a result of any future subdivision or land use activities within the Industrial 4 Zone are avoided.

Policy IND4Z-P1 Industrial 4 (Awarua) Zone:

To establish and implement the Industrial 4 Zone and to enable its use by industrial activities.

Policy IND4Z-P5 Electrical Interference:

To avoid nuisance from electrical interference.

Policy IND4Z-P24 Reverse Sensitivity:

To locate and design activities to avoid reverse sensitivity effects on permitted and lawfully established activities on or adjacent to the Industrial 4 Zone.

Comment

170. The proposed restrictive designation will extend over the majority of the Industrial 4 (Awarua) Zone, and will impose restrictions on EMI and height of buildings, structures and vegetation. As previously discussed, the horizon mask will impose a height restriction for the south-east corner of the Industrial 4 Zone which is below the height limit contained in the Industrial 4 Zone rules, which is considered to significantly impact the ability of this portion of the site to be developed in line with the purpose and intent of the zone. It is considered that this is contrary to Objective IND4Z-O1 and IND4Z-P1, which seek to ensure sufficient land is available for large industrial buildings and activities. The EMI restriction seeks to avoid nuisance from electrical interference and is considered consistent with Policy IND4Z-P5.
171. Objective IND4Z-O7 and IND4Z-P24 seek to avoid reverse sensitivity effects on permitted and lawfully established activities within or adjacent to the Industrial 4 Zone. These provisions recognise that there may be incompatibility between activities within the Industrial 4 Zone and surrounding land uses. To address this the ICC District Plan includes a Concept Plan and provisions to guide development of the zone and require all applications to include an analysis of the proposal on the defined amenity values of the Industrial 4 Zone. Rather than creating a reverse sensitivity effect, I view this proposal as reverse sensitivity in action – the satellite ground station is sensitive to the future development of the Industrial Zone, and is seeking to restrict future activities from establishing within that zone which would affect the existing ground station. I consider that this is contrary to Policy IND4Z-P24.

6.4.1 Conclusion

172. Overall, the proposed EMI restriction aspect of the NoR is considered to be consistent with the objectives and policies in the SRPS and the ICC District Plan, as it will protect the nationally and regionally significant piece of infrastructure, being a satellite ground station, by enabling its ongoing operation free from interference. It is considered that this portion of the designation (as amended by the recommended conditions) aligns with the existing protections provided by the RSM Decision and wider framework governing radiocommunications. The establishment of the EMI restrictive designation will not introduce any new restrictions, but will ensure property owners within the 2km radius of the ground station are made aware of the restrictions that already apply, by establishing the designation in the ICC District Plan. It is considered that the EMI restriction strikes an appropriate balance between protecting essential infrastructure and managing potential effects on surrounding property owners, recognising the critical role of the satellite ground station and the associated functional, locational and technical

requirements of the infrastructure, and the need to protect it to provide for its ongoing operation.

173. In terms of the 'horizon mask' restriction aspect of the NoR, the proposal creates tension with the objectives and policies of the ICC District Plan, by restricting the height of industrial buildings within the Industrial 4 (Awarua) Zone, below the height specified in the Industrial 4 Zone rules. The application of the horizon mask over the Industrial 4 Zone is considered to be contrary to the objectives and policies within the Industrial 4 Zone.

6.5 Alternative Sites, Routes or Methods – Section 171(1)(b)(i)

174. Section 171(1)(b)(i) of the RMA requires that when considering a NoR, the territorial authority must, subject to Part 2 of the RMA, consider the effects on the environment of allowing the designation. In doing so, if the requiring authority does not have an interest in the land sufficient for undertaking the work, particular regard must be had to whether adequate consideration has been given to alternative sites, routes, or methods of undertaking the work.
175. SpaceOps does not have an interest in all the land subject to the NoR, and therefore consideration of alternatives is necessary.
176. The assessment of alternatives undertaken by the applicant is discussed in Section 11 of the NoR which notes that the Awarua site was specifically selected because of its low horizon, lack of built form or landforms in the vicinity which would interrupt radiowaves and absence of EMI. The applicant considers there to be no suitable alternative site in New Zealand that would meet the operational requirements of the ground station. The applicant therefore concludes that it would not be functional, feasible or logical for the activity as a whole to relocate to another site. In relation to alternative methods, the applicant considers that a designation is the most appropriate mechanism to protect the low horizon and radiofrequency environment necessary for the ongoing operation of the ground station, while noting that EMI is already subject to protection under the existing RSM framework.
177. I accept that the site of the ground station is existing and was specifically chosen due to its specific characteristics. It may be useful for the requiring authority to provide further information at the hearing on the site selection process from when the ground station was first established, to demonstrate that there were no other suitable sites.
178. However, I do note also that the Industrial 4 Zone was introduced into the ICC District Plan in 2009, therefore the applicant would have been aware of the development potential of this zone prior to the substantial expansion of the ground station in 2019 and again in 2023. The existing Industrial 4 Zone is part of the surrounding environment and it could not be assumed that lack of built form on this site is a characteristic that could be relied on in perpetuity.
179. Aside from the site selection, the extent of the designation and the restrictions imposed are also alternatives that can be considered.
180. In terms of the horizon mask, the applicant states that the 3km extent of the horizon mask provides a clear and readily administered outer boundary while avoiding unnecessary controls beyond the area in which physical obstruction could realistically affect low-elevation satellite communications.
181. I also note that the engineering review undertaken by Mr Sathyendran identified that there is already background EMI occurring, and that consideration of mitigation solutions to reduce the exposure at the receiving site (the ground station) should be considered further by the applicant, such as filtering, shielding, raising antenna elevations, and management of existing background interference. The engineering review also questioned the basis of the horizon mask extending for 3km.
182. The applicant responded to the engineering peer review, and provided detailed information relating to the basis for the horizon mask, the 2m high measurement point, the angle of the horizon mask and the 3km extent. This included discussion of alternatives, including why a more stringent 0.5 or 3-degree horizon mask was not adopted.

183. The applicant also noted that the proposed designation forms one component of a broader interference management approach rather than replacing reasonable mitigation at the ground station. They commented as follows:

With specific regard to onsite mitigation measures, filtering cannot remove interference occurring within the same frequency as the desired satellite signal, shielding cannot be applied in a way that blocks terrestrial interference without also obstructing low elevation satellite signals, and raising antennas would not usefully preserve low angle visibility, would make the antenna more susceptible to distant interfering sources and may introduce structural/operational implications. Space Ops, to date, has implemented all practical mitigation measures that it can and will continue to do so in the future.

Preserving a low and unobstructed horizon is a fundamental operational requirement of the ground station. While onsite mitigation measures such as receiver filtering, shielding or equipment upgrades may assist in managing certain sources of electromagnetic interference, they do not address physical obstruction of the line of sight between the ground station antennas and orbiting spacecraft. Tall buildings, wind turbines, telecommunications masts and vegetation that penetrate the required horizon mask cannot be mitigated through onsite engineering solutions. Once an obstruction exists within the satellite acquisition and tracking envelope, it has the potential to delay or prevent satellite acquisition, reduce available communication windows, and compromise the operational capability of the ground station.

Therefore, preserving the low horizon is a necessary outcome that can only be effectively achieved through land use controls, such as the proposed designation.

184. This additional information was reviewed by Mr Sathyendran, who then provided additional comments, dated 27 August 2026 (refer Appendix 2). Mr Sathyendran noted that, whether a particular structure causes obstruction depends on its azimuth, elevation, distance, size and construction, and on the elevation angles and directions the station actually relies on. A uniform envelope applied in all directions does not reflect this, and he would expect a station supporting polar-orbiting spacecraft to have directional sensitivities rather than uniform ones. A case-by-case assessment against the station's actual operating requirements would be better matched to the effect.
185. Based on the comments of Mr Sathyendran, I consider that the requiring authority has not adequately satisfied the requirements of section 171(1)(b)(i) in terms of the horizon mask, in that adequate consideration has not been given to alternative sites, routes, or methods of undertaking the work. Mr Sathyendran has indicated that a more detailed assessment providing consideration of directional sensitivities, rather than a 3km restriction in all directions would be appropriate.

6.6 Reasonable Necessity for Work and Designation – Section 171(1)(b)(ii)

186. Section 171(1)(b)(ii) of the RMA requires that particular regard must be had to whether the work and designation are reasonably necessary for achieving the objectives of the requiring authority for which the designation is sought.
187. Section 12 of the NoR sets out the reasons why the applicant considers the designation to be reasonably necessary. The NoR notes that SpaceOps NZ is a requiring authority pursuant to Section 166 of the Act as it is an approved network utility operator, and the designation is required to enable SpaceOps NZ to continue to operate its satellite ground station by ensuring that the surrounding land and air remains free of conflicting built form and EMI that could create issues with its ongoing operation and objectives, which are described as follows:
- Ensure that the satellite ground station can continue to run in an efficient manner by sending and receiving radiotelecommunications as defined in the Radiocommunications Act 1989.

- Ensure that activities on surrounding land do not interfere with the already established protection zone for space research, space operation and Earth exploration-satellite services.
- Ensure that the ICC District Plan is aligned with the RSM protection zone.

188. Therefore, SpaceOps consider that the designation is deemed reasonably necessary.

189. The SpaceOps response to the engineering review provides further information as to the necessity of the restrictions sought:

- *The antennas at Awarua Satellite Ground Station primarily communicate with spacecraft in low Earth orbit. These spacecraft are between 400 and 800 km above the Earth and orbit the Earth every 1½ hours or so. The spacecraft can only communicate with ground stations that are in line of sight with it. At best the spacecraft will traverse the sky immediately above the ground station, starting at the horizon some 2500 kilometres away. In these cases, the satellite “pass” (the period the spacecraft can communicate with the ground station) will be a little over 8 minutes’ duration. Spacecraft that do not travel immediately overhead may only be visible for a few minutes, and they may never get much above the horizon.*
- *Because a low Earth orbiting spacecraft will only be able to communicate with a few – perhaps only one – ground stations each orbit, it is important for the spacecraft operator to maximise the time the spacecraft can communicate with the ground station during a pass. The lower to the horizon the antenna can point, the longer the pass time that can be accomplished. Because of the possibilities of interfering with terrestrial services and the effects of the atmosphere on radio propagation, spacecraft operators generally accept that 5° elevation mask is a world-wide limit and design their missions accordingly. Lower elevations are desirable and Radio Spectrum Management will allow ground stations to transmit down to 3° elevation. For rocket launches, it is important to be able to maximise the pass period. For launches, it is usual to start tracking the rocket at close to 0° elevation.*
- *Space Ops is seeking 5° elevation mask protection only because a 0.5° or 3° elevation mask would have very far-reaching impact on the surroundings and would be impracticable.*
- ...
- *Preserving a low and unobstructed horizon is a fundamental operational requirement of the ground station ... Once an obstruction exists within the satellite acquisition and tracking envelope, it has the potential to delay or prevent satellite acquisition, reduce available communication windows, and compromise the operational capability of the ground station.*

190. It is accepted that the designation will achieve the objectives of the requiring authority. The designation will provide protection to the ground station so that it can operate at an optimal level without physical obstruction or EMI. However, based on the information provided by the applicant, I understand that even where some physical obstruction occurs, the ground station would still be capable of operating, albeit with reduced efficiency or shorter communication windows. While this would not be the requiring authority's preferred outcome, it demonstrates that complete protection of the horizon is not essential for the ongoing operation of the facility. The engineering review has also highlighted that applying a uniform height restriction in all directions may not be necessary, as it is expected that a ground station supporting polar-orbiting spacecraft to have directional sensitivities rather than uniform ones.

191. It is understood that the threshold of “necessary” has been described in caselaw as falling between expedient or desirable on the one hand, and essential on the other.⁴ While I accept that some degree of horizon protection is reasonably necessary to achieve the objectives of

⁴ Queenstown Airport Corp Ltd v Queenstown Lakes District Council [2013] NZHC 2347, para [94].

the requiring authority, I am not satisfied that the proposed 5-degree horizon mask, as applied across the full extent of the designation area, meets that test.

192. In particular, I consider that extending the horizon mask across the Industrial 4 (Awarua) Zone goes beyond what is reasonably necessary to protect the ongoing operation of the ground station. The information provided indicates that, even without applying the horizon mask to the Industrial 4 Zone, the requiring authority would still achieve a meaningful level of protection for the ground station through the remaining horizon mask controls over the surrounding Rural Zone and through the EMI protections.
193. Accordingly, I consider that the proposed extent of the horizon mask does not appropriately balance the operational requirements of the ground station against the significant adverse effects on land specifically identified for industrial development. A modified designation excluding the Industrial 4 Zone would, in my view, better achieve that balance while still enabling the requiring authority to achieve its core objectives.

6.7 Any Other Matter – Section 171(1)(d)

194. Section 171(1)(d) provides for the consideration of any other matters considered reasonably necessary by the territorial authority in order to make a recommendation on the requirement.
195. The requiring authority has provided an assessment against ICC District Plan Objective IND4Z-O7 in section 14.1 of the NoR under 'Other Matters'. This objective relates to reverse sensitivity and has been considered above in Section 6.4 of this report.
196. Several submitters seek greater clarity around the approval pathway when the designation conditions are breached by a landowner. For example, in their submission the Southland Business Chamber requests provision of a timely and transparent approval pathway for activities that may intersect with the designation, including fixed response timeframes, reasons for decisions, and independent review or dispute-resolution mechanisms where agreement cannot be reached. In terms of the approval process, I note that under s176 of the RMA, once land is designated, the landowner cannot do anything that would prevent or hinder the designated work without the requiring authority's consent. The landowner can still use the land in other ways, provided those activities do not interfere with the purpose of the designation.
197. If a landowner seeks to exceed the height limit imposed by the horizon mask condition (or exceed the EMI restriction), then the approval of SpaceOps would be required under s176(1)(b). However, the RMA itself does not prescribe a detailed application process, timeframes, notification requirements, or decision criteria for that approval. I am not aware of any other examples where a designation sets out the approval process within the designation itself, however, I consider that it would be appropriate for the requiring authority to provide information in the form of a condition in this instance, if the NoR is approved. For example: *"For any development proposal or activity on land within the designated area which breaches the conditions of this designation, the property owner must apply for written approval from the requiring authority under section 176(1)(b) of the RMA. No written approval is required for any development proposal or activity that complies with the conditions of the designation"*.
198. Aside from the above, there are no other matters which are considered necessary to consider in order to make a recommendation on the NoR.

6.8 Designation Lapse Period Extension – Section 184(1)(c)

199. Section 184 of the RMA states that designations lapse within five years, if not given effect to, or an extension has been obtained under Section 184(1)(b), or unless the designation in the Plan sets a different lapse period under Section 184(1)(c).
200. No lapse period is necessary, due to the restrictive nature of the designation. No physical works need to be undertaken in order to give effect to the designation.

7 Part 2 of the Resource Management Act 1991

7.1 Section 5 of the RMA

201. The purpose of the RMA is set out in Section 5(1) which is: to promote the sustainable management of natural and physical resources.
202. Sustainable management is defined in Section 5(2) as:
- ...managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while –*
- (a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
- (b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*
- (c) avoiding, remedying, or mitigating any adverse effects of activities on the environment.*
203. An assessment under section 5 is provided by the applicant in Section 14.2 of the NoR, which also takes into consideration Sections 6, 7 and 8 of the RMA. The NoR considers that because of the restrictive nature of the designation, there are no adverse effects on Section 5 or 6 matters, there is no specific matter within Section 7 that is relevant, and that the proposal is consistent with Section 8 (Treaty of Waitangi).
204. I agree that the proposal is consistent with Section 8, and that there are no relevant matters of national importance in Section 6. I take a different view in regards to Section 5 and Section 7. The RMA defines 'natural and physical resources' as "land, water, air, soil, minerals, and energy, all forms of plants and animals (whether native to New Zealand or introduced), and all structures". Therefore, I consider the area of land covered by the proposed designation, and the ground station infrastructure to be 'natural and physical resources'. The proposed designation would impose significant restrictions on the use and development of the Industrial 4 Zone, and would limit its future development potential. This area of land was specifically zoned to accommodate future industrial development, and I consider that, while it would enable the ground station to operate, the proposed horizon mask would not enable people and communities to provide for their economic wellbeing, and would not sustain the potential of this land resource to meet the reasonably foreseeable needs of future generations. Imposing the proposed horizon mask on the Industrial 4 Zone is not considered to be wholly consistent with Section 5 or 7(b) of the RMA.

8 Recommendation and Conditions

8.1 Recommendation

205. It is recommended that the proposed electromagnetic restriction aspect of the NoR is appropriate and should be confirmed, subject to conditions.
206. Subject to new or contrary evidence being presented at the hearing, it is recommended that the horizon mask aspect of the NoR is modified to exclude the Industrial 4 (Awarua) Zone from the horizon mask limitation area.
207. I also recommend that the proposed conditions are amended to reflect the modification to the NoR, and to incorporate the recommendations of the engineering review. The recommended conditions are set out in Section 8.2 of this report, below.
208. Pursuant to Section 171(3) of the RMA the reasons for the recommendation are as follows:
- (a) The EMI component of the proposed NoR is considered to be appropriate and should be confirmed. Subject to the recommended amendments to the conditions, the restriction is consistent with Part 2 of the RMA, the relevant National Policy Statements, the SRPS and the ICC District Plan. The amended

conditions appropriately recognise and reinforce the protections already established through the RSM Decision and radiocommunications legislation, while avoiding unnecessary constraints on surrounding land uses. The designation will provide greater certainty regarding the ongoing operation of the Awarua satellite ground station and will ensure that existing radiocommunication protection requirements are more readily identified and understood by plan users and affected landowners.

- (b) Confirming the horizon mask protection over the surrounding Rural Zone is considered to be appropriate, as the effects are limited in extent and generally consistent with the zoning framework. The adjacent rural properties most affected by the height limit are large landholdings, and only a small area immediately adjoining the ground station would be subject to more restrictive height controls than the ICC District Plan. The proposal will not materially affect the ongoing productive use and development of rural land, while providing protection for the operational requirements of the Awarua satellite ground station.
- (c) It is considered that the proposed extent of the horizon mask goes beyond what is required to appropriately balance the operational needs of the ground station against the effects on surrounding land. In particular, including the Industrial 4 (Awarua) Zone within the horizon mask restriction area will have significant adverse effects on land specifically intended for industrial development. The horizon mask component of the proposed NoR should be modified to exclude the Industrial 4 (Awarua) Zone. While I accept that maintaining a low horizon is an important operational requirement of the Awarua satellite ground station and that some form of airspace protection is reasonably necessary, I consider that the proposed 5 degree horizon mask would impose significant restrictions on land that has been specifically zoned for industrial development. The assessment of effects has identified that the horizon mask would introduce height restrictions which would constrain development opportunities, reduce investment certainty, and undermine the strategic purpose of the zone. The resulting adverse economic effects on the Industrial 4 Zone are considered to outweigh the benefits of applying the horizon mask. Applying the horizon mask over the Industrial 4 Zone would not be wholly consistent with the relevant provisions of Part 2 of the RMA, or the ICC District Plan, (in relation to the Industrial 4 (Awarua) Zone provisions). The engineering review has also identified that further assessment of specific operational requirements and directional sensitivities of the ground station would be appropriate, and that it may not be necessary to apply the horizon mask in all directions.

8.2 Recommended Conditions

209. The recommended designation to appear in the ICC District Plan and recommended conditions are set out below.

Requiring Authority:

Space Operations New Zealand Limited

Purpose:

Horizon Mask Airspace Limitation Surface and Electromagnetic Interference Limitation Area

Locality:

Land and airspace within a 2km and 3km radius of 721 and 781 Colyer Road, Invercargill

Legal Description:

Various

Conditions:

Yes

Conditions:

1. *The Electromagnetic Interference Limitation Surface covers the following land and airspace:*
 - a. *All land and airspace within a 2km radius as measured from any point of the boundary of Designation 97, Awarua Satellite Ground Station and Ancillary Operations (Lot 1 DP 483454, Lot 1 DP 524692, and Lot 2 DP 524692) as it relates to Electromagnetic Interference from terrestrial services.*
 - b. *All land within the coastal marine area, and public conservation land, is not included within the Electromagnetic Interference Limitation Surface designation.*
 - c. *The extent of the designation is shown on the plan entitled "[updated plan reference to be inserted]"*.
2. *Within the Electromagnetic Interference Limitation Area shown on the Designation Plan, no new individual terrestrial radiocommunication service (established after [insert date of designation confirmation]) shall produce electromagnetic emissions greater than -154 dBW/MHz at frequencies used for the reception of radio signals from spacecraft at the Awarua Satellite Ground Station, as identified in the Table of Radio Spectrum Usage in New Zealand (PIB 21), Issue 11 (June 2021), published by the Ministry of Business, Innovation and Employment, or any subsequent replacement or amendment.*
 - a. *For the purposes of this condition, a terrestrial radiocommunication service means a service involving the transmission, emission and/or reception of radio waves for specific telecommunication purposes, other than any radiocommunication involving the use of one or more space stations, or the use of one or more reflecting satellites or other objects in space. This includes, but is not limited to:*
 - i. *radio and television broadcasting services;*
 - ii. *cellular mobile networks and their base stations;*
 - iii. *fixed wireless access and wireless broadband services;*
 - iv. *point-to-point and point-to-multipoint microwave links;*
 - v. *land mobile radio systems, including private and business radio, trunked radio and paging services;*
 - vi. *radio telemetry, SCADA and other remote monitoring or control radio systems;*
 - vii. *maritime and aeronautical mobile radio services;*
 - viii. *radionavigation and radiolocation services, including radar; and*
 - ix. *amateur radio services.**It does not include equipment that produces radiofrequency emissions only as an incidental by-product of its operation and not for telecommunication purposes.*

Where any doubt or need for clarification arises as to whether a particular service is a terrestrial radiocommunication service, reference should be made to Sections I and III of Article 1 of the ITU-R Radio Regulations.

- b. *For the avoidance of doubt, this condition does not apply to buildings, structures, electrical infrastructure or electrical equipment that do not constitute, or include as a component, a terrestrial service, including (without limitation) wind turbines, solar panels, generators, transformers, substations, inverters, switchgear, battery storage systems or other*

electrical equipment that generate only incidental electromagnetic emissions as a by-product of their operation.

- c. This condition does not apply to electromagnetic emissions from terrestrial services which are located outside the Electromagnetic Interference Limitation Area.*
- 3. The Horizon Mask Airspace Limitation Surface covers the following airspace:*
 - a. All airspace within the Rural Zone above a 'horizon mask' as measured from the boundary of Designation 97, Awarua Satellite Ground Station and Ancillary Operations (Lot 1 DP 483454, Lot 1 DP 524692, and Lot 2 DP 524692). The horizon mask will be measured from a height of 2m at the boundary of Designation 97, extending out at an angle of 5 degrees, for a distance of 3km.*
- 4. New buildings or structures, or extensions of buildings or structures, or vegetation that penetrate the Horizon Mask Airspace Limitation Surface shall be prohibited except where:*
 - a. The party on whose land the building, structure or vegetation is located (or who is otherwise responsible for the building, structure or vegetation), has received written approval from Space Operations New Zealand Limited for the penetration, under section 176(1)(b) of the Resource Management Act.*
- 5. For any development proposal or activity on land or airspace within the designated area which breaches the conditions of this designation, the property owner must apply for written approval from the requiring authority (Space Operations New Zealand Limited) under section 176(1)(b) of the Resource Management Act. No written approval is required for any development proposal or activity that complies with the conditions of the designation.*

Advice Notes:

- 1. To calculate the height limit imposed by the horizon mask at specified distances from the boundary of Designation 97, a calculation can be made as follows:*

$$\text{Maximum height} = 2 + d \times \tan(5^\circ)$$

Where d = the horizontal distance from the site boundary (in metres) and $\tan(5^\circ) = 0.08749$

The following table indicates the height limit which is imposed by the horizon mask at different distances within the 3km radius:

<i>Distance from Boundary</i>	<i>Maximum height</i>
<i>100m</i>	<i>10.7m</i>
<i>250m</i>	<i>23.9m</i>
<i>500m</i>	<i>45.7m</i>
<i>1000m</i>	<i>89.5m</i>
<i>2000m</i>	<i>176.9m</i>
<i>3000m</i>	<i>264.5m</i>

APPENDIX 1: SUMMARY OF SUBMISSIONS

Submission Number	Name	Support/Oppose/Neutral	Key Issues	Relief Sought
1	George Rankin	Neutral	Submitter owns Lots 28 and 29 at 1506 Bluff Highway, and land is currently forestry use (30 years). Submitter may consider future wind turbine use. Notes that current forestry use is not impacted by the new designation as it is below the horizon mask.	No amendments required.
2	Marc and Amy Jarvis	Oppose	Submitters are concerned about the restrictions from the horizon mask and electromagnetic interference area extending over their land. Concerned that future development would be limited, land value reduced, and the land rendered incapable of reasonable use. Therefore, the land should be acquired under the Public Works Act.	That the notice of requirement be withdrawn.
3	Adam Fuller	Oppose	Concerned that proposed Condition 2 is unclear on how written approval would be considered for future development breaching the limitation surface. Considers that the limitation surface is overly restrictive and could be used to exclude any object. States that radio waves propagate, not along an exact "line of sight", but through a volume which can be up to tens of metres in diameter. Therefore structures, if slender enough or of high enough permittivity, could be designed to have a negligible effect on the applicants signals.	Amend proposed Condition 2 to require the applicant to consider details from developers about future built form seeking to breach the limitation surface, and allow developers the opportunity to gain approval where theory and/or testing shows the object would not materially interfere with the applicant's signals.
4	South Port Attention: Shannon Jennings	Oppose	Opposes the designation as it is considered overly broad and insufficiently justified, and likely to impose significant constraints on strategically important land, infrastructure, and future development within the Awarua industrial area. The proposed "horizon mask" and associated controls would restrict the height and nature of development within a wide surrounding area, limiting the ability to undertake activities consistent with industrial zoning and intended land use. This conflicts with established planning intent and reduces the functional capability of industrially zoned land. Concerned that the proposed designation may adversely affect fundamental infrastructure necessary to support port, logistics and industrial activity, such as cranes and lifting equipment, large-scale storage and warehousing structures, electrification and	Decline the notice of requirement in its current form.

Submission Number	Name	Support/Oppose/Neutral	Key Issues	Relief Sought
			energy infrastructure; and expansion of industrial and logistics facilities. This has the potential to reduce operational efficiency and constrain future capacity. Notes that projects proposed in the Awarua area include renewable generation, battery storage, and supporting electrical infrastructure. The proposed designation has the potential to constrain wind and solar generation development battery storage installations, electrical plant, transmission, and distribution infrastructure; and construction activities necessary to establish such assets. South Port considers that any restriction on energy development may have wider implications for both existing industries and the attraction of future investment. Concern regarding adverse effects on investment certainty and economic growth, noting that major industrial and infrastructure developments require long-term certainty regarding land use and regulatory settings. The introduction of a broad overlay, particularly one involving discretionary approvals and uncertain thresholds, risks discouraging investment and delaying development. The potential economic opportunity cost, including forgone employment, regional investment, and industrial growth, has not been adequately assessed. Concern regarding the creation of a private approval mechanism which will introduce delay and uncertainty into development processes, create commercial risk for investors and infrastructure providers; and lacks transparency. There has been insufficient assessment of alternative sites, configurations, or operational solutions, and it has not been demonstrated that the extent of the proposed designation represents the minimum necessary to achieve the stated outcome. The broader effects on industrial development, infrastructure provision, and regional economic outcomes have not been comprehensively assessed. Notes procedural concerns regarding separation of the two NoRs, and processing delays.	
5	Herman Thys	Oppose	The submitter is opposed in principle to limitations being placed on their land, by their neighbours. Concerned that limitations will affect the property value.	Reject the request for designation, respect the rights of adjoining landowners and existing landholdings and plans, and assess future

Submission Number	Name	Support/Oppose/Neutral	Key Issues	Relief Sought
			Submitter uses virtual fencing, and are planning on implementing solar and/or wind energy generation. Concerned that the restrictions might prevent adaptation to new technology, or from becoming more sustainable with limitations on power generation.	development on a case-by-case basis, with Space Operations NZ to provide financial support, alternatives, or compensation for missed opportunities and land devaluation if restrictions are imposed.
6	Stewart Family Assets C/- Lane Neave Lawyers Attention: Joshua Leckie and Hayley Mahon	Oppose	Opposed to the entirety of the Notice of Requirement, including the height restriction (or “horizon mask”) on any built form on the Stewart Family Assets Land, and the electromagnetic interference limitation area being placed on the Stewart Family Assets Land. The NoR would directly conflict with the anticipated planning and legal environment, noting the Industrial 4 Zone anticipates large-scale industrial development and was introduced into the District Plan to address Invercargill’s long term industrial needs. The effects on the environment of the NoR are inappropriate. The horizon mask will restrict the height of buildings and structures, which in the Industrial 4 zone are provided for as a controlled activity up to 35m, and restricted discretionary above 35m. Submitter has lodged a consent for a windfarm, which would be unable to proceed without SpaceOps’ permission. Additionally, other ancillary structures to industrial activity such as cranes and chimney stacks would not be able to proceed without Space Ops’ permission. This limitation on height undermines the integrity of and is contrary to the purpose of the Zone. The electromagnetic interference restriction would affect the use or development of many anticipated and necessary elements of industrial businesses such as: a. heavy electrical machinery with large currents, switching or motors; b. high voltage transformers, substations, welding equipment and battery charging systems; c. manufacturing and processing plants with induction heating lines; and d. generators, energy generation facilities including solar panels, power transformers and inverters. Such a restriction is inappropriate.	That Council should recommend the withdrawal of the Notice of Requirement accordingly.

Submission Number	Name	Support/Oppose/Neutral	Key Issues	Relief Sought
			The NoR would render the Stewart Family Assets Land incapable of reasonable use, and should be acquired under the Public Works Act 1981. The application for the NoR is deficient and does not adequately assess alternative sites, methods or effects on the submitters land. The NoR will not promote the sustainable management of resources and is contrary to Part 2 of the Act. Concern regarding procedural issues including the separate processing of the NoR and the Land-based NoR, the time delays in processing and Space Ops' requiring authority status.	
7	Southland Business Chamber Attention: Sheree Carey CEO	Neutral	Supports both Space Operations NZ and the Awarua Quadrant development, recognising each as strategically important to Southland's economy, innovation, and long-term resilience. The Chamber's submission is not about choosing one project over the other. It is about ensuring the planning framework allows both to operate, grow and contribute to Southland's future economy. The Chamber's concern is that the Notice of Requirement may create uncertainty or impediments for future industrial and renewable-energy development in the Awarua area if it is not carefully managed. The Chamber therefore seeks a negotiated, practical and technically robust outcome that gives confidence to both SpaceOps and current or future investors in Awarua Quadrant. If the Notice of Requirement is perceived as creating unresolved conflict, uncertainty or unnecessary restrictions over Awarua Quadrant, it may discourage investment. That would be contrary to Southland's wider economic-development interests. The Chamber considers heavy-industrial zoned land, renewable generation, battery storage and energy infrastructure to be strategic regional assets critical for Southland's future economy. Any designation conditions should therefore be carefully designed so they protect SpaceOps' operational requirements without unnecessarily constraining renewable generation, energy storage,	That Invercargill City Council takes consideration to: 1) Encourage and facilitate a negotiated outcome between SpaceOps and affected parties, including Calder Stewart, to ensure that SpaceOps and Awarua Quadrant can both operate and grow successfully. 2) Ensure any confirmed designation is no broader than necessary to protect the operational requirements of the Awarua Satellite Ground Station. 3) Require clear, objective and technically based conditions so affected landowners, developers and investors understand what activities are permitted, what activities require approval, and how approval decisions will be made. 4) Provide a timely and transparent approval pathway for activities that may intersect with the designation, including fixed

Submission Number	Name	Support/Oppose/Neutral	Key Issues	Relief Sought
			heavy-industrial activity or infrastructure that supports regional growth. Supports a negotiated outcome that aims to protect the operational needs of the Awarua Satellite Ground Station, preserve development certainty for Awarua Quadrant, provide clear, objective and technically based pathways for future development, avoid unnecessary delay or uncertainty for investors, support Southland's broader economic-development objectives, and maintain confidence in the region as a place to invest. Considers a win-win solution should be possible if the conditions, approval, processes and technical assessment pathways are clear and proportionate. Potential conflicts should be carefully and transparently managed, given the relationships between ICC, Great South and SpaceOps.	response timeframes, reasons for decisions, and independent review or dispute-resolution mechanisms where agreement cannot be reached. 5) Recognise the regional importance of heavy-industrial development, renewable electricity generation, battery storage and energy infrastructure in the Awarua area. 6) Ensure the Notice of Requirement does not unnecessarily constrain regionally significant industrial and energy development, where any effects on SpaceOps can be avoided, remedied or mitigated. 7) Use independent technical advice to assess the interaction between the proposed designation and potential industrial, renewable-energy and infrastructure activities. 8) Manage actual, potential and perceived conflicts transparently, including consideration of independent accredited commissioners or other independent process safeguards. 9) Support a planning outcome that maintains investor confidence in both SpaceOps and Awarua Quadrant, and supports Southland's wider economic diversification.
8	Environment Southland Attention Shana Lee, Team Leader Policy	Neutral	Environment Southland (ES) is currently processing a resource consent application by Stewart Family Assets, a neighbouring property owner, which concerns part of the wider area affected by the proposed designation. ES note that the current resource	Confirms that position is neutral and that Environment Southland does not wish to be heard, unless further information arises during the process

Submission Number	Name	Support/Oppose/Neutral	Key Issues	Relief Sought
			consent process under the Resource Management Act is separate to the current Notice of Requirement. More broadly, ES considers that the proposed designation does not appear to significantly affect matters for which the Council has responsibility under section 30 of the Resource Management Act 1991. In particular, the Notice of Requirement does not raise issues that would materially impact the Council's regional functions.	that would indicate implications for the discharge of the Council's regional council functions.
9 (Late submission)	Invercargill City Council, Water Services Group Attention Alistair Snow	Neutral	Considers the effects of the NoR by SpaceOps may place restrictions on activities that council is undertaking in the Awarua area. The effects will be to radio frequency emissions by switch - mode power supplies, motor controllers, inverters and other industrial devices. The Water Services Group is undertaking a water supply investigation in the Awarua Area. The investigations to date have sourced an aquifer through the installation of several wells. The existing wells are in the vicinity of Awarua Siding Road and Colyer's Road and within the restrictions of the Airspace and Electromagnetic Limitation Surface boundaries identified. On-going investigations require additional wells to be installed to the southeast of Space Operations NZ properties. The investigations and any on-going production pumping will require power supply via a new 11 KV network, motor controllers and inverters to pump and treat the water. Variable speed drives produce electromagnetic noise generally in the range of 2 - 20kHz, and cable emissions < 100MHz and although it is unlikely to affect the radio signals as explained within the NoR, Council reserves its right to not be restricted as the scope of the water supply development is yet to be determined. Powernet will be upgrading the Awarua Siding Road 11KV network to support power distribution to Space Operations NZ and the water supply investigations. The airspace limitation will prevent the overhead cabling of the network past the SpaceOps site. Request SpaceOps accommodate the undergrounding or relocation of the power network if the NoR is implemented.	Seeks that Council consider the existing infrastructure use (Community Supply) and for its rights to remain unrestricted with regards to the NoR, and if required SpaceOps to accommodate and cover costs of upgrading / installing infrastructure to meet the NoR criteria.

APPENDIX 2: ENGINEERING REVIEW – ADDITIONAL MEMO

Comments on Space Ops response

I have reviewed the applicant's response to Council Engineering Peer Review, dated 7 August 2026 and make the following comments and recommendations:

1. The response goes somewhat towards addressing issues raised in my report, however, continues to show lack of understanding of how the Radiocommunications Act of 1989, Radio Regulations of 2001 and ITU regulations work. Due to this their response continues to claim protection that is not offered to them. There is no mention in Condition 3(a) of services that were existing before the RSM Decision came into effect that could produce interference in this band. I recommend that condition 3(a) is amended so that the restriction applies to new terrestrial services, established after the RSM Decision came into effect, or after the designation is approved (if granted).
2. Condition 3(b) of the response defines a terrestrial service as "a radiocommunication service operating between points on or near the Earth's surface that intentionally transmits or receives radiofrequency signals". Under this definition satellite earth stations would be captured, which are not terrestrial services. Sections I and III of Article 1 of the ITU-R Radio Regulations, taken together, define what a terrestrial service is. Terrestrial service is a well understood concept in regulatory circles. However, if a definition has to be included, I propose the following:

A terrestrial radiocommunication service means a service involving the transmission, emission and/or reception of radio waves for specific telecommunication purposes, other than any radiocommunication involving the use of one or more space stations, or the use of one or more reflecting satellites or other objects in space.

This includes, but is not limited to:

- radio and television broadcasting services;
 - cellular mobile networks and their base stations;
 - fixed wireless access and wireless broadband services;
 - point-to-point and point-to-multipoint microwave links;
 - land mobile radio systems, including private and business radio, trunked radio and paging services;
 - radio telemetry, SCADA and other remote monitoring or control radio systems;
 - maritime and aeronautical mobile radio services;
 - radionavigation and radiolocation services, including radar; and
 - amateur radio services.
-

It does not include equipment that produces radiofrequency emissions only as an incidental by-product of its operation and not for telecommunication purposes.

Where any doubt or need for clarification arises as to whether a particular service is a terrestrial radiocommunication service, reference should be made to Sections I and III of Article 1 of the ITU-R Radio Regulations.

3. Regarding the protection provided, I have only commented based on what has been provided by the various Acts, Regulations etc that only deal with electromagnetic transmission. Physical obstruction is not governed by this framework, and the horizon mask proposed is not within my subject area. However, I can confirm that physical obstruction will interfere with the reception of electromagnetic signals, especially at such low levels. Whether a particular structure causes obstruction depends on its azimuth, elevation, distance, size and construction, and on the elevation angles and directions the station actually relies on. A uniform envelope applied in all directions does not reflect this, and I would expect a station supporting polar-orbiting spacecraft to have directional sensitivities rather than uniform ones. A case-by-case assessment against the station's actual operating requirements would be better matched to the effect.
 4. Cumulative Interference (point 4). A radio engineer issuing a licence will follow the requirements of the Act and the Regulations, which do not provide for cumulative interference to be considered. If the designation requires cumulative interference to be taken into account, a practical difficulty arises: the information needed to estimate it is not obtainable, as the relevant out-of-band and spurious performance is held by the individual licensees and is not recorded in the licence register. The result may be that the protection the designation appears to offer does not follow through in practice, because of the disconnect between the two regimes. I raise this for completeness. I note that the applicant's response states that condition 3 applies to each individual activity, but this is not clear in the condition. I recommend that condition 3(a) is clarified to refer to individual terrestrial services.
 5. A related point to the one above. The -154 dBW/MHz figure is a level to be met within the protection area, not a restriction on where transmitters may be sited. A designation reaches only land inside the 2 km area, so a service established outside it is uncontrolled regardless of the level it produces inside — potential background interference I identified comes from Bluff and Invercargill, 8–11 km out. I recommend that condition 3(a) is amended so that the restriction applies to individual terrestrial services within the 2km area only and does not apply cumulatively or to existing interference generated outside the area.
 6. I also note an error in para 35 of my report. Para 35 states that there is no protection from Dawn Space licenses. My statement that there is no protection
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from Space Operations licences remains correct. Protection is available in respect of the Aero Mobile transmitter, which is a terrestrial service. However, the transmission is intermittent and it would be difficult to establish that any interference came from the aircraft, so in practice that protection may be limited. This has no material impact on the matters discussed above.



Dr A Sathyendran

27 August 2026
