Air Quality Management Options

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1. Introduction

1.1. Purpose

1. This report provides options for air quality management in Otago, for discussion at the ESP Committee Workshop on 20 February 2025. The purpose of the workshop is to seek clarification about Council's level of ambition for managing Otago's air quality issues:
    - What are the outcomes Councillors want to see for air quality? What are the trade-offs ORC is willing to make?
    - Where should the priorities lie? For example: health and wellbeing, compliance with guidelines, cost effectiveness?
    - What time frames should ORC be looking at to achieve these outcomes?
2. Based on feedback received from Committee members at the workshop, staff will prepare a paper for the 19 March 2025 Council meeting to confirm the preferred approach.
3. Council's decision about which of the available options to pursue and the level of ambition for addressing air quality in Otago will determine the course for drafting the upcoming Air Regional Plan and Air Quality Strategy. ORC cannot design the best approach for air management until we know what we need to achieve and by when.
4. Council's decision about the desired level of ambition will likely be influenced by:
    - Central government direction, provided through the RMA and NESAQ;
    - Council/community aspirations, communicated through the Strategic Directions, pORPS 2021, and 2024 community and stakeholder engagement feedback;
    - Kāi Tahu values and aspirations;
    - Scientific data about the state of Otago's air and efficacy of possible approaches;
    - Competing demand for limited resources;
    - Relative financial costs to ORC, homeowners, and our communities.
5. At the workshop, staff will present this report, which describes various levels of ambition that Council could pursue, based on the current planning context and data about air quality in Otago. The options analysis covers the air quality improvements and other benefits that those levels of ambition could achieve, as well as indicative costs. Feedback will be sought from ESP Committee members.
6. This report is structured as follows:
    - **Part 1:** Introduction and purpose.
    - **Part 2:** A description of the operating context, including legislation, Council's other existing commitments, iwi partnership, and the approaches taken by other Councils.
    - **Part 3:** A description of the roles of the Air Quality Strategy and non-regulatory tools.
    - **Part 4:** Potential management options for ambient air quality issues and localised effects.

7. A report on community and stakeholder feedback received through engagement is attached to this report.

8. Background information about assumptions and health costs for ambient air management is provided in the attached memorandum entitled Summary of Air Quality Management Options.

1.2. Background

9. In 2023, ORC staff began a review of our approach to managing air quality issues in Otago, with the aim of producing an Air Quality Strategy and Air Plan. The process to date has included input from Council at the following workshops and meetings:

    - Workshop 13 September 2023: Staff presented the scientific data we have on air quality and sought Council's input on issues in Otago.
    - ESP Committee Workshop and Meeting on December 13, 2023: The ESP Committee considered a high-level Issues and Options paper and confirmed the list of issues for engagement.
    - ESP Committee Workshop 27 June 2024: The Science Team provided a briefing on the most up to date air quality science for Otago.
    - Council Meeting 23 October 2024: Staff updated Council on progress for developing an Air Quality Strategy and Air Plan, including key future milestone points. Council approved establishing a Councillor Reference Group, noted ORC's joint approach to the strategy and plan, and approved the Terms of Reference for the Reference Group.

10. Staff also undertook public and stakeholder engagement throughout July – September 2024, and continue to liaise with Kāi Tahu, agencies, and key stakeholders to refine and explore policy options and non-regulatory approaches.

11. A draft Air Plan will be presented to Council in August 2025 for consideration and a decision on public notification. The draft Air Quality Strategy will be presented at the same time, for endorsement prior to public engagement. An overview timeline of the process is provided as Appendix 3.

1.3. The Strategy and the Plan

12. The Air Quality Strategy will connect ORC's Strategic Directions to ORC's operational functions. It will articulate ORC's level of ambition for air quality management, and the approaches that ORC will take to achieve this ambition.

13. The Strategy will comprise three distinct components:

    - THE WHY: ORC's ambition i.e: what air quality outcomes ORC intends to achieve and by when;
    - THE HOW: The approach that ORC will take to achieve this ambition. This is the combination of regulatory and non-regulatory methods ('tools in the box') that ORC will adopt to manage the region's air quality issues.

- THE WHAT: Who will do what and by when.

14. The Strategy will also need to articulate any trade-offs that ORC may be making in pursuit of the ambition.

15. The Air Plan is one of the key 'tools in the box' required to achieve the ambition of the Strategy. Other 'tools' that ORC has used in the past include monitoring, research, education, advocacy, enforcement, and financial incentives.

1.4. A Note on Airsheds

16. This document does not address the configuration of Otago's airsheds. Analysis to date suggests Otago's current airsheds need to be reviewed. However, this is a complex topic that requires further in-depth discussion. Staff will address these needs with Council soon at a dedicated workshop likely to be in early March. The Airshed review should not affect progress of the Plan and Strategy.

2. Context

17. This section gives a brief summary of the context – a more fulsome description is provided in the appendices.

2.1. Legislation and Other Direction

18. The Resource Management Act 1991 (RMA) makes the ORC responsible for controlling discharges to air, to achieve sustainable management of Otago's resources. The National Environmental Standards for Air Quality (NESAQ) are regulations under the RMA that provide more specific direction on air quality – a set of standards for air quality management and concentration limits for certain contaminants of concern (Table 1).

Table 1: NESAQ Schedule 1 Ambient air quality standards for contaminants

Contaminant	Threshold concentration	Number of exceedances allowed
Carbon monoxide	10 milligrams per cubic metre expressed as a running 8-hour mean	1 in a 12-month period
Nitrogen dioxide	200 micrograms per cubic metre expressed as a 1-hour mean	9 in a 12-month period
Ozone	150 micrograms per cubic metre expressed as a 1-hour mean	None
PM10	50 micrograms per cubic metre expressed as a 24-hour mean	1 in a 12-month period
Sulphur dioxide	350 micrograms per cubic metre expressed as a 1-hour mean	9 in a 12-month period
	570 micrograms per cubic metre expressed as a 1-hour mean	None

19. The National Policy Statement for Greenhouse Gas Emissions from Industrial Heat Process 2023 (NPSGGE) give specific instruction for policies around industrial process heat production, with specific requirements for regional air plans.

20. Kāi Tahu has set out the iwi's issues, objectives, and policies for air management in iwi management plans – Te Tangi a Tauira 2008, and Kāi Tahu ki Otago Natural Resources Management Plan 2005. Under the RMA, ORC must take these plans into account.

21. ORC has further specified its own position on air quality management, in the context of the above framework, through the RPS 2019, pORPS 2021 (currently under appeal) and its Strategic Directions 2024-2034. These documents create a clear direction towards partnership with Kāi Tahu, holistic environmental management, and driving compliance with the contaminant limits set out in the NESAQ.

2.2. Iwi Partnership

22. Both the pORPS 2021 and the Strategic Directions set a clear path for partnership with Kāi Tahu in resource management.

23. ORC staff have fortnightly meetings with staff from Aukaha and Te Ao Marama Inc. (TAMI) to keep them abreast of the process and developments in policy and strategy options for air quality management. In December 2024, Aukaha and TAMI were provided with a draft document outlining ORC staff thinking on potential ambient air quality management options.

24. Feedback through these meetings and positions set out in the iwi management plans align in many respects with ORC positions outlined in the Regional Policy Statement and Strategic Directions 2024-2034. They describe a holistic focus on wellbeing and intergenerational sustainability, as well as specific issues to do with meaningful involvement in decision making and management (for example, through cultural assessments of discharges).

25. Kāi Tahu also have more specific concerns around effects on cultural values, such as visibility of cultural landscapes, positioning crematoria to ensure emissions do not impact mahika kai, wāhi tapu, and other taoka, and wider implications for impacts on flora, fauna, and landscapes.

26. In accordance with existing direction from Council, ORC staff are continuing to work alongside Aukaha and TAMI staff, sharing thinking and progress as the process develops and intend to do so throughout drafting of the Plan and Strategy. There is a formal process for Rūnaka to provide feedback on the draft proposed plan under the RMA, schedule 1, clause 4A, which must be completed prior to notification. Staff anticipate also providing the draft Strategy for Rūnaka to review throughout the drafting process, and during clause 3 consultation, though there is no set legislative process for this.

2.3. ORC Strategic Directions 2024 – 2034

27. The Strategic Directions articulate the Council's vision for Otago: *Our environment and communities are healthy and connected ki uta ki tai (from the mountains to the sea).*

28. It puts forward six areas for ORC to focus on over the life of the Strategic Directions. These are also the Community Outcomes that ORC's 2024 – 2034 Long Term Plan aims to deliver.

29. Beneath each focus are various goals; those of which that are particularly pertinent for the Strategy and Plan are:

    Ecosystems are healthy, our water and air are clean, and biodiversity loss is arrested across the region.

    We predict and address emerging environmental issues before they arise.

    Our regional plans are effective at ensuring our resources are managed sustainably within biophysical limits in a planned and considered way.

Carbon emissions are reduced and air quality is improved across the region, supported by our efficient and affordable public transport services.

2.4. World Health Organization (WHO) Air Quality Guidelines 2021

30. The WHO frames clean air as a basic human right. It regularly collects scientific evidence on air pollution's health impacts as well as monitors countries air quality progress. The WHO released updated guidelines in 2021 based on international best evidence. The suggested limits (see Table 2) are more stringent than the limits set in the NESAQ, in particular for Otago's key pollutant: particulate matter.

Table 2: World Health Organization limits for PM10 and PM2.5 compared to NESAQ limits for PM10

Pollutant	Averaging Time	NESAQ 2004		WHO 2021	
		Value (µg/m³)	Allowable exceedances	Value (µg/m³)	Allowable exceedances
PM_{10}	24-hour	50	1 per year	45	3-4[b]
	Annual	20[a]	NA	15	NA
$PM_{2.5}$	24-hour			15	3-4[b]
	Annual			5	NA

2.5. Other Councils' Approaches

31. Some other Regional Councils have updated their Air Plans within the last 10 years. Through review and discussion with colleagues nationally, staff have identified four Councils whose Air Plans and wider air quality management frameworks provide a good yardstick for ORC's development process. These are our neighbours Environment Canterbury and Environment Southland, and two other councils who have made good progress in managing domestic heating: Nelson City Council and Environment Bay of Plenty. A summary of the approaches taken at these councils is provided in Appendix 2.

3. Approaches to Air Quality Management

32. The Air Quality Strategy will connect national and regional priorities, set through legislation, plans and strategic directions, to ORC's operational functions. It will articulate ORC's level of ambition for air quality, and the approaches that ORC will take to achieve this ambition.

33. These approaches will form the toolbox of regulatory and non-regulatory methods that ORC will adopt to manage each of the region's air quality issues. The Air Plan will be a key tool, along with non-regulatory tools.

34. Regulatory approaches are discussed elsewhere in this report, but a summary of some common non-regulatory tools in use around New Zealand is given below, covering:

    - Financial incentives
    - Certification schemes
    - Behaviour change programmes
    - Advocacy
    - Partnership and Collaboration

35. Staff have not yet undertaken a detailed funding needs analysis to determine how each of the tools could be funded (i.e., general rates, targeted rates, or a combination). As the tools are further refined, this will be undertaken with the Finance Team.

3.1. Financial Incentives

3.1.1. Why Use this Tool

36. Previous experience in Otago and anecdotal evidence from research, other Councils, and community organisations suggests that financial incentives are a key tool for ensuring successful transitions to low-emission burners. Where older burners are being phased out through regulation, it incentivises people to upgrade to a compliant burner and enables them to do so when they might not have the funds readily available.

3.1.2. Considerations for Delivery

37. There may be options to implement financial assistance in collaboration with partners in this space, for instance territorial authorities. ORC could also partner with other agencies including Aukaha, the Dunedin Housing Alliance (Previously Cozy Homes), and the Energy Efficiency and Conservation Authority (EECA). Note that these agencies have a focus on human health outcomes and/or energy efficiency rather than regulatory compliance and air quality limits.

38. A potential approach would be to offer a subsidy to contribute towards the cost of replacing an older burner with a less emissions-intensive alternative (such as an ULEB or heat pump) in a certain towns. Depending on its priorities, Council may wish to broaden the ambit of funding as well - for example, contributing towards to cost of improving

the thermal envelope of a house (e.g. through better insulation) as this decreases the reliance on heating appliances and improves health outcomes.

3.1.3. Resourcing and Costs

39. Any level of assistance represents a cost to Council, and therefore ratepayers. ORC has previously provided subsidies for replacing woodburners as part of the Clean Heat, Clean Air programme, with funding from a variety of sources, including a targeted rate. The proportion of Council versus homeowner contributions varied over time. The targeted rates ceased to be collected over 15 years ago, and no funds remain.

40. If Council sees financial assistance as a viable tool, it will have further choices to make such as how to fund this, and deciding who will have access to it, and how much and what to fund. For example, eligibility for financial assistance could be based on financial means testing, which focusses support on those most in need. However, administration of such testing bears its own costs. Depending on Council's desired assistance package, further staff resourcing (FTE) may be required to manage this. A partnership arrangement (e.g. with Dunedin Housing Alliance) might be one way to reduce administration costs to ORC if such a scheme was favoured.

3.2. Certification schemes

3.2.1. Why Use this Tool

41. ORC can consider certifying retailers that provide services and goods supporting good air quality. For example, a scheme for certifying firewood retailers for providing dry wood and directing consumers to those providers, improves the quality of fuel people use in their woodburners. Burning dry wood rather than wet significantly reduces particulate matter output from any burner.

42. Dry firewood certifcation schemes exist in Southland, Canterbury, and Nelson, and conversations with these councils indicate that the schemes are working well.

3.2.2. Considerations for Delivery

43. Certifications would need to be validated and kept up to date, with a clear and simple process for merchants to obtain and keep certification.

44. Certified firewood retailers would need to be accessible and comparatively costed to other retailers. Many people, especially in more rural areas, access firewood from private sellers or for free.

45. Schemes of this sort need to be part of a broader scheme of community awareness and education, along with clear regulatory requirements about fuel use, in order to be fully effective. Retailers would likely need some incentive to be a part of the programme, regulatory or otherwise.

3.2.3. Resourcing and Costs

46. Depending on the final structure, ORC may lack the capacity to deliver such a programme within existing staff resources. In that case, work would need to be reprioritised or additional FTE resources employed.

3.3. Behaviour Change Programmes

3.3.1. Why Use this Tool

47. Behaviour change programmes can take various forms, and often incorporate a regulatory compliance component. Their goal is to increase knowledge in the community about policy goals and the reasons for them, and increase behaviours that support those goals, increasing community buy-in and expertise. Behaviour change programmes encompass a range of approaches that vary in their level of intervention, including:

    - Advice programmes, promoting information about air quality and making it readily available, for example, proper fuel use or outdoor burning best practices and alternative waste programmes. The current "Burn Dry, Breathe Easy" campaign used in Otago is an example.
    - Holding or attending community events for information sharing or providing in-house assessments for how to improve home heating.
    - Using complaints to focus education efforts.
    - Smokey Chimney programmes - targetting homes with smokey chimneys for delivering advice about fuel and burner use, and raising options for assistance if appropriate. This has been successfully used at other Councils, including ECan and Nelson, to target high polluting homes. This is in line with ORC's Compliance Team's approach of emphasising education first.
    - Community led practice guidelines – for example, collaborating with the rural community to develop guideines for outdoor burning practices.

3.3.2. Considerations for Delivery

48. Providing advice and education is within current ORC work programmes, and this could be adapted/extended to provide more advice and education on air quality-related matters.

49. More active modes such as smokey chimney checks could be carried out by Compliance Officers or Catchment Advisors. However, there is merit in partnering with other agencies for this work. Other Councils have found that community members can be more receptive to third-party people than council Compliance Officers.

50. Programmes such as these are likely to require cross-council involvement for development of expertise, procedures, resources (such as educational materials) and communications.

3.3.3. Resourcing and Costs

51. Costs for these programmes could vary widely depending on the level of intervention proposed. Some dedicated FTE may be required for programme management, but given the seasonal nature of this work, it may be possible to accomodate delivery within the workloads of existing teams. This has not been explored at this stage.

52. There will be costs to ORC inherent in developing resources.

3.4. Advocacy

3.4.1. Why Use this Tool

53. Given its central role in resource management, ORC is in a position to advocate to companies and agencies whose activities may influence ORC's ability to achieve its strategic and legislative goals and requirements. In the air context, such agencies may include:

- Government Ministers and Ministries,
- Ministry of the Environment (MFE),
- Energy generation and transmission companies,
- Large industry bodies.

3.4.2. Considerations for Delivery

54. ORC already does a lot of this work (e.g. through submissions on Central Government reforms), though there may be opportunity to become more focussed and deliberate about advocacy on air issues.

3.4.3. Resourcing and Costs

55. This work is unlikely to generate significant additional cost.

3.5. Partnerships and Collaboration

3.5.1. Why Use this Tool

56. Partnering with territorial authorities (TAs), stakeholders, community organisations, and Kāi Tahu to deliver programmes is an effective way to build relationships, share lessons, and build buy-in to achieve ORC's vision for air quality. It can also be a more effective way to deliver some programmes in the face of public distrust of regulators (for example, the smoky chimney check programme described above).

3.5.2. Considerations for Delivery

57. ORC has several existing networks that could be called on for partnership in the area of air quality management. Community engagement has suggested that there are also businesses and community organisations with expertise in related fields who would make good partners in this area – for example chimney cleaning companies and burner retailers. ORC also has prior successful experience partnering with organisations such as Cozy Homes Trust, now the Dunedin Housing Alliance, for delivering subsidies for warmer homes.

3.5.3. Resourcing and Costs

58. Resourcing would be very dependent on the partnership model. It may require additional FTE for programme management at ORC. Funding to partner agencies may also be required.

4. Air Quality Management Options

59. The key activities which require ORC intervention to manage adverse effects under the Air Quality Strategy and Air Plan are:

- Home heating
- Outdoor burning (included alongside Home Heating options, but also as a separate topic)
- Farming
- Agrichemicals and fertilizer
- Industrial and Trade
- Vehicle Emissions

60. These topics are discussed below, with management options presented. ORC's Policy and Planning, Science, and Strategy Teams have worked collaboratively to identify these options in response to issues raised in the issues and options paper presented to Council in December 2023, and public and stakeholder engagement conducted through July – September 2024.

61. Direction is sought from ESP members, as to the level of ambition they would like to set overall, and for each activity.

4.1. Home Heating

62. Home heating using solid fuel burners is the single largest source of particulate matter (PM) in Otago's air. PM is linked to significant morbidity[1,] in New Zealand, and several of Otago's towns exceed limits for good health.[2,3] Outdoor burning also contributes to PM concentrations, though monitoring cannot easily quantify outdoor burning's impact on any given airshed.

4.1.1.1. NESAQ Rules for Home Heating

63. In 2005, the Ministry for the Environment (MfE) introduced rules for wood burners on properties less than 2 hectares. The rules are contained in sections 22, 23 and 24 of the

[1] Kuschel et al (2022). Health and air pollution in New Zealand 2016 (HAPINZ 3.0): Volume 1 – Finding and implications. Report prepared by G Kuschel, J Metcalfe, S Sridhar, P Davy, K Hastings, K Mason, T Denne, J Berentson-Shaw, S Bell, S Hales, J Atkinson and A Woodward for Ministry for the Environment, Ministry of Health, Te Manatū Waka Ministry of Transport and Waka Kotahi NZ Transport Agency, March 2022.

[2] Wilton, E. (2023) Air Quality Management in Otago Environet Ltd.

[3] Harrison, S. (2024) State of the Environment report: Air quality trends 2005 – 2023 Otago Regional Council, Dunedin.

NESAQ. The rules prohibit any wood burners installed after 1 September 2005 on properties less than 2 hectares in size which do not meet the following requirements: emissions of less than 1.5g/kg of dry wood burnt and a thermal efficiency of not less than 65 per cent.

64. Open fires, multi-fuel burners, pellet burners and wood-burning cooking stoves are not included in the definition of wood burner so are not covered by the wood burner standards. However, the NESAQ (section 24A) prohibits discharges from open fires in polluted airsheds.

65. Section 28 of the NESAQ states that if a rule, resource consent, or bylaw is more stringent than the NESAQ, the rule, resource consent, or bylaw prevails. However, if the plan is less stringent than the NESAQ, the NESAQ regulations prevail.

66. These rules under the NESAQ will continue to apply across Otago, regardless of the new Air Plan regulations.

4.1.2. Option 1: Status Quo

67. ORC's current management framework is largely based on the Air Plan and associated monitoring and compliance activities. Management for ambient air quality is based on Air Zones – management areas that overlap with but do not fully match the gazetted air sheds. Rules for the air zones vary in stringency – with the strictest requirements for burner emissions in Air Zone 1. Non-regulatory activities are largely limited to the Burn Dry, Breathe Easy campaign, which is a communications and advice campaign targeted at improving domestic burning practices, especially in winter months.

68. The Air Plan was developed before the NESAQ came into effect in 2004. While the Plan has been updated over the years to incorporate some aspects of the NESAQ, there are some areas covered by the NESAQ that are not addressed in the Air Plan, or are inconsistent, and in these cases the NESAQ rules prevail.

4.1.2.1. Current Air Plan Rules for Home Heating

69. The provisions for the current Air Plan were developed prior to 1998 and updated in 2007[4] to give effect to the NESAQ, before ultra-low emission burners (ULEBs) were commonplace. Instead of referring to any specific type of burner, the Air Plan refers to

[4] Plan Change 2 (National Environmental Standards) notified 2007, operative 2009.

particulate emission rates and thermal efficiency – two measurements which contribute to contaminant concentrations (air pollution).

70. The Air Plan rules mimic the NESAQ regulations described above, however there are some rules which are less stringent that the NESAQ rules, so the NESAQ rules prevail.

71. Unlike other Air Plan rules, under which consent may be granted for discretionary activities, the rules for domestic heating are largely either permitted[5], or prohibited. Alexandra, Arrowtown and Cromwell (along with Clyde) were recognised to have air quality issues, and so have the most stringent provisions, requiring any burners installed after 2007 to have a particulate emission rate of 0.7 g/kg or less, and a thermal efficiency of not less than 65% to be permitted. ORC's website recommends homeowners install a ULEB to meet these requirements, however there are some non-ULEB models which also meet these requirements.

72. In other urban areas[6] NESAQ rules apply if the burner is installed on a property less than 2 hectares in size, and after 2007 any burner installed must have a particulate emission rate of 1.5 g/kg or less, and a thermal efficiency of not less than 65% to be permitted.

73. The rest of Otago refers to any area of Otago which is not one of the named urban centres. In the rest of Otago, discharges from cookers are permitted[7], and NESAQ rules apply to any property smaller than 2 hectares.

74. Domestic heating appliances in recognised heritage buildings and in commercial premises may be allowed through a discretionary consent.

75. Table 3 lists the regulatory requirements in each location.

[5] Rules 16.3.1.2 to 16.3.1.7

[6] Balclutha, Central Dunedin, Green Island, Hawea, Kingston, Milton, Mosgiel, Naseby, North Dunedin, Oamaru, Palmerston, Port Chalmers, Queenstown, Ranfurly, Roxburgh, South Dunedin, Waikouaiti, and Wanaka

[7] An exemption is made for cookers as ambient air quality is generally high and it is important for these smaller communities or isolated smaller properties to be able to be self-sufficient for heating and cooking as it may take longer to restore power in the event of a break to supply.

Table 3: Permitted burner requirements under the current air plan and the NESAQ

Air Zone	**1**	**1**	**2**	**3**
Date of installation	**Alexandra, Arrowtown Cromwell**	**Clyde**	**Urban centres[8]**	**Rest of Otago**
After 2005 (NESAQ rules)	Burners installed on properties less than 2 hectares in size must have emissions of less than 1.5 g/kg and a thermal efficiency of not less than 65%.			
Before 2007	Burners with a particulate emission rate of less than 1.5 g/kg are permitted.		NESAQ rules apply. Excepting NESAQ rules, any burner is permitted.	NESAQ rules apply. Excepting NESAQ rules, any burner is permitted. Cookers are permitted.
After 2007	Burners with a particulate emission rate of 0.7 g/kg or less, and a thermal efficiency of not less than 65% are permitted.		Burners with a particulate emission rate of less than 1.5 g/kg and a thermal efficiency of not less than 65% are permitted.	NESAQ rules apply. Any burner on a property larger than 2 hectares is permitted. Cookers are permitted.
Before 2009		Burners with a particulate emission rate of less than 1.5 g/kg are permitted.		
After 2009		Burners with a particulate emission rate of 0.7 g/kg or less, and a thermal efficiency of not less than 65% are permitted.		

[8] Balclutha, Central Dunedin, Green Island, Hawea, Kingston, Milton, Mosgiel, Naseby, North Dunedin, Oamaru, Palmerston, Port Chalmers, Queenstown, Ranfurly, Roxburgh, South Dunedin, Waikouaiti, and Wanaka.

76. Continuing with the current management for air quality will gradually result in overall improvements in air quality of 18%[9] but will not meet the limits set out in either the NESAQ or the WHO by 2040[10]. The total health cost of the status quo management framework is estimated to be at around $106 million for monitored airsheds, and $431 million for other urban areas.[11].

77. The current rules are difficult for customers and other territorial authorities to understand and use. A flow chart was created to assist customers understand the regulatory requirements (see appendices).

4.1.3. Option 2 – Achieving the National Environmental Standards for Air Quality

78. Option 2 (NESAQ) prioritises the outcome of regulatory compliance, although it would also improve health outcomes from current levels and reduce associated health costs.

79. Monitored towns which are currently known to have more than 1 permitted exceedance (Alexandra, Arrowtown, Cromwell, Clyde, Milton and Mosgiel) would need to improve ambient air quality. For some other towns, further monitoring would be required to ascertain the scale of the issue (if any) before significant interventions are pursued. Air quality would at least need to be maintained in those towns in the meantime.

80. New rules in the Air Plan would require owners of domestic burners to upgrade to a ULEB or other low-emitting heating method (e.g., heat-pump) within 20 years in Alexandra, Arrowtown, Cromwell, Clyde, Milton and Mosgiel to achieve NESAQ compliance. For this large-scale upgrade to be successful, some financial assistance for replacing non-compliant burners would be desirable. Additionally, winter restrictions on outdoor burning (and associated outdoor burning education) would need to be introduced in a buffer area surrounding these towns in order to meet the NESAQ limits.

81. In Alexandra in particular, a behaviour change programme would assist with reducing discharges from burners.

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[9] See: Memo: Air Quality Management Options (Harrison, 2025)

[10] 2040 was chosen as an indicative date on which to base the modelling, due to the useful life of a burner being 15 years.

[11] All costs are per year, and are discussed in greater detail in Memo: Air Quality Management Option (Harrison, 2025)

82. All other towns in Otago could continue using their existing burners. However, to ensure that ambient air quality is maintained, any new burners would need to be ULEBs. Under this option, there would be no subsidies or education programmes for other urban areas.

83. The actions for Option 2 (NESAQ compliance) are summarised in Table 4 below.

Table 4: Option 2 (NESAQ) actions

	Alexandra	**Arrowtown, Clyde Cromwell, Milton and Mosgiel**	**All other urban areas**
Regulatory	20-year phase out of non-ULEB. Only ULEB for new installs. Winter burning restrictions (outdoor burning).	20-year phase out of non-ULEB. Only ULEB for new installs. Winter burning restrictions (outdoor burning).	Only ULEB for new installs.
Non-regulatory	Financial assistance for replacing non-ULEB. Behaviour change programmes.	Financial assistance for replacing non-ULEB.	None.

84. The outcomes for Option 2 are:

- Air quality: Average improvement in PM2.5 concentrations of 42%, annual PM2.5 averages meet WHO guideline of 5 µg/m³ in Arrowtown and Mosgiel, and come within 0.5 µg/m³ in Clyde and Milton. 24-hour PM10 averages meet NESAQ compliance in all airsheds.
- Health: A modelled 31% reduction in adverse health impacts with cost savings of $33 million in monitored airsheds and $18.9 million in other urban areas compared to the status quo.

4.1.4. Option 3 – Achieving the World Health Organization Guidelines

85. Option 3 (WHO) requires a phase out over 20 years of all types of burners in Alexandra. This is the only way to meet WHO guidelines in Alexandra.

86. In Arrowtown, Cromwell, Clyde, Milton and Mosgiel, it would require a phase out of all non-ULEB burners (preferably with financial assistance), over 20 years. Additionally, in Alexandra, Clyde and Cromwell winter burning restrictions and a behaviour change programme would be required.

87. All other towns in Otago could continue using their existing burners, however, to maintain ambient air quality, any new burners would need to be ULEBs.

88. The actions for Option 3 (achieving WHO guidelines) are summarised in Table 5 below.

Table 5: Option 3 (WHO) actions

	Alexandra	**Cromwell, Clyde**	**Arrowtown, Milton, Mosgiel**	**All other urban areas**

Regulatory	20-year phase out of all burners.	20-year phase out of non-ULEB. Winter burning restrictions (outdoor burning).	20-year phase out of non-ULEB.	Only ULEB for new installs.
Non-regulatory	Financial assistance for replacing all burners.	Financial assistance for replacing non-ULEB. Behaviour change programmes.	Financial assistance for replacing non-ULEB.	None.

89. The outcomes for Option 3 are:

- Air quality: Compliance with annual WHO guideline for $PM_{2.5}$ in monitored airsheds. Improvements in other towns and/or prevention of degradation.
- Health: 45% reduction in adverse health impacts of particulate pollution with cost savings estimated at $48 million in monitored airsheds and $18.9 million in other urban areas compared to the status quo.

4.1.5. Options Analysis

90. This section has identified three options for home heating:

- **Option 1:** Status quo, which does not meet NESAQ limits or WHO guidelines by 2040.
- **Option 2:** Aims to achieve the air concentration limits for PM10 set out in the NESAQ by 2040. This will also result in a reduction of PM2.5.
- **Option 3:** Aims to achieve the air concentration limits for PM2.5 set out in the WHO guidelines by 2040.

91. Option 2 (NESAQ) prioritises the outcome of regulatory compliance, although it will also improve health outcomes from current levels and reduce associated health costs. There will be an increased cost to ORC and members of the public.

92. Option 3 (WHO) prioritises health outcomes. It will go beyond the PM reductions required for NESAQ compliance. It will have improved health outcomes over Option 1, with a correspondingly greater reduction in associated health costs, and greater costs to ORC and members of the public.

93. Options 2 and 3 will result in improvement in air quality, and health cost savings compared to the status quo (see Table 6). The air quality improvements and health costs are based on modelling which was undertaken in monitored airsheds: Alexandra, Arrowtown, Clyde, Cromwell, Milton and Mosgiel[12].

Table 6: Proposed ambient air quality options - outcomes at 2040

Outcome	Option 1: Status quo	Option 2: NESAQ	Option 3: WHO
Improvement in PM2.5 concentrations in monitored airsheds	Average improvement in PM2.5 concentrations of 18% by 2040.	Average improvement in PM2.5 concentrations of 42% by 2040.	Average improvement in PM2.5 concentrations of 49% by 2040.
	WHO not met by 2040.	Annual PM2.5 averages meet WHO guideline of 5 µg/m³ in Arrowtown and Mosgiel, come within 0.5 µg/m³ in Clyde and Milton, and within 1.5 µg/m³ in Alexandra and Cromwell.	Annual PM2.5 averages in all town meet WHO guideline of 5 µg/m³.
Improvement in PM10 concentrations in monitored airsheds.	NESAQ not met by 2040.	24-hour PM10 averages meet NESAQ compliance in all airsheds by 2040.	Compliance with NESAQ in all airsheds by 2040.
Health outcomes in monitored airsheds		Total health cost of $73 million Health cost savings of $33 million	Total health cost of $58 million Health cost savings of $48 million

94. The health cost savings are calculated relative to the status quo (i.e. current Air Plan framework). The total health costs of the status quo will be approximately $106 million per year by 2040.

95. Both Option 2 and Option 3 will deliver on their respective outcomes through a combination of regulatory and non-regulatory tools. The combination of tools in each option is informed by the scientific analysis of their expected impact on air quality for

[12] There is no regular air quality monitoring undertaken in any other urban centres in Otago. Due to the way the airsheds are currently gazetted, these other urban centres are represented by Arrowtown, Mosgiel and Dunedin.

each specified place. The options are discussed in more detail below and summarised in the appendices.

96. There are several supporting initiatives that require consideration regardless of the option chosen. These include, for example, non-regulatory and regulatory support for proper fuel use (burning dry wood only, banning coal use), the use of bylaws to support removal of non-compliant burners, and the extent and nature of any financial aid included under each option. These actions are presented as potential building blocks of the options, while recognising that the detail for their implementation requires deeper consideration and analysis than is feasible in this paper.

97. The year 2040 has been used in the air quality modelling to reflect the useful burner life of 15 years from notification of the plan (2025). However, after air quality modelling was completed, phase out timeframes of 20 years from the date of notification were chosen to better reflect practical considerations of burner life expectancy, spreading out subsidy cost to Council, or simply giving communities a large enough window of time in which to make their burner compliant. Adjusting the timeframes of either option would affect its cost and efficacy – generally, a longer timeframe for implementation will reduce health benefits (thereby increasing health costs) and reduce cost per year for implementation.

98. Table 7 identifies and assesses the benefits and cost implications anticipated from implementing each option. Note that estimates for cost implications are discussed further below.

Table 7: Options analysis - benefits and costs

	BENEFITS	**ISSUES**
Option 1 – Status Quo	Lowest cost to ORC Lowest cost to individuals who can retain their existing burners	Human health costs Continuing NESAQ exceedances Economic, social and cultural costs – poor air quality can affect outdoor and community events By continuing to permit pollutants from home heating, airsheds will remain polluted, and this results in less opportunities for trade and industrial or commercial activities to be consented under the NESAQ.
Option 2 - NESAQ	Will bring PM emissions below NESAQ limits by 2040 Will reduce respiratory and cardio-vascular illness and premature death due to emissions. Retaining availability of burners (various types allowed in various towns) provides resilience against energy insecurity and lower cost options for heating. Having burners (various types allowed in	WHO limits will not be met in all towns, meaning higher risk to human health. Cost to Council in providing subsidies and education. Cost to homeowners to upgrade their heating device after 20 years use. Solid fuel appliance manufacturers that do not sell ULEB burners may lose potential income. Cost associated with regulatory functions if

	various towns) available as an option to all homes in Otago ensures warm, dry homes are possible.	ORC increases compliance, enforcement, as well as other measures such as education **Total cost of providing subsidies for replacing existing burners with ULEBs/heat pumps/or equivalent other estimated to be up to $55,584,000 (see below).**
Option 3 - WHO	Best air quality outcomes– leads to all Otago airsheds meeting WHO and NESAQ limits. Will reduce respiratory and cardio-vascular illness and premature death due to emissions.	Banning burners in Alexandra is likely to: • Attract substantial public opposition for both practical and emotional reasons, • Undermine heating security in an electricity outage, • Increase heating costs due to high electricity prices, • Lead to more cold homes, due to the above and the lack of efficiency or operability of heat-pumps at low temperatures. • Severely impact burner and firewood retailers (likely removing the former) Cost to Council in providing subsidies and education. The health benefits of air quality improvements may not be realised if they come at the expense of household warmth. **Total cost of providing subsidies for replacing existing burners with ULEBs/heat pumps/or equivalent other estimated to be up to = $55,800,000 (see below).**

4.1.5.1. Subsidies

99. When subsidies for wood burner replacements were made available by ORC previously, the funding came from a variety of sources. At one point ORC collected a targeted rate for certain towns and this went into the Clean Heat Clean Air reserve to help homeowners with replacing burners. The proportion of Council versus homeowner contributions varied over time. The targeted rates ceased to be collected over 15 years ago, and gradually the fund was depleted.

100. Other Councils in New Zealand are offering subsidies of around $6,000 per household to contribute towards the cost of replacing a non-compliant burner with a ULEB (or other very low/no emissions heating device). From recent discussions with the region's territorial authorities and research into the cost of ULEBs, $6,000 could cover the majority of the costs to the homeowner for the appliance, the installation work, and the cost of the building consent. The burner and installation costs can vary widely, however,

depending on the model chosen and the work that needs to be done to install it. Building consent costs also vary considerably across Otago's territorial authorities and depend on an application's complexity and completeness.

101. Table 8 provides an estimate for the total cost of providing $6,000 subsides for replacing all existing solid wood burners with ULEBs (or other compliant heating appliances) in the target towns. Neither territorial authorities nor ORC hold reliable information on the distribution of solid fuel burners in Otago, and so numbers of burners in this report are based on data from Infometrics. This data does not distinguish existing ULEB burners from other burners, so the numbers of burners in need of replacement is likely overestimated. Community feedback (see the attached report) was that 31% of people who burn wood in a solid fuel burner had a ULEB, though it is not clear if this is representative of the population at large.

Table 8: Options analysis - estimated cost of providing $6,000 subsidies for solid fuel burner replacement

Where	What (Infometrics)	How much? @$6000 subsidy per replacement
Alexandra	1200 wood burners 6 coal burners	$7,236,000
Cromwell	2106 wood burners 30 coal burners	$12,816,000
Clyde	327 wood burners 0 coal burners	$1,962,000
Arrowtown	1350 wood burners 15 coal burners	$8,190,000
Milton	534 wood burners 48 coal burners	$3,492,000
Mosgiel	3429 wood burners 219 coal burners	$21,888,000
		$55,584,000

102. Option 3 (WHO) would include replacing an additional 36 pellet fires in Alexandra, thereby costing a total of $55,800,000.

103. Should ORC choose to provide the subsidies, then a decision would need to be made over what timeframe this is offered e.g. 10 years to encourage early adoption well before burners become non-compliant.

4.1.6. Using an Air Quality Bylaw to Support the Air Plan Rules

104. Regional councils cannot control domestic heating appliances installed in a home – they can only control the discharge. This can result in burners and open fireplaces remaining

installed in homes despite being non-compliant. An air quality bylaw is an arrangement between a regional council and a district council, whereby the city/district council delegates powers to administer and enforce the bylaw to the regional council. The regional council then has powers to enter homes to check if the burner or fireplace is compliant. Additionally, the city/district council would only issue a building consent if the burner met the requirements of the bylaw.

105. The air quality bylaw would have clear, enforceable rules, which would align with the Air Plan rules.

106. ORC staff have discussed bylaw use with Bay of Plenty Regional Council (BoPRC) staff. In addition to its Air Plan rules, BoPRC uses a bylaw approach in its Rotorua air shed, with the bylaw developed and managed by BoPRC staff, under delegated authority from the Rotorua City Council. The Rotorua Air Quality bylaw includes 3 rules:

- From 2010 only approved wood burners can be installed
- From 2012 properties cannot be sold with non-compliant burners
- From 2015, open fires cannot be used.

107. BoPRC staff have found the bylaw effective for the following reasons:

- Bylaw rules can be enforced at point of sale. This means the real estate agents will inform a vendor if their burner is non-compliant, and the house cannot be sold until the burner is either removed or replaced/upgraded (depending on the bylaw rules).
- Bylaw rules can manage burning appliances directly by regulating the type of burner installed or removed, whereas Air Plan rules can only regulate the discharge to air.
- A bylaw allows council officers to enter homes to check if the burner is compliant.
- Bylaws are faster to implement than plans, meaning that air quality goals could be achieved sooner, contributing to better health outcomes.
- Under a point-of-sale bylaw, there is the possibility that upgrades would be done sooner than under a date in a plan, due to ongoing real estate turnover, and the enforced need to upgrade.

108. The costs or disadvantages of this approach are:

- Council resources (staff time).
- Need to work closely with the TAs to design and implement a bylaw. The approach will fail if the TA is not willing or able to facilitate this approach.

109. Council could choose to work with Otago's territorial authorities in polluted airsheds with the aim of creating an air quality bylaw after the Air Plan is notified, which would be a very effective method of implementing burner upgrades, where required.

4.2. Outdoor Burning

110. Outdoor burning involves the burning of materials in open air and covers both small- and large-scale activities. It is largely undertaken for the purposes of waste disposal, disease control, and land clearance. Outdoor burning is a source of particulate matter

emissions and, depending on the material burned, it can also result in discharges of odour, ash/soot and noxious or dangerous gases.

111. Compared to home heating, outdoor burning has a much smaller influence on ambient air quality; it is estimated that in Otago, 6% of PM_{10} emissions are from outdoor burning within airsheds.[13] However, this estimate does not include emissions from outdoor burning that occurs outside airsheds, as these emissions are difficult to quantify,[14] so the actual contribution of outdoor burning to particulate matter pollution is likely to be greater. Nationally, outdoor burning is estimated to account for around 20% of particulate matter emissions.[15]

112. Outdoor burning can also have significant localised adverse effects, including on amenity. Outdoor burning was the most common source of air discharge complaints to ORC, making up 41% of the 625 complaints received between 1 January 2024 and 10 February 2025. Additionally, community feedback received during the 2024 engagement on air quality management suggests that outdoor burning is seen as one of the main sources of air pollution in Otago.

113. Under stable conditions, smoke plumes (and therefore particulate matter) from larger-scale outdoor burning can travel long distances. In Otago, smoke plumes have been identified more than 15 km from their source. This means that the adverse effects of outdoor burning can potentially extend over a large area, and the ambient air quality of urban areas can be affected by rural as well as urban outdoor burning. This is a particular issue for Alexandra, Clyde, Cromwell, Arrowtown, Mosgiel and Milton, as these urban areas already have poor air quality and are more likely to experience meteorological conditions that are conducive to minimal smoke dispersion.[16]

114. In summary, the management options for outdoor burning discussed in this section are:

    - Option 1 – Status quo.
    - Option 2 – Increased regulation. Four regulatory measures are suggested, and some or all of them could be used.
        - Option 2A – Urban outdoor burning restrictions. This option would improve ambient air quality and reduce localised adverse effects.

13 Otago Regional Council (2023) Air Plan: issues and options.

14 Wilton, E. (2023) Air quality management in Otago: an evaluation of management options to achieve air quality targets for PM10 and PM2.5 in Arrowtown, Clyde, Cromwell, Milton and Mosgiel.

15 Memorandum: Impacts of outdoor burning on urban areas in Otago. (Harrison, S. 2023).

16 Wilton, E. (2024) Air quality impacts of outdoor burning in the Otago Region.

- Option 2B – Winter outdoor burning restrictions, which would apply to a buffer zone around certain urban areas. This option would improve ambient air quality and reduce localised adverse effects.
- Option 2C – Ban agricultural wrap burning. This option would reduce localised adverse effects.
- Option 2D – Require good practice region wide, which would involve making good outdoor burning practices (e.g. setbacks) region-wide requirements. This option would reduce localised adverse effects.

- Option 3 – Non-regulatory approach, which would involve using non-regulatory measures to manage outdoor burning instead of rules.

4.2.1. Option 1 – Status Quo

115. The status quo for outdoor burning management is summarised in Table 9.

116. Under the current Air Plan, there are significant restrictions on outdoor burning in Air Zones 1 and 2, which mostly contain urban land. In these areas, outdoor burning is only permitted on residential properties if it is at least 50 m from the boundary, and to be permitted on non-residential properties it must be 100 m from the boundary. Effectively, this means that outdoor burning is not permitted on smaller urban properties (under 1 ha for residential properties, under 4 ha for non-residential properties). There are also restrictions on what material that can be burned; only dry organic material (excluding treated wood) sourced from the property where the outdoor burning will occur can be burned as a permitted activity.

117. Air Zone 3 is mostly rural land, but it also contains various small urban areas. On Air Zone 3 properties that are not production land, the same restrictions on what material can be burned apply, but there are no boundary setbacks. On production land in Air Zone 3, any material can be burned unless it is prohibited by rule 16.3.3.1[17]. There is an exemption for polyethylene in rule 16.3.3.1 allowing agricultural wrap (bale wrap, silage wrap) to be burned as a permitted activity.

[17] The materials prohibited by rule 16.3.3.1 are: chlorinated organic chemicals; contaminated material from contaminated sites and buildings; food waste; materials containing heavy metals; material associated with recovery of metal from coated or covered cables; motor vehicles and vehicle parts; materials containing mineral fibres including but not limited to asbestos; paint and other surface coatings; pathological materials excluding animal carcasses on production land; agrichemicals and agrichemical waste; plastic (not including polyethylene); tyres and other rubber timber treated with copper; chrome and arsenic or organochlorine preservatives; waste oil or other waste petroleum products; sewage sludge and associated solids or solids derived from liquid-borne municipal, industrial or trade waste; asphalt surfaces (seal burning).

118. On the non-regulatory side of outdoor burning management, schedule 5 of the current Air Plan encourages good management practices to prevent or minimise smoke from outdoor burning. Similar advice, along with information on alternatives to outdoor burning, are provided on the ORC website and have been included in brochures in the past.

Table 9. Status quo regulatory and non-regulatory measures.

	Air Zones 1 and 2	**Air Zone 3 (not production land)**	**Air Zone 3 (production land)**
Regulation	No burning of rule 16.3.3.1 materials. Only paper, cardboard, vegetative matter, untreated wood. Only dry material from the property where the burning will occur. Burning set back at least 50 m from residential property boundary. Burning set back at least 100 m from non-residential property boundary.	No burning of rule 16.3.3.1 materials. Only paper, cardboard, vegetative matter, untreated wood. Only dry material from the property where the burning will occur	No burning of rule 16.3.3.1 materials (burning of agricultural wrap permitted).
Non-regulatory	Guidance on outdoor burning best practice and alternatives to burning.		

4.2.2. Option 2 – Increased Regulation

119. Increased regulation is one way to manage outdoor burning in Otago differently. Option 2 covers four different regulatory measures for controlling outdoor burning emissions, and some of all of them could be used. These are summarised in Table 10 and are described in more detail below.

120. The regulatory measures that would improve ambient air quality as well as reduce localised adverse effects are year-round restrictions on urban outdoor burning and restrictions on outdoor burning outside urban areas over (Options 2A and 2B). These measures could be introduced to some or all of the urban areas with the poorest air quality (Alexandra, Arrowtown, Cromwell, Clyde, Milton and Mosgiel), as outlined in Section 4.1.

121. Non-regulatory measures such as community awareness and education programmes could be used to support regulatory changes.

Table 10. Options for increased regulation of outdoor burning.

	Urban outdoor burning restrictions (Option 2A)	**Winter outdoor burning restrictions (Option 2B)**	**Ban agricultural wrap burning (Option 2C)**	**Require best practice region wide (Option 2D)**
Regulation	Further restrict outdoor burning in urban areas, such as by setting a larger minimum site size or only permitted outside defined urban areas.	Establish buffer zones around urban areas where outdoor burning over winter requires resource consent.	Remove the exemption for polyethylene from rule 16.3.3.1— would have the effect of making outdoor burning of agricultural wrap a prohibited activity.	Make good practice for outdoor burning (e.g. setbacks, only burning dry material, only burning dry material) into permitted activity conditions that apply region-wide rather than just in Air Zones 1 and 2).

122. **Option 2A – Urban outdoor burning restrictions:** The current Air Plan rules mean that in most urban areas (Air Zones 1 and 2), outdoor burning is not permitted on properties smaller than 1 ha. However, all outdoor burning in urban areas affects ambient air quality, and even when it occur on larger properties it can have significant localised adverse effects. Potential controls on urban outdoor burning include setting a larger minimum site size or not permitting it within defined urban areas. Exemptions could be made for small-scale and/or infrequent outdoor burning activities that are permitted in the current Air Plan (e.g. campfires, celebratory fires, fires for cooking).

123. **Option 2B – Winter outdoor burning restrictions:** Outdoor burning typically has greater adverse effects in winter, when the stable conditions conducive to minimal dispersion of smoke are more common. Restrictions on rural outdoor burning over winter would reduce the amount of particulate matter travelling from nearby rural properties into urban areas. This option would involve establishing buffer zones around urban areas where resource consent would be required outdoor burning over winter (although exemptions would be necessary for activities such as burning diseased materials). There is also the possibility of using farm plans as an alternative pathway to resource consent.

124. **Option 2C** – **Ban agricultural wrap burning:** In general, the current Air Plan prohibits outdoor burning of plastic because of its noxious and dangerous discharges, but there is an exemption that allows agricultural wrap to be burned as a permitted activity in Air Zone 3. This was allowed historically due to a lack of feasible alternative disposal methods. However, agricultural wrap can now be recycled, and this is becoming standard practice across New Zealand. In Otago, Plasback runs a rural collection service

and there are some transfer stations that accept agricultural wrap for recycling. Banning agricultural wrap burning would involve removing the exemption that currently allows outdoor burning of polyethylene from rule 16.3.3.1, so that it is a prohibited activity.

125. **Option 2D – Require best practice region wide**: Measures such as boundary setbacks and only burning dry organic material are accepted as good practice when undertaking outdoor burning; they are listed in schedule 5 of the current Air Plan as good management practice to prevent or minimise the discharge of smoke. However, they are only set as permitted activity conditions in Air Zones 1 and 2. Extending these requirements across Otago would help to reduce the localised adverse effects of outdoor burning, especially at urban/rural interfaces.

4.2.3. Option 3 – Non-regulatory Approach

126. Options 1 and 2 primarily use regulation to reduce the impacts of outdoor burning on ambient air quality and its localised adverse effects. However, it is also possible to take a solely non-regulatory approach to achieving these outcomes.

127. This would involve significant investment into community awareness and education programmes focused on changing behaviour around urban outdoor burning, outdoor burning over winter, agricultural wrap burning and the use of best practice outside Air Zones 1 and 2. Amongst other things, this could involve collaborating with rural communities to develop region-wide guidelines for outdoor burning practices.

4.2.4. Options Analysis

128. Table 11 summarises the benefits of and issues with the outdoor burning management options identified in this section.

129. The status quo would be the lowest cost option for ORC (and therefore to ratepayers), and would not require individuals who do outdoor burning to change their practices or pay for alternative disposal methods. However, the status quo would not reduce the impact of outdoor burning on ambient air quality in urban areas where air quality is already poor (Alexandra, Clyde, Arrowtown, Cromwell, Milton and Mosgiel). There is a risk that this will undermine efforts to achieve ambient air quality limits in these areas, and having restrictions on home heating while the outdoor burning rules are very

permissive is a less equitable approach.[18] This equity issue was raised by some community members during the 2024 engagement on air quality management.

130. The current Air Plan's rationale for the more permissive rules in Air Zone 3 is that these areas often have a lower development density (and therefore fewer outdoor burning complaints are expected). However, the adverse effects of outdoor burning can extend kilometres from their source, so even in low density areas outdoor burning can have significant adverse effects.

131. The permissive rules for Air Zone 3 also mean that large scale outdoor burning can occur closer to roads and neighbouring dwellings than is best practice, and it can be a problem at urban/rural boundaries. For instance, burning a large pile of green vegetation is a permitted activity anywhere in Air Zone 3, even on a property that adjoins an urban area in Air Zone 1. Incorporating best practice into permitted activity conditions region wide (e.g. setbacks, only burning dry material) would help to reduce the localised adverse effects of outdoor burning.

132. Complaints data and community feedback received during the 2024 engagement on air quality management also suggest that the status quo is not adequately managing the localised adverse effects of outdoor burning.

Table 11. Benefits of and issues with outdoor burning management options.

	BENEFITS	**ISSUES**
Option 1 – Status quo	No additional internal resourcing or cost to ratepayers. No burden on individuals to change their current outdoor burning practices.	Does not adequately manage localised adverse effects of outdoor burning or its impacts on ambient air quality, particularly in Alexandra, Clyde, Arrowtown, Cromwell, Milton and Mosgiel. High numbers of outdoor burning complaints likely to continue, requiring resourcing from ORC. Complainants might lose faith in ORC in situations where the current rule framework allows activities with significant adverse effects as a permitted activity. Inequitable distribution of the air quality management burden between urban and rural residents.

[18] Wilton, E. (2024) Air quality impacts of outdoor burning in the Otago Region.

		Risk of undermining the air quality improvements resulting from more stringent home heating rules.
Option 2A – Increased regulation to improve ambient air quality	Improvements in ambient air quality and reduced localised adverse effects. Reduced outdoor burning complaints.	Additional financial and/or time cost for individuals who currently use outdoor burning for waste disposal (although this is a smaller burden for urban residents as they have kerbside collection or are closer to landfills/transfer stations) Compared to the status quo, requires more resourcing from ORC and therefore potentially cost to ratepayers.
Option 2B – Winter burning restrictions	Improvements in ambient air quality and reduced localised adverse effects Reduced outdoor burning complaints. More equitable distribution of the air quality management burden between urban and rural residents.	Compared to the status quo, requires more resourcing from ORC and therefore potentially cost to ratepayers. Burden on individuals to change their practices. Working around winter restrictions as well as fire seasons will require careful planning. Consent cost to individuals who apply for resource consent for outdoor burning over winter.
Option 2C – Ban burning agricultural wrap	Consistent with best practice of not burning plastic. Reduced localised adverse effects on amenity and health (avoiding the noxious and dangerous discharges from plastic burning).	Compared to the status quo, requires more resourcing from ORC and therefore cost to ratepayers. Burden on individuals to change their practices. Cost to individuals of paying for agricultural wrap recycling.
Option 2D – Require best practice region wide	Reduced nuisance effects—extended to all areas of Otago. Existing good practices – just making them rules. Reducing conflict between landowners already doing best practice vs those that aren't.	Compared to the status quo, requires more resourcing from ORC and therefore potentially cost to ratepayers. Burden on farmers if they aren't already doing good practice to change practices
Option 3 – Non regulatory approach	Potential to achieve the benefits of Option 2, but with more community buy-in.	Compared to the status quo, requires more resourcing from ORC and therefore potentially cost to ratepayers. Higher risk that improvements will not be achieved; no ability to compel individuals who refuse to change their behaviour.

4.3. Farming

133. In general terms, there are two types of farming activities that impact air quality: production and waste disposal. These activities do not release contaminants in quantities that can affect ambient air quality, but they can have localised adverse effects on amenity. Usually, these adverse effects are offensive or objectionable odours.

134. Territorial authorities play an important role in odour management, through land use zoning in district plans. This is the main mechanism for managing the locations of both the activities that discharge odours, and the sensitive activities or receivers. However, regional councils have the primary responsibility for managing air quality.

135. In summary, the management options for farming discussed in this section are:

- Option 1 – Updated status quo, which would involve incorporating setbacks for managing odour that are currently in other plans into a new Air Plan.
- Option 2 – Increased regulation of intensive farming (but not farm waste management).

4.3.1. Option 1 – Updated Status Quo

136. The current Air Plan contains rules on intensive farming and farm waste, and these rules apply region wide. Intensive farming is a permitted activity, provided no more than 2000 pigs or 100,000 poultry are kept at any one time.

137. Ponds, outdoor stockpiles of biological waste, and land application of biological waste are all permitted, provided they comply with boundary setbacks. Some setbacks for these activities that are intended to manage odour are contained in the Regional Plan: Waste and the proposed Land and Water Regional Plan, and should be incorporated into a new Air Plan.

4.3.2. Option 2 – Increased Regulation of Intensive Farming

138. The current Air Plan's permitted activity rule for intensive farming is more permissive than the rules in most other regional air plans. These typically either require resource consent for all intensive farming or have more restrictive permitted activity conditions such as lower stocking thresholds, setbacks or odour management plans. This appears to be a management gap that Otago's territorial authorities have filled through their district plans.

139. Increased regulation of intensive farming would involve making the current permitted activity rule more restrictive, rather than leaving this to district plans. It could involve requiring resource consent for all intensive farming or having more restrictive permitted activity conditions.

4.3.3. Options Analysis

140. No problems have been identified with the status quo for farm waste management as it relates to air quality, except the need to incorporate setbacks from other plans into the new Air Plan, which will not result in any change in management approach.

141. Complaints data suggests that odour from farming activities is not currently a significant problem in Otago. Additionally, adopting stricter rules in the new Air Plan would result in a temporary doubling up of consents between ORC and territorial authorities. However, it is ORC's responsibility to manage odour emissions, and without more

stringent regional rules, there is a risk that these emissions will not be adequately managed across the region (Table 12).

Table 12. Benefits of and issues with farming management options.

	BENEFITS	ISSUES
Option 1 – Status quo	Minimal additional internal resourcing and cost to ratepayers (there would be some cost involved in removing the setbacks from the other regional plans they are currently contained in). No burden on landowners to change practices. No doubling up of consents between ORC and territorial authorities.	Risk of odour from intensive farming not being adequately managed region wide due to reliance on district plans.
Option 2 – Increased regulation of intensive farming	More certainty that odour from intensive farming is adequately managed region wide.	Compared to the status quo, requires more resourcing from ORC and therefore potentially cost to ratepayers. Temporary doubling up of consents between ORC and territorial authorities, placing an additional cost on applicants.

4.4. Agrichemicals and Fertiliser

142. Spray drift/dust from agrichemical and fertiliser application to non-target areas can have localised adverse effects on properties and people. This can impact amenity values, vegetation (including crops) and human health.

143. The management options for agrichemical spray drift and fertiliser discussed in this section are:

- Option 1 – Status quo.
- Option 2 – Requiring best practice (improved consistency with the NZS 8409: 2021 Management of Agrichemicals).

4.4.1. Option 1 – Updated Status Quo

144. The agrichemical application rules in the current Air Plan are based on land use type: residential, production land and industrial/trade premises, and public places. There are minimal requirements for agrichemical application that is undertaken on private property, apart from general requirements to comply with manufacturer directions and avoid noxious or dangerous effects beyond the property boundary.

145. There are more requirements for agrichemical spraying in public amenity areas and places of public assembly. In these areas, compliance with a previous version of

NZS 8409 is required, along with specific requirements about qualifications, signage and notification.

146. In the current Air Plan, fertiliser application is addressed as parted of a rule permitting discharges from miscellaneous activities. This rule only requires that fertiliser application does not result in any offensive or objectionable discharges beyond the property boundary.

147. If the current rules are unchanged, the structure of the Air Plan could still be updated so that the rules for agrichemical and fertiliser application are grouped together. This would make the rules more user-friendly.

4.4.2. Option 2 – Requiring Best Practice

148. This option would involve organising the rules for agrichemical application rather than land use type. It would also involve requiring industry best practice for agrichemical application (compliance with NZS 8409:2021, appropriate qualifications, signage and notification) on private property as well as in public amenity areas and places of public assembly.

149. For fertiliser application, this option would involve including additional permitted activity conditions such as setbacks from neighbouring dwellings and certified organic properties (unless occupiers give written permission otherwise).

4.4.3. Options Analysis

150. Table 13 summarises the benefits of and issues with the agrichemical and fertiliser application management options identified in this section.

151. The risk of spray drift depends on a variety of factors such as application method, expertise of the operator and weather conditions, and application method—which affects the scale of the activity—is an important factor. The current Air Plan rules do to reflect this; they are instead based on land use type and do little to manage spray drift from agrichemical application on property. Option 2 seeks to address this by ensuring permitted activity conditions more accurately reflect industry best practice.

152. The only control on fertiliser application in the current Air Plan is the requirement to avoid an offensive or objectionable discharge beyond the property boundary. This is a more subjective requirement than a setback and does not specifically address the issue of fertiliser application near sensitive activities (e.g. neighbouring dwellings, organic farms).

Table 13. Benefits of and issues with agrichemical and fertiliser management options.

	BENEFITS	**ISSUES**
Option 1 – Status quo	Minimal increase in internal resources and cost to ratepayers. No burden on individuals to change their practices.	The rules may not adequately manage the localised adverse effects from agrichemical application on private property and fertiliser application.

	Grouping agrichemical and fertiliser application rules together would make the Air Plan more user-friendly.	
Option 2 – Requiring best practice	Grouping agrichemical and fertiliser application rules together would make the Air Plan more user-friendly. Improved consistency between the Air Plan and industry best practice. Reduced likelihood of localised adverse effects as a result of agrichemical application on private property or fertiliser application. Reduced complaints about agrichemical spraying and fertiliser drift.	Compared to the status quo, requires more resourcing from ORC and therefore potentially cost to ratepayers. Burden on individuals applying agrichemicals and fertilisers to change their practices (but only for users applying agrichemicals on private land who are not already complying with industry best practice).

4.5. Industrial and Trade

153. Industrial or trade premises means—

- any premises used for any industrial or trade purposes[19]; or
- any premises used for the storage, transfer, treatment, or disposal of waste materials or for other waste-management purposes, or used for composting organic materials; or
- any other premises from which a contaminant is discharged in connection with any industrial or trade process; —
- but does not include any production land.

154. The RMA requires that no person may discharge any contaminant from any *industrial or trade premises* into air unless the discharge is expressly allowed by an NES, a rule in a regional plan as well as a rule in a proposed regional plan for the same region (if there is one), or a resource consent.

[19] includes every part of a process from the receipt of raw material to the dispatch or use in another process or disposal of any product or waste material, and any intervening storage of the raw material, partly processed matter, or product.

4.5.1. Option 1 - Status Quo

155. The status quo rule framework for trade and industrial practices contains a number of permitted rules, and all other industrial and trade activities are captured with a discretionary consent requirement. The permitted activities are:

- Discharges from the processing of plant or animal matter,
- Discharges from sorting, crushing, screening, conveying and storage of powdered or bulk products,
- Discharges from mineral extraction and processing,
- Discharges from chemical processing, manufacturing and industrial or trade processes which discharge hazardous air contaminants,
- Discharges from metal processing and foundries,
- Discharges from surface coating (including spray painting) and di-isocyanate use,
- Discharges from petroleum and hydrocarbon processes,
- Discharges from the processing of wood and wood products.

156. All other activities which produce discharges to air from trade and industrial premises require a consent. The objectives and policies which guide the decision making on resource consents include:

- Objectives relating to ambient air quality, human health, cultural, heritage and amenity values, ecosystems,
- Policies to allow minor discharges and avoid discharges noxious, dangerous, offensive or objectionable discharges.

157. In addition to the Air Plan rules, the NESAQ requires that any discretionary consent application for an activity which produces PM10 in a polluted airshed must be declined unless other PM10 discharges are reduced (section 17).

4.5.2. Options Analysis

158. The status quo approach seems to be working well for Otago, based on advice from the consents team, therefore, no other options are presented at this stage.

Table 144: Benefits of and issues with the industrial and trade management option.

	BENEFITS	**ISSUES**
Option 1 – Status quo	High risk or polluting activities are managed through consents – providing environmental protections. Low risk activities are permitted, which supports economic and employment growth.	No known issues.

4.6. Vehicle Emissions

159. Vehicle emissions are the main source of nitrogen dioxide (NO_2) in urban areas. NO_2 pollution has become a greater concern in Otago as understanding of its health impacts grows. However, the Air Plan cannot practically impose regulatory controls directly on motor vehicle emissions. Vehicle emission standards and fuel specifications are the province of central government.

160. ORC can indirectly influence vehicle emissions through pORPS policies on urban form and transport, and its contributions to future development strategies and Regional Land Transport plans.

4.6.1. Option 1 - Status Quo

161. ORC currently works to reduce vehicle emissions through the pORPS, involvement in Future Development Strategy processes, in-house activities, and public transport.

162. Several policies and methods in the pORPS 2021 (decisions version) support reduced vehicle movements, including:

- AIR–M3 requires territorial authorities to include provisions in district plans to encourage or facilitate active, shared, and public transport and reduce reliance on non-electric cars, through the spatial distribution of activities.
- EIT–TRAN–P19 prioritises efficient transport networks that integrate land use with transport, especially.
- EIT–TRAN–M8 – requires District Plans to take a strategic approach to integrating activities with active and public transport infrastructure to facilitate travel other than by private vehicle.
- UFD–P3 manages intensification with respect to accessibility for planned active and public transport.

163. One of the goals in the Transport Focus Area of the 2024 – 2034 Strategic Directions is: *Carbon emissions are reduced and air quality is improved across the region, supported by our efficient and affordable public transport services.*

164. In the public transport space, ORC is transitioning all Dunedin and Queenstown buses from diesel to electric in the next few years, with another 13 E-busses due to be added to routes by mid-2025.

165. The Regional Land Transport Plan vision is “A transport and land use system providing integrated, quality choices that are safe, environmentally sustainable and support the regions’ wellbeing and prosperity.” Reducing emissions is a headline target under the RLTP, supported by objectives and policies that promote access to public and active transport and a reduced reliance on private vehicles. While these policies tend to be more focussed on greenhouse gasses, a reduction in emissions will also reduce those substances that are directly harmful to health (principally NO_2).

166. ORC has also worked to decarbonise its work fleet where practicable and promote ride sharing for business purposes.

4.6.2. Option 2 – Increased Non-Regulatory Intervention

167. ORC could choose to amplify current efforts (for example, increase funding for new electric busses) and extend its information and advocacy roles, through activities such as:

- Advocacy to central government for more rigorous vehicle regulation, rigorous emission screening for new vehicles, and funding for public transport,
- Advocacy to other agencies, e.g. to police for enforcing prohibition on smoky exhausts,
- Partnering with territorial authorities to produce public signage, e.g. advising against car idling,
- Public awareness campaigns, using the website, media releases, and other channels to call attention to the health risks associated with vehicle exhausts.
- If possible, incorporating a health focus into the RLTP.

4.6.3. Options Analysis

168. Table 15 summarises the benefits of and issues with the vehicle emissions management options identified in this section.

169. ORC is already undertaking a variety of measures to address vehicle emissions within its remit. While positive advances are being made, it is arguable that the move towards decarbonised transport should be faster and more prominent, in order to reduce the health impacts of NO_2 pollution.

170. These efforts could be enhanced by the additional measures listed under Option 2. However, it is difficult to quantify the return on investment that this additional activity would bring. Except in the case of public transport, ORC does not have direct influence over modes of vehicle transport. It is conceivable that, with increasing public awareness of emissions issues, and changes in approach through district plans, many of the required changes will occur without intervention.

171. Feedback received during the 2024 engagement on air quality management suggested that the community may have limited appetite for increased intervention on vehicle emissions, particularly in smaller urban areas. Among the suggested options for managing vehicle emissions, only the only one supported by more than half of survey respondents was improvements to public transport. Comments from survey respondents indicate that people are aware that ORC has limited control over vehicle emissions and therefore are concerned that non-regulatory interventions would not provide good value (reduction in emissions) for money. Public transport, however, is an existing ORC programme and has multiple co-benefits.

172. Additionally, the levels of NO_2 in Otago do not currently exceed the national air quality guidelines.

Table 15. Benefits of and issues with options for vehicle emissions management options.

	BENEFITS	ISSUES

Option 1 – Status quo	No increase in internal resources or cost to ratepayers. Continued progress towards more compact urban form and better access to public and active transport. Reduced emissions from bus transport.	Rate of change will remain the same and may not be seen as adequate by some.
Option 2 – Increased non-regulatory intervention	Potential for increased awareness of health issues associated with vehicle emissions, contributing to behaviour change that reduces use of private petrol vehicles. A faster rate of change may improve health outcomes.	Compared to the status quo, requires more resourcing from ORC and therefore potentially cost to ratepayers Uncertain whether there is substantial benefit to increased intervention. Likely to be limited community support for increased intervention, particularly in smaller urban areas.

5. Appendices

5.1. Appendix 1: Legislation

5.1.1.1. Resource Management Act (RMA)

173. The RMA sets the framework for natural resource management in New Zealand. The RMA's purpose involves sustainable management of resources to enable people to provide for their social, economic, and cultural well-being, and for their health and safety, while sustaining and safeguarding natural resources for future generations (s5). ORC's key responsibilities for air management are:

- ORC controls contaminant discharges to air in Otago (s30).
- No-one can discharge contaminants to air from industrial or trade premises without a standard or plan rule that allows it, or a consent. All other discharges are allowed unless they contravene a standard, regulation or air plan rule (s15).
- ORC rules can be more stringent than National Environmental Standards but cannot be less stringent unless there is specific provision for that (s43B).
- ORC must observe and enforce the observance of National Environmental Standards, so far as its powers enable (s44A).
- Regional plans need to follow National Regulations, Planning Standards and Policy Statements, and need to be in accordance with the purposes, national matters of importance, Treaty of Waitangi, and other purposes in Part 2 of the RMA (s66).
- In preparing a regional plan, Council must take iwi management plans into account (s66).

5.1.1.2. National Environmental Standards for Air Quality (NESAQ) 2004

174. The NESAQ sets standards for Air Quality in New Zealand that must be given effect through the regional planning framework – see Table 17. Among other things, it prohibits some specific discharges (regs. 6 – 12) and, in schedule 1, sets ambient air quality limits for the concentration of specific contaminants in micrograms per cubic metre (µg/m³) within air sheds.

Table 15: NESAQ limits for PM10

Pollutant	Averaging Time	Concentration limit (µg/m³)	Allowable exceedances
PM_{10}	24-hour	50	1 per year
Carbon monoxide	Running 8-hour	10	1 per year
Nitrogen dioxide	1 hour	200	9 per year
Ozone	1 hour	150	None
Sulphur dioxide	1 hour	350	9 per year
	1 hour	570	None

175. The NESAQ defines the entire region as an airshed and provides for establishing more discrete airsheds (defined geographical areas) for monitoring air quality. ORC has defined 21 groups of towns as four discrete airsheds, with a fifth covering the remainder of Otago, as shown in Table 18. The current Air Zones, which are management areas defined in the Air plan, are given for comparison.

Table 16: Airsheds and Air Zones in Otago

Airsheds	Town	Air Zones
1	Alexandra Arrowtown Clyde Cromwell	1
	Naseby Ranfurly Roxburgh	2
2	Green Island Milton Mosgiel Palmerston South Dunedin	
3	Balclutha Central Dunedin North Dunedin Oamaru Port Chalmers Waikouaiti	
4	Hawea Kingston Queenstown Wanaka	
5	Rest of Otago	3

176. Prior to 2020, section 16B of the NESAQ required gradual improvement in the amount of exceedances recorded. This regulation expired on 1 September 2020, and has not been replaced, Currently, there is no explicit requirement to reduce levels of contaminants, even in cases where the limits in the NESAQ are breached. ORC must decline applications for resource consents to discharge PM_{10} in a polluted airshed under a number of circumstances specified in section 17.

177. If it is likely that limits will be breached in an airshed, ORC is obliged to monitor that contaminant in the airshed (reg. 15) and must give public notice when the limits are breached (reg. 16).

178. The NESAQ also sets design and efficiency standards for domestic wood burners (reg. 22), and prohibits open fireplaces in polluted airsheds (section 24A).

5.1.1.3. National Policy Statement for Greenhouse Gas Emissions from Industrial Heat Process 2023 (NPSGGE)

179. The NPSGGE manages greenhouse gas discharges from industrial process heat production to mitigate climate change effects on the environment and people's wellbeing. This National Policy Statement is relevant to the proposed Air Plan because the proposed Air Plan will manage discharges to air from industrial premises.

180. The NPSGGE aims to phase out or avoid discharges from heat devices that burn coal or other fossil fuels, unless there are no technically or financially viable lower emission alternatives (Policy 1). It also requires Regional Councils to consider cumulative effects of discharges of greenhouse gases when considering resource consent applications for discharges from heat devices (policy 2) and requires resource consent holders to update relevant emissions plans to reflect technological developments and best practice (policy 3).

181. The NPSGG requires ORC to include two prescribed policies in its Air Plan[20], addressing how cumulative effects of greenhouse gas discharges are considered (Part 3.2), and matters for consent holders to consider when updating emissions plans (Part 3.3).

5.1.1.4. Regional Policy Statement (pORPS)

182. The pORPS sets ORC's high level policy framework for resource management. ORC has two regional policy statements to consider:

- The operative pORPS 2019, which Regional Plans must **give effect to**; and
- The pORPS 2021, currently in mediation[21], which Regional Plans must **have regard to**.

5.1.1.5. RPS 2019

183. The RPS 2019 requires ORC to maintain good ambient air quality that supports human health or enhance air quality where it has been degraded. It must also maintain or enhance amenity values (Policy 3.1.6). It also requires airshed emission standards to achieve ambient air quality that supports good human health (Policy 5.4.4).

[20] Otago Regional Plan: Air Amendment (NPS for Greenhouse Gas Emissions from Industrial Process Heat) 30 September 2023

[21] Some parts of the pORPS may have legal effect or be operative by the time that the Air Quality Strategy is in place and the Air Plan notified.

184. In providing for urban growth, the RPS 2019 requires the use of low or no emission heating systems where ambient air quality is below standards for human health, or vulnerable to degradation given local climate and geography (Policy 4.5.1). ORC must also avoid significant adverse effects of offensive or objectionable discharges (Policy 5.4.1).

185. The RPS 2019 does provide for offsetting for air quality in polluted air sheds provided the offset reduces cumulative effect of discharges and improves access to reliable and affordable domestic heating.

5.1.1.6. pORPS 2021

186. Although the pORPS 2021 is still under appeal, the nature and limited scope of the appeals on the Air chapter mean that consequences of the appeal process for developing the Air Regional Plan and Strategy will likely be inconsequential.

187. Air objectives in the pORPS 2021 are:

- Ambient air quality provides for the health and well-being of the people of Otago, amenity values and mana whenua values, and the life-supporting capacity of ecosystems (AIR-O1); and
- The localised adverse effects of discharges to air do not compromise human health, amenity values, mana whenua values and the life-supporting capacity of ecosystems (AIR-O2).

188. The pORPS 2021 supports these objectives by (among other things):

- Requiring that discharges comply with ambient air quality limits (AIR-P1).
- Establishing, maintaining, and enforcing plan provisions that set limits and timeframes for improving degraded ambient air quality (AIR-P2).
- Prioritising actions to reduce PM_{10} and $PM_{2.5}$ in degraded airsheds, including phasing out existing domestic solid fuel burning appliances, and preventing any discharges from new domestic solid fuel burning appliances that do not comply with the standards set in the NESAQ (AIR-P2).
- Avoiding noxious or dangerous effects, and not causing offensive or objectionable effects.

189. The methods require ORC to review airshed boundaries (AIR-M1) and set limits for air quality (AIR-M2). They require territorial authority's (TAs) district plans to include provisions on urban form that encourage reduced reliance on non-electric motor vehicles and reduce reverse sensitivity (AIR-M3).

190. The methods also require ORC (in partnership with Kāi Tahu ki Otago and in collaboration with territorial authorities, key stakeholders and industry) to use non-regulatory mechanisms including education, promoting alternative home-heating technology, financial incentives for improving home heating, and broader advocacy for more resilient and reliable electricity and urban infrastructure (AIR-M5).

191. The Anticipated Environmental Results of these actions – outcomes, in other words – include decreasing trends in PM_{10} and $PM_{2.5}$ (AIR-AER1), elimination of non-compliant burners (AIR-AER3), and compliance with NESAQ standards (AIR-AER6).

192. The Mana Whenua chapter sets ORC's high-level position relating to Kāi Tahu values and interests. It includes provisions requiring ORC to work in accordance with Treaty Principles (MW-P2) and manage the natural environment to ensure Kāi Tahu wellbeing (MW-P3), and well as supporting partnership with Kāi Tahu in resource management processes (e.g. MWM3 and M4).

193. The Integrated Management chapter also supports an intergenerational and holistic approach to resource management.

5.1.1.7. Iwi Planning Documents

194. Regional plans need to take iwi planning documents into account. There are two such plans for Otago.

5.1.1.8. Kāi Tahu ki Otago Natural Resources Management Plan 2005

195. The Kai Tahu ki Otago Natural Resource Management Plan explains that key air quality-related issues for Otago Rūnaka are discharges that adversely affect health, local and ambient air quality, and those that can affect papakāika and mahika kai.

196. The air-quality related objectives of the Natural Resource Management Plan are that:

- Kāi Tahu ki Otago sites of significance are free from odour, visual and other pollutants.
- Kāi Tahu ki Otago are meaningfully involved in the management and protection of the air resource.
- The life supporting capacity and mauri of air is maintained for future generations.

197. A suite of policies support these objectives, several supporting the position of national regulation and legislation. The policies also cover the use of cultural assessments for discharges (Policy 3), positioning of crematoria (Policies 8 – 10), light suppression (Policy 12), consultation and involvement of Kāi Tahu in decision making (Policy 2), and ensuring that the wider implications of air impacts for landscapes, flora and fauna, and people are considered (Policy 1).

5.1.1.9. Te Tangi a Tauira 2008

198. Te Tangi a Tauira describes key air quality-related issues for Murihiku Rūnanga. These are similar to those of Otago Rūnaka, and the related policy suite covers similar ground, though in extended detail and with more focus on localised effects, and the process for decision making. The policies are divided into the following focus areas:

- Industry and farming (Policies 1 to 7)
- Burning (Policy 8)
- Social/cultural effects and iwi engagement (Policies 9 to 19)
- Urban and tourism pressures (Policy 20)

5.2. Appendix 2: Other Regional Council Approaches

199. This section provides a summary of approaches to air quality management in four other regions (Southland, Canterbury, Nelson, and Bay of Plenty), set out according to the following key areas:

- Home heating
- Outdoor burning
- Farming
- Agrichemicals and fertiliser
- Industrial and trade
- Vehicle emissions

5.2.1. Home Heating

200. In addition to the regulatory measures described below, all four regions have used non-regulatory support in the form of subsidies and education. Southland, Nelson, and Canterbury also have firewood certification schemes (Good Wood schemes).

201. The NESAQ standard for compliant burners is that all wood burners installed after 1 September 2005 on properties less than 2 hectares in size must have emissions of less than 1.5g per kg of dry wood burnt and a thermal efficiency of at least 65%.

202. Canterbury has set further definitions in its air plan:

- Existing NESAQ-compliant burners and new burners that achieve a particulate emissions rate of no more than 1 g/kg and 65% thermal efficiency are considered low-emission burners (LEB).
- Ultra-low emission burners (ULEB) are burners that achieve a particulate emissions rate of no more than 0.5 g/kg and 65% thermal efficiency *or* meet an overall emissions and efficiency standard of 38 mg/MJ of useful energy.
- Apart from open fires, all other burners are considered older-style enclosed burners.

203. Other regional councils with recent air plans apply a similar definition for ULEBs, though the efficiency standard of 38 mg/MJ is not used elsewhere.

204. Phase out processes for existing burners that do not comply with new air plan rules generally follow a staged process, based on when non-compliant burners were installed, and the air management needs of the airshed the burner is in.

205. The operational lifetime of a burner is generally around 15 years, based on manufacturer guidelines. Many people keep burners for longer due to both financial constraints and the fact that many burners remain operational past their manufacturer recommended operational life, especially if they are well maintained or repaired. The older a burner gets, the more its efficiency and safety is affected.

206. Other Councils have used a range of timeframes, sometimes varying between different airsheds. ECan has phase out timeframes of 15 years for LEB burners in some airsheds, 20 in others, and there are other airsheds where LEBs can continue to be used.

Southland's Plan uses stepped timeframes for burners in the Invercargill airshed of around 20 - 25 years from installation of the burner.

Table 17: Other regional councils' approaches to managing discharges from home heating.

Southland	In the Invercargill and Gore airsheds: • Newly-installed solid fuel burners must be at least NESAQ-compliant. • 20-25 year phase outs from date of installation for solid fuel burners that are not NESAQ-compliant—(all burners installed before 2005 are now prohibited). • Open fires (new and existing) prohibited. • Some exemptions to phase outs (e.g. for heritage buildings). • Smoky chimney rule that applies when the NESAQ PM_{10} standard is breached. Rest of Southland: • New solid fuel burners on properties smaller than 2 ha must be at least NESAQ-compliant.
Canterbury	Within Clean Air Zones, on sites smaller than 2 ha: • Christchurch, Rangiora, Kaiapoi, Ashburton: o new solid fuel burners must be ULEB, o existing LEB allowed for up to 20 years from installation, o open fires and older-style enclosed burners are prohibited. • Timaru: o new solid fuel burners must be ULEB, o existing LEBs have an age limit of 15 years, o older style enclosed burners allowed for up to 15 years from installation, o open fires are prohibited. • Geraldine and Waimate: o new solid fuel burners must be at least LEB, o open fires and older style enclosed burners are prohibited. • Consent pathway to retain existing LEB using secondary technology (Electrostatic chimney filter). • Some exemptions to phase outs (e.g. for heritage buildings) • Smoky chimney rule. Within Clean Air Zones, on sites larger than 2 ha: • New solid fuel burners must be at least LEB. • Exemptions for solid fuel burners in heritage buildings. • Christchurch, Rangiora, Kaiapoi and Ashburton: use of open fires installed after 2013 prohibited. • Smoky chimney rule. Outside Clean Air Zones (i.e. most of Canterbury), on sites smaller than 2 ha: • New solid fuel burners must be at least LEB. • Smoky chimney rule. There are no solid fuel burner restrictions on sites 2 ha or larger that are outside Clean Air Zones.
Nelson	In the Nelson Urban Area: • The use of open fires is prohibited (with some exemptions) • Phase-outs of older burners (pre-2000) in certain airsheds. • New solid fuel burners replacing older burners must be at least NESAQ-compliant. • New solid fuel burners in houses currently without a burner must be ULEB. • Some exemptions to phase outs (e.g. for heritage buildings). • Smoky chimney rule.
Bay of Plenty	Inside the Rotorua Airshed:

	• Phase out of pre-2005 wood burners and all coal/multi-fuel burners—only existing solid fuel burners installed from 2005 onwards permitted. • New solid fuel burners allowed in dwellings that don't already have a lawfully established burner. • Consent pathway to get a new solid fuel burner in a dwelling without a lawfully established burner— 'offset rule' requiring a burner to be removed from another dwelling (although Bay of Plenty Regional Council is investigating removing this pathway). • Solid fuel burners replacing an existing burner must have a particulate emissions rate of no more than 0.6 g/kg and have at least 65% thermal efficiency (i.e. almost ULEB). • Consent pathway for burners installed after 2005 with secondary technology. • Point of sale rule in Rotorua District Council bylaw requiring any non-compliant solid fuel burners to be removed and replaced with a compliant heating source before a property is sold. • Some exemptions to phase outs (e.g. for heritage buildings). Outside the Rotorua airshed, only the NESAQ requirements apply, along with a requirement to take all reasonable steps to minimise the amount of smoke from a solid fuel burner.

5.2.2. Outdoor Burning

207. Table 20 summarises four regional councils' management approaches for outdoor burning. In general, other regions' outdoor burning rules are less permissive than Otago's current regulatory framework. Some of the key differences in permitted activity conditions are:

- Region-wide requirements to only burn organic material (and in Canterbury and Nelson, this material must also be dry).
- Region-wide setbacks , relating to either boundaries or other activities
- Outdoor burning of plastic, including agricultural wrap, is either a non-complying or prohibited activity region wide.

208. Canterbury and Nelson have stricter requirements for outdoor burning in urban areas, and both Southland and Canterbury have winter burning restrictions, although the Invercargill and Gore airsheds mostly contain urban land. Hawke's Bay Regional Council's Napier and Hastings airsheds contain a considerable amount of rural land, particularly orchards, which might be comparable to parts of Central Otago such as Alexandra, Clyde and Cromwell. Hawke's Bay is therefore included in Table 20 for comparison.

Table 18: Other regional councils' approaches to managing discharges from outdoor burning.

Southland	General permitted activity rule covering most outdoor burning: • Only organic material (wood must be untreated). • On properties smaller than 2 ha, no more than 2 m^3 can be burned within 24 hours. • On properties larger than 2 ha, if more than 2 m^3 of material is being burned within 24 hours, it must be set back at least 100 m upwind and 50 m in any other direction from a neighbouring dwelling or place of assembly, unless written permission from the occupier is obtained.

	• In the Invercargill and Gore airsheds there is an additional restriction: outdoor burning is prohibited May–August. Permitted offal burning must be set back at least 100 m from a property boundary and at least 200 m from a neighbouring dwelling or place of assembly. Permitted crop residue burning must be at least set back at least 300m upwind and 100 m in any other direction of a neighbouring dwelling or place of assembly, unless written permission from the occupier is obtained. Agricultural wrap burning is prohibited. The outdoor burning rules do not apply to small-scale activities such as hangi, barbecues, braziers and fireworks.
Canterbury	General permitted activity rule covering most outdoor burning: • Only organic material (wood must be untreated). • Material must be dry. • Must be on a property larger than 2 ha. • Must be set back at least 100 m upwind and 50 m in any other direction of a neighbouring sensitive activity (includes occupied dwellings and certain public places), unless there is written permission from the occupier, • Within 4 km of a township or Clean Air Zone, burning only occurs when the wind direction will cause smoke to disperse away from the township or Clean Air Zone. • Smoke management plans required if the burning is likely to occur for 3 or more days. • Within some Clean Air Zones, burning must not occur May–August, while in others it can occur but only between 8 am and 4 pm. Permitted offal burning must be on a property larger than 2 ha and set back at least 100 m from a property boundary. In most places, crop residue burning is permitted provided there is a smoke management plan for it. Inside Crop Residue Burning Buffer areas (which surround certain urban areas) it is a controlled activity. Outdoor burning of all plastic, including agricultural wrap, is prohibited. Outdoor burning for community or cultural events and cooking is permitted.
Nelson	Only dry organic material (wood must be untreated) can be burned. In the Nelson Urban Area and Higher Density Small Holdings Area (small rural properties adjoining the Urban Area): • Only small-scale outdoor burning (e.g. fireworks, braziers, cooking fires, fires for traditional craft purposes) are permitted. • No braziers and small fires used for traditional craft purposes are permitted May–August. • Restrictions on the volume of braziers and area of other small fires. • Consent pathway for outdoor burning that breaches the above permitted activity conditions on larger sites (>1 ha if zoned rural, 2 ha if not zoned rural). On rural land: • Outdoor burning is permitted in the Rural Zone (excluding the Higher Density Small Holdings Area), provided if more than 2 m^3 of material is being burned, it will be set back at least 100 m upwind and 50 m in any other direction from a

	neighbouring dwelling. • Outdoor burning is permitted on rural land within the Semi-Rural Boundary (rural land adjoining the Urban Area), provided no more than 2 m^3 of material is burned (unless additional burning is needed for disease control). • Consent pathway for outdoor burning of more than 2 m^3 of material within the Semi-Rural Boundary.
Bay of Plenty	Outdoor burning is permitted if it is at least 100 m from a neighbouring dwelling. Consent pathways for outdoor burning less than 100 m from a neighbouring dwelling if it is for rural production. Outdoor burning of all plastic, including agricultural wrap, is a non-complying activity. Outdoor burning for recreational/cultural purposes is permitted.
Hawke's Bay	Winter burning restrictions: Does not permit outdoor burning in the Napier and Hastings airsheds May – August.

5.2.3. Farming

209. Table 21 summarises four other regional council's management approaches for Farming. Other regions (except for Southland) generally have less permissive rules for intensive farming, either including setbacks as permitted activity conditions or requiring resource consent for it by default. Southland is not included in the below table; Environment Southland is updating its Air Plan in two tranches and, while the Council recognises the issues associated with its current framework, is yet to update its rules for discharges related to farming.

Table 19: Other regional councils' approaches to managing discharges from intensive farming.

Canterbury	Discharges to air from all new intensive pig farming (25+ weaned pigs or more than 6 sows), intensive poultry farming (10,000+ birds) and mushroom farming requires resource consent. Discharges to air from farming of more than 30 cattle is permitted, but if newly established this must meet certain setbacks.
Nelson	Discharges to air from all intensive farming requires resource consent. The definition of intensive farming does not include specific stocking thresholds.
Bay of Plenty	Discharges to air from all intensive farming requires resource consent as does free range pig farming and poultry farming involving more than 100 birds. The definition of intensive farming does not include specific stocking thresholds.

5.2.4. Agrichemicals and Fertiliser

210. Table 22 summarises four other regional councils' management approaches for agrichemicals and fertiliser. Otago's current rules on agrichemical spraying are based on property type, whereas other regional councils' rules are typically based on the method of application. This approach aligns with the industry standard for agrichemical spraying, NZS 8409:2021 Management of Agrichemicals. Some regional air plans refer to earlier versions of this standard.

211. Nelson also has specific requirements for fertiliser application, and Southland has adopted the same requirements.

Table 20: Other regional councils' approaches to managing discharges from agrichemical and fertiliser application.

Southland	Agrichemical spraying using hand-held application methods is permitted provided localised adverse effects are avoided. Agrichemical spraying using other methods is permitted provided: • It complies with NZS:8409. • All users have qualifications or are supervised by someone who does, and a higher level of qualification is required for contractors. • Occupiers of adjoining properties within 500 m of the application area are notified at least 24 hours but no more than 30 days prior to application. • Spraying in public places is publicly notified and there is adequate signage. Fertiliser application permitted if there is no drift over a certified organic farm or an orchard or vineyard with fruit, and there is no application within 30 m of a neighbouring dwelling unless written permission has been obtained from the occupier.
Canterbury	Agrichemicals and fertiliser permitted provided the use complies with the relevant parts of NZS:8409, including those which set out requirements for qualifications, notification and signage.
Nelson	Agrichemical spraying is permitted provided: • All users have qualifications or be supervised by someone with qualifications. • Written records of the activity are kept. • Spray drift does not occur over sensitive locations. • Any affected parties are notified at least 7 days prior to application. • On land accessed by the public, additional restrictions are complied with. These include only knapsack spraying being undertaken and signage being placed at access points. Fertiliser application permitted if there is no drift over a certified organic farm or an orchard or vineyard with fruit, and there is no application within 30 m of a neighbouring dwelling unless written permission has been obtained from the occupier.
Bay of Plenty	Agrichemical spraying is permitted provided: • Anyone using agrichemical spraying methods other than hand-held application methods must have qualifications. • Appropriate signage and notification is undertaken for vehicle and aerial spraying. • Appropriate signage and notification is undertaken for all spraying in public places. Fertiliser application is permitted and there are no specific permitted activity conditions.

5.2.5. Industrial and Trade

212. Industrial and trade rules in other regional council plans can vary remarkably. The topic contains a huge variety of activities, from discharges to air of steam from a laundromat, to the discharge of smoke from a crematorium or odour from a municipal landfill. Most plans permit a wide range of specified low risk activities and require consent for higher risk discharges.

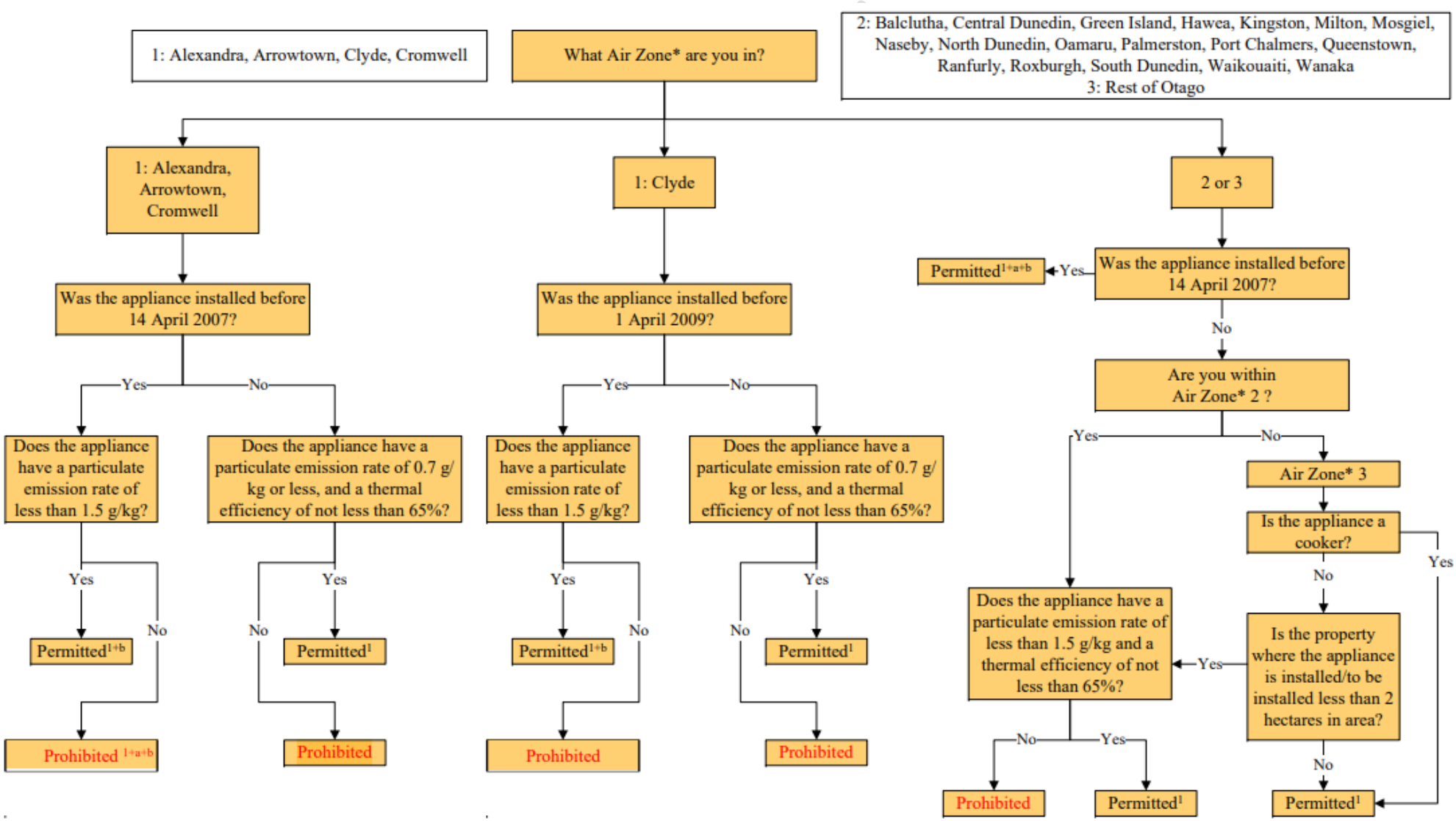
Table 21: Other regional councils' approaches to managing discharges from industry and trade.

Southland	The industrial and trade chapter includes issues, objectives, policies, methods, principal reasons and outcomes, permitted activity rules and conditions and discretionary activity rules. Policies specify: • Protection of the environment • Requiring upgrade of existing processes • Policies relating to the National Policy Statement for Greenhouse Gas Emissions from Industrial Process Heat 2023 • Avoid localised adverse effects • Recognise Māori cultural and traditional values Permitted activities (with conditions) include discharges from: • air contaminating substances from retail distribution, • Bulk storage of fuel • radiocommunication or telecommunication signals • wet abrasive blasting, fibre glassing, or spray painting • and others…. The chapter also contains chimney (smokestack) height requirements. Discretionary activities include: • Masking agents (chemical compounds used to disguise odour) • Burning of landfill materials • Anything not in a permitted activity rule
Canterbury	Policies specify: • Use of best practicable options, • avoiding significant increases in the concentration of PM10, • localised effects of the proposed discharge, • available mitigation and emission control options, • consideration of the effect of combined discharges, • enabling discharges in relation to emergency electricity generation, • appropriate location for activities relating to odour and dust. Permitted activity rules apply to the following, with conditions, with discretionary backstop provisions: • Dust generating activities, • Surface coating and printing, • Waste management, • Other including petroleum, drycleaning, metal working, clay firing etc.

5.2.6. Vehicle emissions

213. Regional air plans typically do not address motor vehicle emissions, as the main controls on them (emission standards and fuel specification) are the responsibility of central government. However, the Southland Regional Air Plan does have some provisions addressing vehicle emissions. Like the provisions in Otago's current Air Plan, these provisions do not contain any rules and are focused on advocacy and education.

5.3. Appendix 3: Flow chart – Status Quo regulatory management for wood burners



5.4. Appendix 4: Timeline