POSITION PAPER ON

National Direction for Vegetables

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Ahumāra Kai Aotearoa

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PART 1

HortNZ's Role

Background to HortNZ

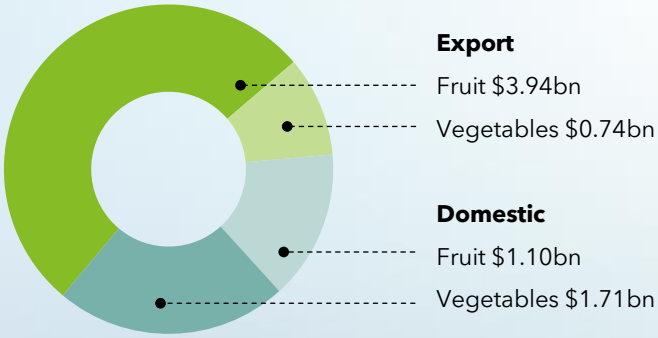
HortNZ represents the interests of approximately 4,200 commercial fruit and vegetable growers in New Zealand who grow around 100 different fruits and vegetables. The horticultural sector provides over 40,000 jobs.

There are approximately 80,000 hectares of land in New Zealand producing fruit and vegetables for domestic consumers and supplying our global trading partners with high quality food.

It is not just the direct economic benefits associated with horticultural production that are important. Horticulture production provides a platform for long term prosperity for communities, supports the growth of knowledge-intensive agri-tech and suppliers along the supply chain; and plays a key role in helping to achieve New Zealand's climate change objectives.

The horticulture sector plays an important role in food security for New Zealanders. Over 80% of vegetables grown are for the domestic market and many varieties of fruits are grown to serve the domestic market.

HortNZ's purpose is to create an enduring environment where growers prosper. This is done through enabling, promoting and advocating for growers in New Zealand.



Industry value $7.48bn

Total exports $4.67bn

Total domestic $2.81bn

Source: Stats NZ and MPI

HortNZ's Resource Management Act 1991 Involvement

On behalf of its grower members HortNZ takes a detailed involvement in resource management planning processes around New Zealand. HortNZ works to raise growers' awareness of the Resource Management Act 1991 (RMA) to ensure effective grower involvement under the Act.

PART 2

Executive Summary

National direction for vegetable production

HortNZ seeks national direction for commercial vegetable production (CVP) to make vegetable growing a permitted activity. This needs to be progressed urgently. Over 20% of New Zealand's fresh vegetable supply is seriously threatened by unworkable freshwater regulations likely to become operative in 2024-25. If over one-fifth of the country's supply of fresh vegetables is disrupted by unworkable regulations, the impact on the price and access to fresh vegetables for New Zealanders will be severe. It is predicted that a 20% price increase is likely, but prices may increase by more than 100%[1].

A consistent approach is needed to ensure that New Zealanders' access to fresh, affordable domestically grown vegetables is not put at risk by regional freshwater regulations. We believe that this can be best provided through a new National Environmental Standard. Workable rules for vegetable production are possible while progressing aspirations for protecting and improving our freshwater.

Why does vegetable production need national priority?

The New Zealand vegetable sector supplies New Zealanders with vegetables year-round. Over 80% of vegetables grown in New Zealand are sold for domestic consumption. It is not possible to import fresh vegetables to meet our population's nutritional needs due to our country's geographic isolation and the perishable nature of the product. This means that a well-functioning sector is critically important for our domestic food security and ensuring New Zealanders have access to healthy and affordable food.

Why now?

Councils have created rules to manage diffuse discharges by requiring land users to reduce nitrogen leaching per hectare incrementally over time. In doing so, Councils seek to reduce the overall load of nitrogen entering receiving waterbodies. If freshwater limits are designed to consider leaching intensity without considering value of the activity, then the social and economic costs of the water quality limits are not adequately assessed.

Farm plans are an effective way to reduce nitrogen leaching through Good Management Practices (GMP). Growers, with industry support, are working hard to move to good and best management practice. Growers can achieve reductions in contaminant discharges with good fertiliser application practices and sediment retention mitigations.

Because vegetable production has low profit margins, there is little room for reductions beyond these practice changes while maintaining economic viability and without forcing land use change away from vegetables. The only options are either to shift to a different

[1] Agchain 2023 Sensitivity of Domestic Food Supply to Loss in Vegetable Growing Production in Specified Vegetable Growing Area. Report for MfE.

production approach or move out of the catchment. Greenhouses, the main alternative growing system, have high capital costs and only a limited range of vegetables can be grown under cover. Suitable locations for vegetable growing are very limited, so once growing is lost from a growing area, it may not be possible to grow the same crop at the same time of year elsewhere.

CVP tends to be a minor contributor toward contaminant load compared with pastoral farming, even in the catchments where large amounts of our vegetable supply are grown. In most cases, the overall impact on water quality from vegetable production shrinking or leaving a catchment is negligible, with an outsized impact on New Zealand's social and economic well-being.

Council rules also struggle to accommodate crop rotation, a millennia-old growing system that involves changing which crop is grown on a piece of land to manage soil health, pests and diseases. As crops rotate, leaching rates change across time and location across a mix of owned, leased and swapped land. Councils have been unsuccessful at designing effective regulation that accounts for this complexity and allows this standard growing practice to continue.

What's the solution?

We need to recognise the value of our domestic vegetable supply and ensure that vegetables are given a priority allocation of the contaminant load for the long-term viability of the sector. The most effective and efficient way to do this is to provide national direction. The alternative – seeking priority in each regional planning process – carries uncertainty, high costs and risks to the sector's ability to supply a range of fresh vegetables year-round.

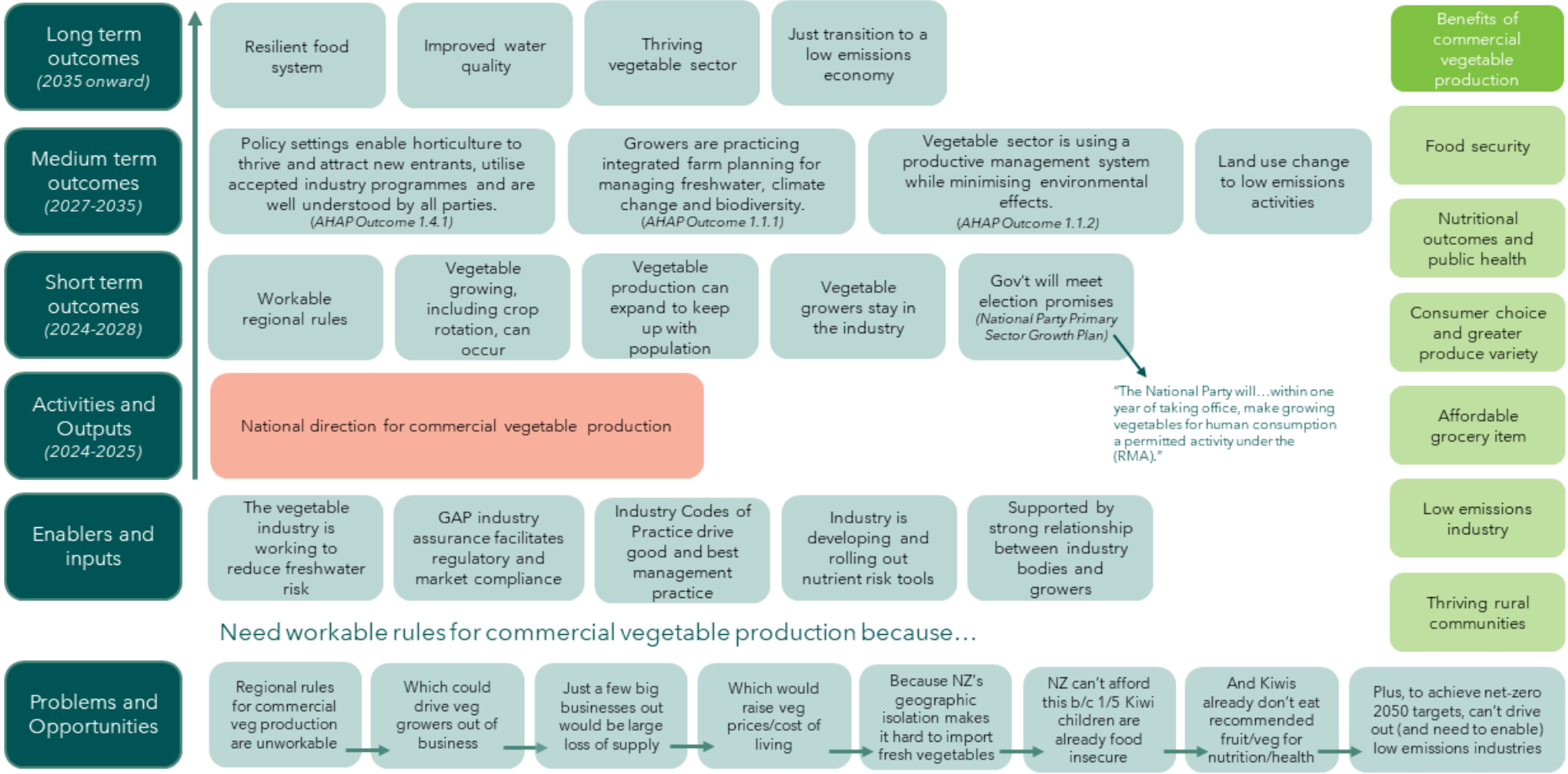
If vegetable production is made a permitted activity with Freshwater Farm Plans, it means that councils must ensure that the nitrogen contaminant load from vegetables is accounted for *within* sustainable catchments limits, such that freshwater outcomes are achieved over time.

For catchments that are below bottom lines and important for vegetable production, we propose an action plan approach in addition to limits to achieve freshwater outcomes. These catchments often have complex water quality issues related to pressures from historic activities and permanently changed hydrology. Limits and action plans need to address all activities in the catchment.

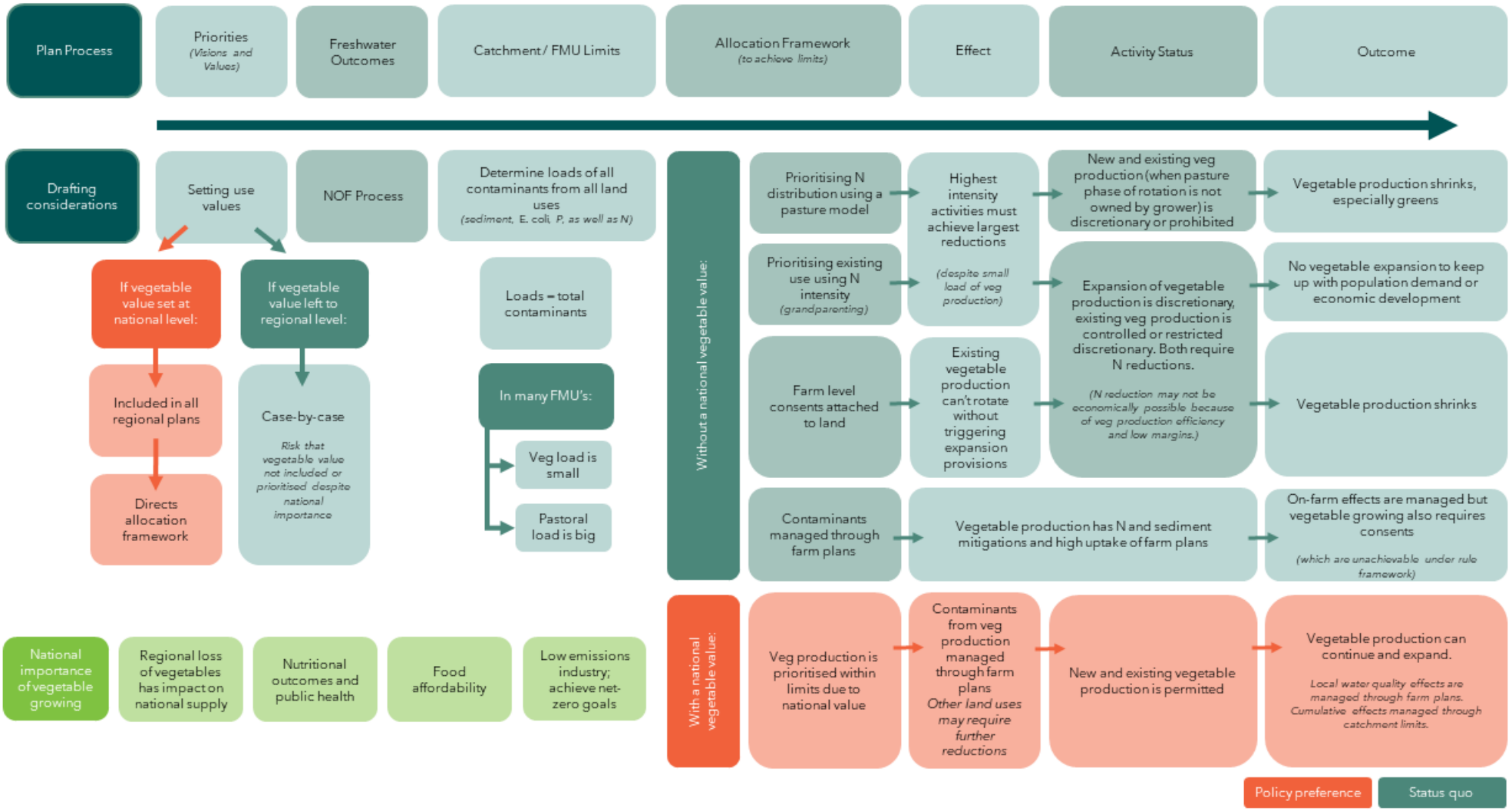
The logic models in Part 3 show the need for national direction for vegetables and how that direction will achieve environmental and social outcomes in line with the Aotearoa Horticulture Action Plan and election promises. Appendix 1 provides a suite of recommended changes to national policy documents, as well as a draft NES for vegetables for consideration.

PART 3

Logic Model: National Direction for Commercial Vegetable Production



Logic Model: Regional Freshwater Planning Pathway for Vegetables



PART 4

The Case for National Policy Direction for Vegetables

1. National importance of vegetable production

Commercial vegetable production (CVP) is a nationally important industry for New Zealand given its contributions to public health and its place in the transition to a low emissions economy.

HortNZ sees food security and reducing emissions as a dual focus for climate action, where these two priorities are held equally without one compromising the other. New Zealand has made an international commitment to achieving this dual priority. The cover decision for COP27 recognised "the fundamental priority of safeguarding food security and ending hunger, and the particular vulnerabilities of food production systems to the adverse impacts of climate change."[2] This put food at the top of the global environmental agenda, and it should also be a priority for New Zealand. Food is simultaneously a necessity for human survival, a possible casualty of climate change, and a sector that can be leveraged to reduce greenhouse gas emissions.

1.1. Domestic food supply and security

Vegetables are essential to nutrition, and New Zealand cannot import sufficient fresh vegetables to meet our domestic demand due to our geographic isolation and the perishable nature of the produce. [3] Over 80% of vegetables sold by New Zealand vegetable growers are for domestic consumption. The rest are mostly onions and process crops for export, which are important to crop rotations with domestically sold crops for soil health and the economic viability of the production system. CVP is a consolidated industry, so should just a few big players exit horticulture due to unworkable rules, there will be a significant loss of domestic vegetable supply.

1.2. Access to healthy and affordable fresh food

Reductions in supply influence the cost of vegetables and reduce the diversity of vegetables varieties grown, raising the cost of living and reducing consumer choice. New Zealand cannot afford this outcome with 17% of Kiwi children already facing food insecurity[4] and only one in nine Kiwi adults meeting the recommended intake of fresh vegetables for a balanced diet.[5] There are complex social and economic reasons why people struggle to meet their

[2] Sharm el-Sheikh Implementation Plan. 2022. COP27_AUV_2 (unfccc.int) (p. 1). Accessed 21 April 2023.
[3] Agchain 2023 Sensitivity of Domestic Food Supply to Loss in Vegetable Growing Production in Specified Vegetable Growing Area. Report for MfE.
[4] Growing Up in New Zealand. Food insecurity (growingup.co.nz). Accessed 30 July 2024.
[5] Annual Update of Key Results 2022/23: New Zealand Health Survey | Ministry of Health NZ

nutritional needs. Addressing the issue of food insecurity will be even more difficult, however, should unworkable freshwater rules preclude commercial vegetable production from achieving consents, decreasing domestic vegetable supply and reducing access to affordable, healthy food. This is the intersection where resource management rules become a public health concern.

1.3. Transition to a low emissions economy

Horticulture has a role to play in New Zealand's transition to a low emissions economy and in meeting our 2050 targets. Agriculture contributes about 53% of New Zealand's greenhouse gas emissions[6] and Oceania has the highest per capita agricultural emissions of any continent (6.5 t CO_2eq per capita).[7] Given the predominance of food production to our national and regional emissions, New Zealand has a vested interest in acquiring agricultural technology and best practices to reduce our emissions.

Diversification to horticulture presents an opportunity to reduce emissions while increasing food production. In New Zealand, there are 1,000,000 ha of land that could potentially be converted to horticulture to meet increased demand for plant-based foods. If this land was converted to horticulture, it would be as effective at reducing New Zealand's agricultural emissions as a methane vaccine.[8] New Zealand horticulture produces over $7 billion of value in the export[9] and domestic markets[10] while using only 133,000 ha of land,[11] making it an incredibly efficient use of land and resources.

2. Unworkable policy and rules threaten vegetable production

CVP faces unworkable freshwater rules in multiple regions, and the consequences should these rules progress are tangible and serious for the public interest. Each region's rules are important, not just the biggest vegetable growing regions. When poor weather strikes, if there is not enough geographic diversity in growing, the reduced resilience in the national vegetable growing system will leave New Zealanders exposed to vegetable shortages and fluctuations in prices that contribute to an increased cost-of-living.[12] Vegetables are sold through complex supply chains where they are trucked or shipped all over the country, not just sold locally within the region they are grown. Each region's vegetable growing contributes to national supply, so consistent and workable nationally consistent rules are needed to provide for the health of the nation.

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[6] MfE. "New Zealand's Greenhouse Gas Inventory 1990-2022: Snapshot". 18 April 2024. Accessed 30 July 2024.
[7] FAO. 2022. Greenhouse gas emissions from agri-food systems – Global, regional and country trends, 2000–2020. FAOSTAT Analytical Brief No. 50. Rome. Accessed 20 April 2023.
[8] Dorner, Z et al. (2018) Land-use Change as a Mitigation Option for Climate Change. Report to the Biological Emissions Reference Group (Project No. 18398) https://www.mpi.govt.nz/dmsdocument/32140/direct Accessed 24/04/23. (p. 12)
[9] MPI. *Situation and Outlook for Primary Industries*. June 2024.
[10] StatsNZ. Household Economic Survey. Year End 2023.
[11] StatsNZ. "Agricultural and horticultural land use". 15 April 2021. Accessed 30 July 2024.
[12] Stats NZ. "Food price index". https://www.stats.govt.nz/topics/food-price-index. Accessed 30 July 2024.

2.1. Nitrogen loss intensity as the primary method for diffuse discharge allocation without regard to activities' relative load

Nitrogen loss intensity is a measure of nitrogen loss risk, but regional plans that focus on reducing the highest leaching activities may not deliver the nitrogen load reductions required to achieve freshwater outcomes. Under Waikato Plan Change 1 (PC1), CVP contributes only 3% of the nitrogen load, but it is the only farming activity that does not have a permitted activity pathway. In the Horowhenua, 68% of the nitrogen load is contributed by grazing land. Unirrigated sheep and beef farming has a permitted activity pathway and dairy farming has a consenting path[13]; CVP, which only contributes 23% of the load, has an unachievable consenting pathway[14].

2.2. Nitrogen loss intensity as the primary method for diffuse discharge allocation when other contaminants are the primary problem in some catchments

In many regional plans, nitrogen limits have been used as a proxy for water quality effects. Nitrogen is not the only contaminant of concern in many catchments, and other contaminants may require greater reductions to achieve freshwater outcomes. In the Hawke's Bay TANK plan, target attribute states (TAS) for nitrogen are generally acceptable, but nitrogen intensity is used as the limit for land use change despite significant improvements required for phosphorus and *E. coli*. Under this plan land use from vegetable growing to dairy farming is more stringently managed than land use change from dairy farming to CVP.

The reason nitrogen intensity has been used is because it is a reasonable proxy for other contaminants for dairy farming. This is not the case for CVP, which has relatively high nitrogen and low *E. coli,* or sheep and beef farming, which has relatively low nitrogen and high sediment losses. [15]

In receiving waters where sediment and *E. coli* are the contaminants of concern, relying on nitrogen limits as the primary method of managing intensification may not deliver the desired range of community values in receiving environments.

2.3. Land use consents that run with the land

Most plans regulate limits under the Resource Management Act 1991 (RMA) using a land use control (Section 9), either instead of or in addition to, a discharge control (Section 15). Land use and subdivision consents are attached to the land. The RMA does not specify that land use consents run with the land parcel. The land parcel has, however, become the default unit for land use consents, and land use consents are sold with land parcels.

The problem for CVP is that the allocation of a nitrogen limit to parcels does not provide for crop rotation. Crop rotation is the practice of changing the crop species grown on the same

[14] Agchain 2023 Sensitivity of Domestic Food Supply to Loss in Vegetable Growing Production in Specified Vegetable Growing Area. Report for MfE.

[15] Sands M, et al 2017, *Healthy Rivers Plan Change Technical Support for Horticulture New Zealand's Submission*. Jacobs (Appendix B)

soil. Crops are grown in a specific sequence, or in rotation with pasture for animals, to manage soil health, pests and diseases. Over time, crops in a rotation perform better than those in continuous production. Crop rotations happen over space (growers leasing/swapping paddocks) and time (cycle of different uses for the paddock).[16]

CVP may rotate from within the same catchment onto a parcel that was not used for cropping before. The parcel may not have been allocated enough nitrogen (via grand-parenting or natural capital approaches) to provide for CVP on the parcel. If CVP on the parcel exceeds a nitrogen intensity threshold, a consent may be required. This consent could be required even though the grower is still undertaking the same activity, for example the same crop area, the same crop rotation, in the same catchment.

In the case of leases, if a consent is attached to a parcel, the consent would manage the activity undertaken by the leaseholder, but the landowner would own the consent and keep the consent at the end of the lease. This might present an opportunity for the landowner to intensify the land into an activity which is not CVP, once the rotation phase or lease on that property is complete. The vegetable grower may be faced with re-consenting their existing operation at the end of each lease. Given the short-term nature and the number of leases many growers hold, requiring a new consent at the end of each lease is an unworkable requirement.

2.4. Allowing for crop rotation and business turnover

One pitfall for regional freshwater rules is that they often distinguish between new and existing CVP without accounting for the dynamic nature of crop rotation and business turnover.

When a grower moves to a new leased, swapped or owned paddock, that is just movement of existing CVP, not expansion. Because consents are often tied to specific land parcels in regional plans, rotation can erroneously trigger expansion rules.

Regional plans also lack provisions to manage when a grower leaves the industry, but their market share (and amount of growing area) is taken up by a new business. The sector is structured such that when one grower exits and another enters, the new grower does not necessarily buy the previous growers land; they simply take up market share of the production. This is a replacement rather than expansion, even if the new business is growing in a different location than the one that stopped growing.

National direction for vegetables needs to permit crop rotation and allow consents to carry forward when a grower leaves the business, and another takes their place. In plan changes such as Waikato PC1, Manawatu-Whanganui Plan PC2 and Canterbury PC7 where grandparenting approaches for CVP have been developed, the "existing" allocation is to a business operating on land within a catchment rather than to specific parcel of land. HortNZ supported this approach in these plan changes to respond to the rotational nature of CVP. However, this approach to grandparenting creates another issue where the allocation to "existing" CVP is lost when businesses change. The Primary Sector Growth Plan NES CVP proposal[17] risks treating changes in operators as "expansion" and subjecting existing CVP to a consenting framework.

[16] Levenson,et al. "Fresh produce and freshwater". HortNZ. 12 December 2023. Accessed 30 July 2024.
[17] National Party. "Primary Sector Growth Plan". Accessed 30 July 2024.

2.5. Allowing for CVP expansion

Due to the specific soils and climate required to grow fresh vegetables year-round, CVP for the domestic market has a need to be in some in catchments that have nitrogen below the bottom lines. The consenting regimes for "expansion" in the Waikato PC1, Canterbury PC7 and Manawatu-Whanganui PC2 are constraining. Economic evidence suggests no expansion of CVP will occur in these catchments, because it is too costly for growers to expand and meet the consented conditions required under these plans[18]. If a similar consenting regime was required under the Primary Sector Growth Plan NES CVP proposal, then CVP would not expand to meet domestic demand, and would likely contract due to the issues above. Therefore, the Primary Sector Growth Plan NES CVP proposal risks driving reduced vegetable production, increased vegetable prices, and contributing to an increase in the cost of living for New Zealanders.

For CVP to expand to meet population growth, there may need to be some land use change to CVP. This expansion provides an opportunity to drive the transition to a low emissions economy while reducing activities with greater environmental effects, including sediment, phosphorus and *E. coli* contamination.

2.6. Discharge consents and diffuse discharges

Recent court decisions regarding discharges and S70 and 107 of the RMA have pressing implications for horticulture in New Zealand. These issues pose threats to future consenting and operation of horticultural activities, which will have negative consequences for national food security, the economy, exports and the environment. These decisions are described in more detail in Part 7 of this report.

2.7. Unworkable regional policy

In most regions CVP is a permitted activity, but in those regions where Freshwater Plans have been developed to implement the NPSFM 2014, policies and rules have developed that are unworkable or very constraining for vegetable production.

2.7.1. WAIKATO PLAN CHANGE 1

The council's proposed approach will result in an extremely difficult consenting regime, and likely result in a reduced area of CVP compared to the existing situation. Existing CVP is required to obtain a controlled activity consent, with a lack of clarity on whether crop rotation can occur onto land that is not already in CVP. Expansion of CVP is capped at fraction of the area required to meet population demand, and subject to a discretionary consenting path, and expansion above the cap is non-complying.

Overseer use was a major issue through mediation and the Environment Court hearing as the decisions version of PC1 uses nitrogen leaching loss rate calculated using Overseer as a proxy for risk. HortNZ produced strong evidence showing that Overseer is not an appropriate decision support tool for CVP. HortNZ sought a risk-based management approach and tools developed for horticultural use specifically, using Freshwater Farm Plans and a vegetables risk scorecard instead of Overseer being used for CVP.

Through the hearing, HortNZ sought that crop rotation for CVP be enabled at a Freshwater Management Unit scale. HortNZ also sought proportional treatment of CVP compared to

[18] Ford, S. 2019. Memorandum to HortNZ. Accessed 30 July 2024.

other resource users as CVP is generally set to receive a more restrictive consenting pathway under PC1 than others (like dairy and sheep and beef farms which can comply with permitted activity standards in some cases). HortNZ sought a larger cap for CVP expansion linked to population growth, and a policy framework that would support the discretionary consent being able to be granted, as appeals on the discretionary pathway sought to make this pathway unachievable.

The Environment Court hearing was held in October and November 2023. A further workshop was held in April 2024, and some further evidence was sought by the Court. The evidence was filed in May 2024 and we are awaiting the decision, with the plan likely to be operative in 2024-25.

2.7.2. MANAWATU – WHANGANUI PLAN CHANGE 2

The council's proposed approach will result in a reduced area of existing CVP and an extremely difficult consenting framework for expansion of CVP.

Plan Change 2 sought to improve the workability of the One Plan provisions that manage existing intensive farming land uses (dairy farming, commercial vegetable growing, cropping and intensive sheep and beef) in target water management sub-zones.

Under the One Plan, consent is required for existing intensive farming land uses within targeted Water Management Sub Zones. This covers a large proportion of the area in which vegetables are grown, and the One Plan required consents for the majority of CVP. To get consent, CVP had to meet absolute Overseer numbers in the One Plan. However unfortunately these numbers were not set by reference to CVP operations, they were set with reference to the grass growth rates (grass curve) using dairy farm Overseer modelling. Meaning that it was never possible to CVP to meet the absolute Overseer numeric limits. Updates to Overseer created issues with meeting the numbers in the plan for dairy farms as well. This framework resulted in only one CVP operator being granted consent. This situation persisted for several years, and PC2 aimed to amend the One Plan to enable consenting for existing intensive farming land uses by updating the Overseer numeric limits in the One Plan and providing a viable consenting pathway for activities that would not meet the updated Overseer numeric limits in the plan.

Submissions on PC2 sought the inclusion of an additional pathway to consent through a controlled activity option where the updated Overseer numeric limits in the plan could not be met. This was particularly important for CVP green vegetables growers who are unlikely to be able to meet the updated Overseer numeric limits.

The Commissioners Decision issued on 19 March 2021 supported the controlled activity pathway which required a 35% reduction in leaching from baseline for CVP and held that where an activity could neither meet the updated Overseer numbers nor the 35% reduction then a discretionary activity status was appropriate.

This decision was appealed by a number of appellants. The appellants sought that there be no controlled activity consent option – that is, that CVP would need to meet the updated Overseer numeric limits for a controlled activity consent. HortNZ, Horizons Council, and Federated Farmers opposed this, seeking the ability to get a controlled activity consent where good management practices and best management practices could be demonstrated that would lead to leaching reductions. In the alternative HortNZ sought the retention of the 35% reduction-controlled activity pathway for CVP, noting this is not the

preferred pathway for CVP as this pathway is dependent on Overseer, and it is now accepted that Overseer is not a reliable tool for farm scale CVP leaching estimates[19].

Only two CVP farms are estimated to be able to meet the updated Overseer numeric limits required for the controlled activity consent, and therefore if the appellants are successful then nearly all CVP will require a discretionary consent. No CVP applicant is guaranteed to be successful when applying for a discretionary consent. Should the appellants be successful, and the Environment Court agree that there should be no alternative reduction of good management practice/best management practice-controlled activity pathway, the viability and continued feasibility and certainty of 20% of NZs green vegetables for domestic supply[20] would be uncertain.

The Environment Court hearing will close soon, with a decision expected in late 2024, with the plan becoming operative in 2024-25.

2.7.3. CANTERBURY PC 7

Canterbury Regional Land and Water Plan Change 7 (PC7) decision is partially operative from 1 September 2023 and provides a revised consenting framework for commercial vegetable growing (CVG).

PC7 addressed an issue for existing CVP where, the grandparenting approach created difficulty in consenting CVP that had changed locations due to crop rotation. With PC7 there are three ways that existing CVP can be consented. CVP can be consented as part of an irrigation consent, as part of a farm consent or as a standalone activity under the CVP consenting pathway created by PC7.

PC7 recognises the importance of commercial vegetable production for domestic food supply. The PC7 approach improved the Land and Water Plan by providing a consenting pathway for existing CVP provided the land area has not expanded, but the location within a nutrient management area can change. In addition, the PC7 decision recognised that Overseer was not a reliable tool for CVP and required that farm plans that demonstrate the uptake of GMP are the main tool for regulating CVP.

The expansion of CVP within the Land and Water Plan is still challenging, due to the grandparenting approach. With CVP only being able to expand onto land with a higher nitrogen leaching baseline, expansion is not possible for green vegetable rotations, but is possible for less intensive rotations.

Many existing CVP growers in Canterbury are consented within irrigation schemes or grow vegetables within mixed farms and have farm consents. With the Overseer review, council is relying less on Overseer and more on alternatives such as inputs. For CVP regulation of inputs needs to be sufficiently flexible to account for the full crop rotation where the crops grown, the location of crops and their nutrient demand change from year to year, for this reason a freshwater farm plan approach is more appropriate than either Overseer modelling or input controls for CVP.

[19] MPI. "Overseer technical review process". 2 October 2023. Accessed 30 July 2024.
[20] United Fresh. "Fresh Facts 2023 – New Zealand's Fresh Fruit and Vegetable Industry". Accessed 30 July 2024.

2.7.4. HAWKES BAY TANK PLAN CHANGE

Under the TANK plan existing CVP is a permitted activity, however CVP expansion requires consent. There is some recognition of crop rotation, but it is unclear whether a change in location of existing CVP would trigger a need for consent. The land use change consenting framework is related to nitrogen leaching intensity, and the framework assumes CVP is the highest leaching activity. Given the process crops that are grown in Hawkes Bay this is not necessarily the case. This rule is problematic in the recovery following Cyclone Gabrielle, where some land that was in orchard may be better used for CVP, given the flood risk.

PART 5

Economics of CVP

The economic margins of vegetable production are relevant to the assessment of the potential uptake of mitigations. The impacts of freshwater limits on the cost of vegetable production are relevant to price of vegetables.

3. Gross Margins of CVP

The gross margins of vegetable production are on average very slim with the weighted average data indicating that the average annual profit of Pukekohe rotations is only approximately 10% of the revenue[21]. These relatively low margins mean there is limited economic ability of growers to implement costly mitigations.

The costliest and most effective water quality mitigation is indoor or covered growing.[22] Indoor growing occurs in New Zealand for high value vegetables (such as tomatoes, capsicums, cucumbers and premium salad and herbs). For this system to be applied more widely, either the cost of indoor or covered growing would need to significantly reduce, or the price of vegetables (and the ability of New Zealanders to pay for them) would need to significantly increase. In any case, this growing system is only suited to some crops.

In many regions, the only method that could be used by CVP to achieve nitrate intensity limits set for regulating land use change, (and in the case of Horizons, regulating existing CVP within Target Water Management sub zones) would be to reduce production per hectare. Given the gross margins of CVP, it is not economically viable to reduce production to the degree required to meet these limits. This means that CVP will not occur where this is the requirement.[23]

The most cost-effective mitigations, (nutrient tools, tests, rotation and catch crops)[24] are core elements of industry codes of practice and industry assurance, such as the New Zealand Good Agricultural Practice (NZ GAP) Environmental Management System (EMS) standard.

4. Economic Efficiency of Vegetable Production

CVP is efficient at using nitrogen inputs. For example, in the Waikato N conversion efficiency for CVP were estimated at 76% compared to dairy farming at 34%.[25]

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[21] PerrinAg 2023 Horticulture Typology Modelling for FWMT a Technical modelling report. www.aucklanddesignmanual.co.nz/media/e53gygxa/horticulture-typology-modelling-for-the-fwmt.pdf

[22] Hu W, Clothier B, Brown H, Thomas S, Sharp J, Searle B. June 2023. Assessing and modelling the environmental performance of horticultural land uses. A Plant & Food Research report prepared for: Ministry for Primary Industries. Milestone No. 95212. Contract No. 40502. Job code: P/441041/01. PFR SPTS No. 23816.

[23] Ford, S. 2019. Memorandum to HortNZ. Accessed 30 July 2024.

[24] Thomas S, Trolove S, Fraser P, Langer S, van der Klei G, Michel A, Greer G, Gee M, Searle B, Hall M. June 2021. Options to mitigate nutrient leaching from commercial vegetable production. A Plant & Food Research report prepared for: Ministry for Primary Industries. Milestone No. 90617. Contract No. 39109. Job code: P/443082/01. PFR SPTS No. 21094.

[25] Ford S, 9 July 2019. PC1 Evidence. Accessed 30 July 2024.

Vegetable production is very efficient at producing food, for example CVP may leach half as much nitrogen per kilogram of food produced when compared with milk and red meat production. CVP requires receiving environments to assimilate less contaminants per tonne of food produced than pastoral farming activities.[26] Vegetable production is also efficient when its economic contribution relative footprint, employing up to ten times more people per hectare, compared with pastoral farming.[27]

5. Cost of Production and the Price of Vegetables

Vegetable growers are generally price-takes, but the price of vegetables is very sensitive to shortages in supply.[28] If the cost of meeting freshwater limits cannot be economically achieved by CVP, the production of vegetables in NZ will reduce and shortages in supply will occur more frequently.

AgChain undertook a study for MfE in 2023[29], and found that if CVP production was constrained aby 5-10%, the expected price increase would be between 10-20%, and if the production impact was more than 20% a significant price increases of 20% - 100% or more could be expected.

In a report that was completed for HortNZ, Deloitte[2] identified that by 2043 Auckland's population will have increased by 37%, based on 2018 predictions, which will result in the demand for fruit and vegetables increasing by 33% and the growth of the production sector to meet that demand will be by 39%. Under Deloitte's Rigid constrained scenario which is described as "land scarcity is further constrained by land use restrictions" their modelling using the Deloitte Access Economics regional general equilibrium model, predicts an annual economic loss of $1.1b, a loss of 4,500 FTE's, a decrease in production of 55% and a resultant rise in vegetable prices of 58%. [30]

6. Price of Vegetables, Health Outcomes and Health Costs

Following on from the Deloitte report, HortNZ commissioned Dr Cristina Cleghorn of Otago University to investigate the health system impacts of the predicted increase in vegetable prices over time. In her report, Dr. Cleghorn modelled two scenarios where the price of vegetables increases each year for the next 23 years, firstly by 2% a year and secondly by 2.5% a year to match the expected price increase modelled by Deloitte. [31]

The 2% and 2.5% cumulative increase in New Zealand vegetable prices from 2020 to 2042 is predicted to result in a decrease in daily vegetable intake of 69 grams and 94 grams by 2042.

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[26] Jay Clarke 2023 Evidence for PC2 Horizons Environment hearing – Appendix to Evidence of Michelle Sands, 2023 Evidence for Horizons Environment Court hearing.
[27] Jay Clarke 2023 Evidence for PC2 Horizons Environment hearing – Appendix to Evidence of Michelle Sands, 2023 Evidence for Horizons Environment Court hearing.
[28] Ford, S. 28 July 2023. PC1 Environment Court Evidence. Accessed 30 July 2024.
[29] Agchain 2023 Sensitivity of Domestic Food Supply to Loss in Vegetable Growing Production in Specified Vegetable Growing Area. Report for MfE.
[30] Deloitte. August 2018. New Zealand's food story: The Pukekohe hub. Accessed 30 July 2024.
[31] Cleghorn, C. August 2020. The health and health system cost impacts of increasing vegetables prices over time. University of Otago. Accessed 30 July 2024.

The 2% cumulative increase is predicted to result in a 58,300 reduction in health adjusted life years (HALY) and $490 million in costs to the health system. The 2.5% price increase produced overall HALY losses that were 25% greater and costs to the health system that were 24% greater than the 2% cumulative price increase at 72,800 reductions in HALY and $610 million. For context, the Treasury cost benefit tool (CBAx) values the gain of a QALY at $43,313 per year.[32]

[32] The Treasury. 21 December 2023. "CBAx Spreadsheet Model". Accessed 30 July 2024.

PART 6

Water Quality Effects Associated with CVP

CVP, like all farming activities, contributes localised risks and cumulative effects on water quality and the freshwater values water quality supports. The cumulative water quality effects of CVP can be managed through setting catchment scale contaminant load limits which account for the cumulative point source and non-point source discharges from all activities, and in some cases the implementation of additional actions such as catchment scale mitigations, the purpose of these limits and actions is to achieve freshwater outcomes over time.

Localised water quality risks from CVP can be managed through the application of good and best practice management practices on farm, with the adoption of GMP achieving reductions in the order of 10-30% for nitrogen and over 60% for sediment and phosphorus for growers not already operating at GMP. However, for growers already operating at GMP, the cost of additional reductions, particularly in fertiliser use, has a significant impact on profit due the impact on reduced yield and increased wastage.

7. Localised Water Quality Risks

When assessing effects on freshwater, the smallest scale where a water quality effects assessment can be undertaken is the catchment[33]. Predicting the water quality effects of activities and mitigations requires models. The calibration of models relies on sufficient data and the architecture of the model sufficiently representing localised characteristics. Freshwater models calibrated to monitoring data in receiving waters, may be reliable at the national, regional, FMU and large river scales. These models have lesser reliability at smaller stream catchment scale and are unsuitable to assess effects at the farm scale[34].

The focus for managing the effects of discharges on localised groundwater and tributaries, and ultimately on the cumulative effects of farm scale discharges, is on assessing the risks of discharges and mitigating these risks. Risk mitigation at the farm scale, supports catchment scale effects assessment, that rely on generalised predictions about the effectiveness and uptake of farm scale mitigations.

Intensity (kg/ha losses or kg/ha inputs) is a relevant metric at the farm scale for managing localised risks, because this metric supports growers to focus their mitigations on those activities or parts of the farm that generate the most contaminants. Intensity (kg/ha losses or kg/ha inputs) can be used to compare farms, but care should be taken when using intensity in water quality assessments or the design of water quality limits. Intensity is a measure of farm scale risk but is not a measure of environmental effects[35]. Intensity is also not a measure of efficiency.

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[33] Holmes, G. 13 October 2023. PC2 Evidence, paragraph 21. Accessed 30 July 2024.
[34] Easton, S. 28 July 2023. PC1 Evidence. Waikato Environment Court, paragraph 39,40. Accessed 30 July 2024.
[35] Holmes, G. 13 October 2023. PC2 Evidence, paragraph 21. Accessed 30 July 2024.

Technical efficiency (output/input, for example N Surplus) is a relevant metric at the farm scale for managing localised risks, because it supports growers to optimise production to reduce the risk of losses. Care should be taken when using technical efficiency in water quality assessments or the design of water quality limits, because technical efficiency is not a measure of environmental effects, and allocative efficiency is a relevant consideration in designing freshwater outcomes and limits.

7.1. Farm scale nitrogen losses

CVP rotations have a range of leaching rates. Some CVP has relatively low leaching rates similar to arable, sheep and fruit production for some process vegetable rotations, moderate leaching rates equivalent to moderate dairy or beef farming for potatoes and root vegetable rotations that include pasture phases, and relatively high nitrogen leaching rates for vegetable rotations that are dominated by green vegetables. Rotations that plant crops such as potatoes in winter to provide domestic vegetable supply in spring also have high leaching rates. These high intensity vegetable rotations have similar or higher leaching rates than the highest intensity dairy farms.[36].

Leaching rates are variable throughout the year, and measured leaching rates are not comparable to average annual leaching rates. Measured leaching rates are useful for model calibration. High leaching rates have been measured under vegetable production and winter forage crops[37]. The comparison to winter forage crops is useful, because when farm level leaching rates are calculated for pastoral farms, the highest leaching blocks, i.e. forage blocks, are frequently averaged over the whole farm.[38] CVP has lesser environmental risks than intensive winter grazing (similar for nitrogen, but lesser for *E. coli* and sediment), and the CVP area is less than one quarter of the area of intensive winter grazing nationally (50,000 ha for CVP and 222,697 ha of Intensive Winter Grazing)[39].

The effectiveness of nitrogen mitigations is dependent on the CVP rotation, and the baseline, as growers have adopted good practices there are lesser improvements that are predicted.

7.1.1. HOROWHENUA

Detailed Overseer modelling undertaken for Horizons, of CVP in the Horowhenua[40] tested a scenario described as 'pre and post 2019 practices' for three CVP rotations. This modelling found that with the adoption of the NZGAP EMS and all appropriate mitigations (including the latest crop nutrient recommendations[41]) the predicted reduced leaching was different

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[36] MPI. February 2021. Refining estimates of nitrogen leaching for the New Zealand agricultural greenhouse gas inventory. Accessed 30 July 2024.

[37] MfE. March 2023. "Papa otaota: Groundcovers – Guidance for intensive winter grazing." and Norris, M, et al. June 2018. Rootzone reality: technical review on network performance. Plant and Food Research. Accessed 30 July 2024.

[38] Smith, C., Monaghan, R. September 2013. Comparing OVERSEER estimates of N leaching from grazed winter forage crops with results from Southland trial sites. Report prepared for Environment Southland. Accessed 30 July 2024.

[39] 222,697 ha of intensively grazed forage nationwide in 2021. This compares with an estimate of 40,000 ha of CVP. S Bellis, et al. June 2022. National winter forage – intensive winter grazing map for winter 2021. Manaaki Whenua Landcare Research; United Fresh. Fresh Facts 2023. Accessed 30 July 2024.

[40] Bloomer, D., Posthuma, L., O'Brien, G. 2020. Modelled Loss of Nutrients from Vegetable Growing Scenarios in Horowhenua. Report for Pattle Delamore Partners.

[41] Reid, JB and Morton, JD. 2019. Nutrient Management for Vegetable Crops in New Zealand. Accessed 30 July 2024.

for each rotation at 7% for the potato/onion rotation, 11% for the brassica rotation and 45% for the intensive vegetable rotation. When these farm scale percentage reductions are applied at the catchment scale, the weighted average reduction from CVP in the Waiopheu (Horowhenua) FMU, the reduction was 34%, because CVP only makes up 14% of the nitrogen load in the Waiopheu (Horowhenua) FMU, the effect of a 34% reduction in CVP nitrogen load associated with the adoption of the post 2019 good practices is a 5% reduction in nitrogen load at the FMU scale.[42]

7.1.2. WAIMEA PLAINS

SPAMSO modelling was undertaken for Tasman Council.[43] Two combinations of outdoor vegetable crops were identified as representative from a grower survey:

1. lettuces, leafy greens (e.g. spinach), and cabbages, and

2. cauliflowers and onions.

Average practice reported by growers was modelled for each crop group. In addition, practice using the standard fertiliser recommendations from the nutrient management guideline for vegetable crops in New Zealand crop book were modelled for each crop group for comparison.[44]

Reducing nitrogen fertiliser application use for winter lettuce from 101 kg N/ha to 57 kg N/ha showed only a marginal reduction in nitrate losses, and the reduction was only on Ranzau and Waimea soils, not the heavier soils. Given the small reduction in nitrogen losses, any loss of lettuce yield and quality resulting from lower nitrogen fertilizer application becomes a more important factor. Reducing nitrogen fertiliser on onions and lettuces, however, showed a larger reduction in what are already high nitrate losses for all soil groups. Reductions ranged from 13% on Ranzau soils to 21% on Waimea soils, to 31% on heavier Richmond soils. Nitrate losses remained very high for the Ranzau soils, exceeding 100 kg N/ha/yr.

7.1.3. PUKEKOHE

Detailed APSIM and economic modelling undertaken for Auckland Council and HortNZ tested the effectiveness and economic impact of good management practices for five Pukekohe rotations.[45] This modelling tested improved irrigation and fertiliser reductions and the economic viability of adopting these mitigations.

The improved irrigation scheduling mitigation reduced profit by approximately 17% and nitrogen yield by 24%. The first fertiliser mitigation (-2% fertiliser on high nitrogen loss crops, combined with improved irrigation scheduling) reduced profit by 88% on high slope and 90% on low slope land while nitrogen loss reduced by 31%. The subsequent two mitigations reduced profit by over 100% and generated a 'negative profit'. They also reduced nitrogen

[42] Holmes, G. 13 October 2023. PC2 Evidence, Appendix B. Accessed 30 July 2024.
[43] Fenemor, A., et al. September 2023. Modelling of nitrate losses and impacts from Waimea Plains rural land uses. Manaaki Whenua. Accessed 30 July 2024.
[44] Reid, JB and Morton, JD. 2019. Nutrient Management for Vegetable Crops in New Zealand. Accessed 30 July 2024.
[45] PerrinAg 2023. Horticulture Typology Modelling for FWMT: A technical modelling report. Accessed 30 July 2024.

loss by 30% (-5% reduction in fertiliser) and 34% (-10% reduction in fertiliser). All the changes in economic performance and contaminant yields because of the nitrogen fertiliser mitigations include the impact of the irrigation mitigation.

Reduced fertiliser use scenarios resulted in such a significant loss in profit because most of the growers who participated in the study were operating at or close to GMP. Therefore, this study demonstrated that when fertiliser is reduced below crop demand, there are significant losses due to yield reductions and increased wastage.

7.2. Farm scale sediment and phosphorus losses

CVP includes cultivation which can cause losses of sediment and phosphorus. Sediment loss is primarily driven by slope, and most CVP occurs on flat land. Unmitigated erosion rates from flat cultivated land are less than erosion rates from pastoral rolling and hill country. Even on sloping land, CVP treated with sediment ponds has lesser erosion rates than pastoral farming on hill country.[46]

7.2.1. HOROWHENUA

In 2019, as part of the evidence for the Plan Change 2 hearing,[47] sediment modelling using the Don't Muddy the Waters tool was undertaken to predict the effectiveness of the uptake of erosion and sediment control plans as part of the adoption of the NZGAP EMS.

The sediment load reduction factors for current practices were collected through the completed farm plans. This included the use of erosion control measures such as cover crops and wheel track ripping.

Current sediment control was based on a satellite imagery assessment of the existence of vegetated buffer strips. Where they were present their effectiveness was modelled at both 80% (high) and 20% (low) efficiency. The biggest impediment to their effectiveness is channelising.

The analysis concluded that current erosion and sediment control practices reduce average sediment loss by between 34% (low efficiency) and 55% (high efficiency) compared to the unmitigated sediment loss rate. The potential enhanced practice achieves a 74% reduction in sediment. The estimated unmitigated sediment loss rate was 0.85t/ha/yr, the current practice was 0.56 – 0.36 t/h/yr and the potential rate was 0.22 t/ha/yr.

The improvements in erosion and sediment control represent that, over time, there is a combination of more mitigations being implemented and that both existing and new mitigations are delivered more effectively (primarily less channelising).

7.2.2. PUKEKOHE

In 2023, sediment modelling was undertaken using the Don't Muddy the Waters tool for Auckland Council and HortNZ. Improved sediment control consists of vegetated buffer strips, sediment retention ponds and wheel track ripping. The modelling found that for low slope, the improved sediment control mitigation reduced annual profit by 12%, annual

[46] Easton, S. 2019. PC1 Block 3 hearing. (table 6). Accessed 30 July 2024.
[47] Barber, A. 2020. PC2 Horizons Council Hearing. Accessed 30 July 2024.

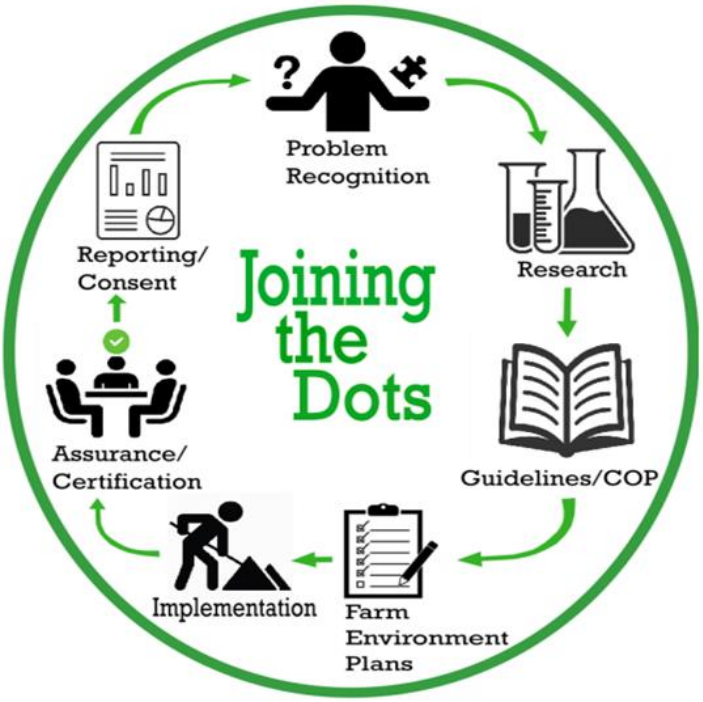
phosphorus yield by 63% and annual sediment yield by 61%. The improved sediment control mitigation combined with wheel track ripping reduced profit by 19%, phosphorus yield by 68% and sediment yield by 67%. For high slope, the improved sediment control mitigation reduced profit by 5%, phosphorus yield by 68% and sediment yield by 67%. The improved sediment control mitigation combined with wheel track ripping reduced profit by 12%, phosphorus yield by 76% and sediment yield by 27%. There was also a capital cost associated with all the above sediment control mitigations.

7.3. Farm scale pathogen losses

Most CVP rotations include no stock within rotations. Some CVP rotations include grazing of sheep on vegetable residue post-harvest, and some include a grazed pasture phase. This pasture phase may or may not be part of the CVP farming operation (i.e. the pasture phase is not always owned or leased by the CVP grower). Due to the importance of maintaining soil health, light stock and low stocking numbers are included within CVP rotations. The losses of *E. coli* from CVP are much lower than pastoral farming activities. In Waikato, for example, *E. coli* losses from CVP were estimated at 6% of *E. coli* losses from sheep and beef hill country farming.[48]

8. Managing Localised Environmental Effects of CVP

The industry has a systems approach to managing risks to freshwater from CVP farming practices that integrates research, good practice, farm planning, assurance and reporting. This integrated approach is supported by an industry framework, known as "Joining the dots", illustrated in the graphic below.



[48] Semadeni-Davies, A. et al. September 2015. Modelling E. coli in the Waikato and Waipa River Catchments: Development of a catchment-scale microbial model. Waikato Regional Council Technical Report 2018/62.

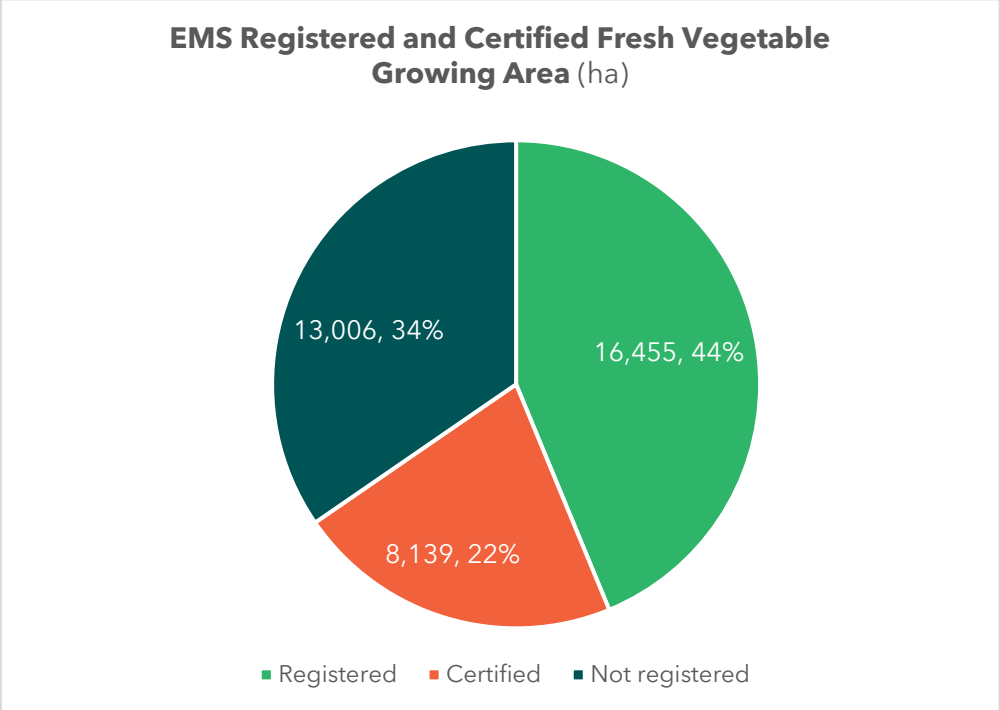
8.1. Industry assurance - GAP programmes

Good Agricultural Practice (GAP) schemes provide assurance for the safe and sustainable production, packing and distribution of fruits and vegetables in New Zealand. Horticulture businesses who achieve compliance with GAP assurance standards demonstrate that management systems, procedures and practices are in place to meet relevant regulatory and market requirements – so customers can buy with confidence. The two schemes operational in New Zealand are New Zealand GAP (NZGAP, owned by Horticulture New Zealand) and GLOBALG.A.P. (based in Cologne, Germany).

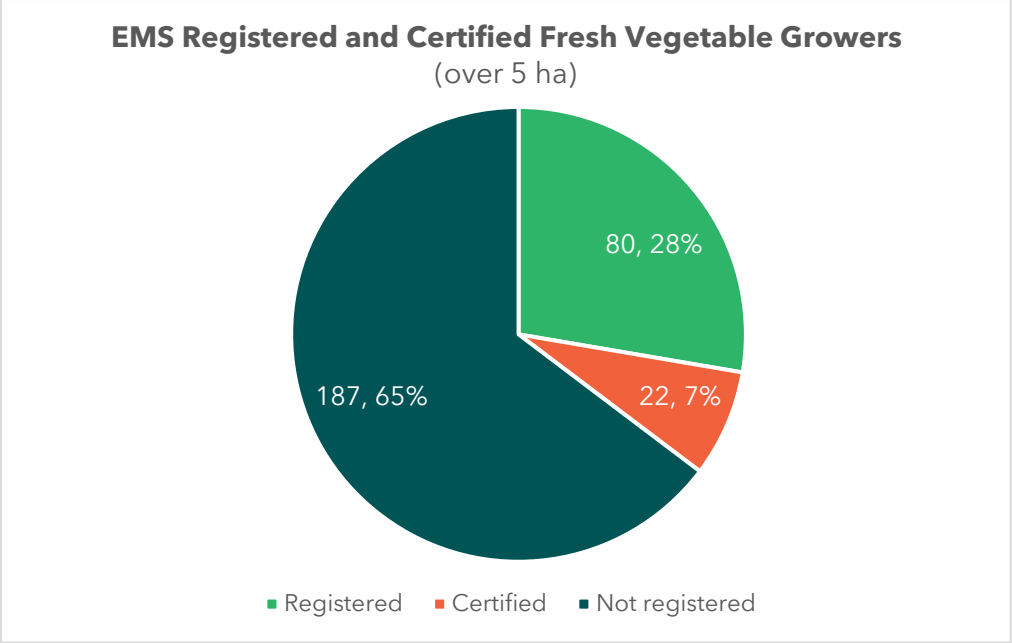
All GAP certified operators are independently audited by certification bodies (e.g. AsureQuality, SGS) who are accredited (e.g. by JAS-ANZ) against ISO standards to undertake assessment and certification activities. Growers must continuously meet requirements of GAP standards to maintain certification. GAP standards are benchmarked to relevant Regulatory and Market requirements so that GAP certification can be accepted as a pathway for growers to demonstrate compliance with those requirements (e.g. Food Safety, Environment, Social Practice).

8.1.1. FRESHWATER FARM PLANS

CVP has very high rates of adoption of the NZGAP Environmental Management System (EMS) add-on. 66% of CVP by area is registered with the scheme, representing 35% of GAP registered fresh vegetable growers operating on over 5 ha.[49] Our expectation is that the Freshwater Farm Plan regulations will be designed to provide for industry assurance programmes such as GAP to deliver freshwater farm plans.



[49] NZGAP, July 2024



The NZGAP EMS is a robust risk-based farm environment planning system. The EMS standard draws on industry research and codes of practice with farm plans certified based on independent research.[50]

The NZGAP EMS takes good and best management practices from industry-developed guidelines and codes of practice. These have been built upon years of Crown Research Institute and grower research and practice.

The NZGAP EMS has management areas with the following sub-sections: (a) Property Plan, (b) Soil; (c) Nutrients; (d) Water and Irrigation; and (e) Mahinga Kai and Biodiversity.

The EMS was developed and refined over the past few years. One of the biggest benefits is that it documents the timeline for the implementation of GMPs and BMPs. It collates the suite of practices, and if a practice is not being used, it requires a justification for a no response or a timeframe for its implementation. Likewise, growers must provide evidence where practices are being used. NZGAP can report on the current level of BMPs and GMPs, as well as planned actions over the next 5 years.

The EMS standard can be updated to reflect regulatory requirements. Currently, the EMS is recognised in Canterbury and Gisborne, and regional guides have been developed where the core EMS standard is supplemented with specific regional requirements.

While most CVP growers are registered with the NZGAP EMS and have developed action plans, not all actions have been fully implemented. Water quality discharges from vegetable production will improve as these plans are fully implemented over the next 5-10 years.

While the NZGAP EMS has very high rates of adoption, it is a voluntary add- on because it is not a market requirement. Some growers have other Farm Environment Plans, such as those

[50] The NZGAP EMS Add-on Implementation Guideline (V1.3 Jan 2019) is provided in Appendix B.

that operate as part of irrigation schemes. In our view, there should be flexibility for growers to adopt whichever farm planning tool works for them and meets regulatory requirements, but the NZGAP EMS should achieve regulatory equivalence for delivering Freshwater Farm Plans to provide growers with an efficient and integrated option or meeting their market and regulatory requirements.

8.2. Research, codes of practice and extension

8.2.1. NUTRIENT RESEARCH AND CODE OF PRACTICE

In July 2020, MPI and the vegetable industry (Potatoes NZ, Vegetables NZ, Vegetable Research and Innovation, and HortNZ) began the Sustainable Vegetable Systems (SVS) project that ran through to June 2024.

SVS takes a whole system, rather than crop-specific approach. This is because the performance of a crop is impacted upon by the practices prior (i.e. the previous crop or fallow period) and decisions on future crops may mitigate the effects of a current crop.

To achieve its primary outcome, SVS developed a nitrogen fertiliser decision support tool, N-Sight.[51] N-Sight turns the invisible visible, through modelling crop nitrogen uptake and soil mineral levels. In the tool these dynamic changes are graphically displayed as both changes over time and in a nitrogen, budget consisting of inputs and outputs.

The tool has three levels, with entry level requiring just four inputs: location, crop type, planting and harvest dates, and target yield. Using the best industry research and knowledge, fertiliser nitrogen guidance is outputted along with a budget and soil mineral nitrogen levels over the life of the crop.

Nitrogen budgeting is the most effective mitigation for reducing nutrient leaching. N-Sight provides a tool that is tailored to vegetable production. Growers have not previously had the tools to help them make very refined nutrient decisions, with the adoption of this tool we expect growers to be able to improve the efficiency of their nutrient use and reduce their losses.

The Code of practice for Nutrient Management[52] outlines good and best management practice. The 2014 code of practice for nutrient management is being updated to incorporate latest research and a 2024 version will be released this year.

8.2.2. SEDIMENT RESEARCH AND CODE OF PRACTICE

Don't Muddy the Water (2015-2019) was conducted to quantify the effectiveness of several sediment mitigation measures on cultivated horticultural land. The research was conducted by Agrilink NZ, NIWA, and Landcare Research. The primary focus was quantifying the effectiveness of Sediment Retention Ponds (SRPs) and vegetated buffer strips.

The most effective sediment reduction mitigation measure on flat cultivated land is well installed vegetated buffer strips. The assumptions and modelling behind this mitigation are included in the paper 'Factors and Assumptions Used in the Don't Muddy the Water Erosion

[51] Agrilink. "Sustainable Vegetable Systems (SVS)". Accessed 30 July 2024.
[52] HortNZ. August 2014. Code of Practice for Nutrient Management, Version 1.0. Accessed 30 July 2024.

and Sediment Rate Calculator'. 'Don't Muddy the Waters' built upon previous research on erosion control, including the use of cover crops and wheel track ripping and vegetated buffer strips.

This body of research over the past 25 years has either helped develop or later supported the Erosion & Sediment Control Guidelines for Vegetable Production[53]. The 2014 Erosion and Sediment Control code of practice is being updated to incorporate latest research and a 2024 version will be released this year.

A key tool developed as part of the Don't Muddy the Water project, and later refined through grower use and feedback, was the DMTW app.[54]

8.2.3. EXTENSION - GROWING CHANGE

The Growing Change project, a collaboration between Horticulture New Zealand and the Ministry for the Environment, is now entering its final year of a three-year initiative. The project aims to bolster the adoption of Good Agricultural Practice (GAP) Freshwater Farm Plans within the horticulture sector. By targeting educational outreach and extension services, the project seeks to improve water quality in catchment areas where commercial fruits and vegetables are grown. The project supports growers with technical workshops on nutrient, soil, and water management, and fosters peer learning via a network of specialist advisors, equipping growers with the knowledge to enhance farm practices and water sustainability.

Feedback from growers and product groups has been overwhelmingly positive, with many adopting proactive measures in environmental farm planning. This includes integrating the GAP assurance programme's EMS add-on, which aids in documenting mitigation strategies in a GAP-farm environment plan (FEP) to comply with Freshwater Farm Plans.

The project includes ten catchment regions, each supporting growers through a network of advisors and technical specialists. Notable successes include the closure of Waimea, Levin/Manawatu, and Ohakune catchments, with a significant increase of growers completing FEPs covering an approximate total of 5857 hectares of productive horticulture land, with an average of 8-fold increase of audit ready FEPs in completed regions. Two catchments, Pukekohe/Waikato and Otago/Southland are nearing completion, are showing high grower uptake. Selwyn catchment is ongoing with advisor support for the growers in developing FEPs, and the last four catchments Northland, Gisborne, Hawke's Bay and Kaituna are live from July 1, 2024. The Growing Change project is a testament to the grower's commitment to environmental stewardship and sustainable practices.

The training programme under development is another crucial component, aiming to educate growers, horticulture advisors, and auditors on managing freshwater risks. This micro-credential is co-designed in partnership with Muka Tangata, the Food and Fibre Workforce Development Council, and Te Pukenga Primary ITO, ensuring that the skills standards and learning outcomes are rooted in industry codes of practice.

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[53] Barber, A. June 2014. Erosion & Sediment Control Guidelines for Vegetable Production. Prepared for HortNZ.

[54] Vegetable Research + Innovation. "Erosion & Sediment Control". Accessed 30 July 2024.

9. Cumulative Water Quality Effects

Cumulative effects are those that occur at an international, national, regional, FMU, catchment and sub-catchment scale. These effects are a result of the total load of contaminants the receiving waters receive, and the ability of the receiving waters to assimilate these point and non-point discharges. At this scale of assessment, load received by the environment is the relevant metric for assessing the relative effect of activities. Load received by the receiving environment is the critical metric for assessing whether the policies and rule frameworks that set freshwater limits will achieve freshwater outcomes.[55]

CVP has an area of 50,000 ha in NZ. CVP has not expanded in New Zealand over the past 10 years and has likely contracted[56]. It contributes a very small proportion of the nutrient, sediment and pathogen load at a national level (much less than 1%). CVP also contributes a very small proportion of the contaminant load at a regional level, for example, in the Waikato River catchment the contribution of CVP to the nitrogen load is estimated to be 2.5% and less than 1% of phosphorus[57]. In the Horizons Region, CVP is estimated to contribute 0.7% of the nitrogen load, 0.4% of the phosphorus load and 0.5% of the pathogen load.[58]

Due to NZ's geographic isolation, it is not possible for New Zealand to import sufficient fresh vegetables to meet the NZ population's domestic nutritional needs.[59] There is a need for CVP to expand to keep up with population demand, but this expansion is off a small footprint and can be accommodated within environmental limits. For example, in the Waikato, the expansion of CVP predicted to occur to keep up with population over 10 years is 1877 ha, this would contribute 0.5% of nitrogen load of the Waikato. In evidence for Plan Change 1 it was explained that the 0.5% increase in the load would be accommodated within the reductions in load predicted to occur as a result of the application of good farming practice to CVP and other farming practices required in the Plan, so even within this 0.5% additional nitrogen load associated with new CVP the overall cumulative nitrogen load would be predicted to decrease and water quality to improve.[60].

There is an opportunity for CVP export crops (onions and process crops) to expand more that domestic population growth[61], but these crops are grown integrated with arable and pastoral farming in more extensive rotations, that have similar nitrogen leaching rates to pastoral farming.

A Plant and Food study[62] reviewed water quality management of CVP internationally and found that there are no silver-bullet practices and that most technologies and practices available internationally are in use in NZ. The importation of vegetables to meet domestic

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[55] Holmes, G. 13 October 2023. PC2 Evidence, paragraph 21. Accessed 30 July 2024.
[56] Approximately 50,000 Ha t 2013 and 40,000 Ha in 2023. United Fresh. "Fresh Facts 2023 – New Zealand's Fresh Fruit and Vegetable Industry". Accessed 30 July 2024.
[57] Holmes, G. 28 July 2023. PC 1 Environment Court Evidence. Accessed 30 July 2024.
[58] Holmes, G. 13 October 2023. PC2 Evidence. Accessed 30 July 2024.
[59] Agchain 2023 Sensitivity of Domestic Food Supply to Loss in Vegetable Growing Production in Specified Vegetable Growing Area. Report for MfE.
[60] Holmes, G. 28 July 2023. PC 1 Environment Court Evidence. Accessed 30 July 2024.
[61] Onions New Zealand Inc. "Facts and Figures". Accessed 30 July 2024.
[62] Thomas S, Trolove S, Fraser P, Langer S, van der Klei G, Michel A, Greer G, Gee M, Searle B, Hall M. June 2021. Options to mitigate nutrient leaching from commercial vegetable production. A Plant & Food Research report prepared for: Ministry for Primary Industries. Milestone No. 90617. Contract No. 39109. Job code: P/443082/01. PFR SPTS No. 21094.

demand, externalises the water quality impacts to receiving environments other countries. The adverse impacts on global ecosystem health may be higher if NZ imports vegetables from countries with lesser environmental standards than NZ. China is the country from which NZ imports most frozen vegetables[63]

CVP is frequently located in catchments with poor water quality. These catchments have poor water quality for a range of reasons. While CVP contributes to the water quality problems, it is often not the dominant contaminant source.[64] For example, there are only three catchments in NZ (all small catchments in the Pukekohe area) where commercial vegetable production is predicted to contribute more than 50% of the nitrogen load associated with diffuse discharges from farming activities. In most catchments, CVP makes up a small proportion of less 20% of the nitrogen load discharged to the receiving environment.[65]

9.1. Mitigations that improve the assimilative capacity of receiving waters

There are some catchments in NZ where reducing discharges and abstractions may not be able to achieve freshwater outcomes that meet the water quality bottom lines. This is because in some catchments the water quality state is not solely a consequence of abstractions and discharges. In some catchments the main driver of poor water quality may be due to fundamental changes to hydrology though land-drainage, river-engineering and imperviousness associated with urbanisation. Catchments where commercial vegetable production is located are usually not solely rural and often have highly modified hydrology. In these catchments achieving freshwater outcomes must integrate actions to address the effects of land drainage, flood protection and stormwater management as well as point source and rural diffuse discharges.

An example, Lake Horowhenua has poor water quality due to a range of factors: land drainage, imperviousness, historic discharges resulting the accumulation of nutrient rich sediments, exotic plant, fish and bird pests, diffuse discharges from surrounding rural land and stormwater discharges[66]. The Arawhata wetland in the Lake Horowhenua catchment is a catchment scale mitigation designed to reduce the contaminant load discharged to Lake Horowhenua. The wetland will also recreate part of Lake Horowhenua's lost wetland mosaic, changing the hydrology of the Arawhata to a healthier state.[67]

[63] Stats NZ. "Overseas merchandise trade datasets"; and Consumer. "Where's you food from?" Accessed 30 July 2024.
[64] In Lake Horowhenua catchment, CVP contributes 30% of the nitrogen load.
[65] Easton, S. 28 July 2023. PC1 Evidence. Waikato Environment Court; Holmes, G. 13 October 2023. PC2 Evidence; SLR 2024 Waimea Plains Groundwater Impacts
[66] NIWA. June 2011. Assessment of opportunities to address water quality issues in Lake Horowhenua. Prepared for Horizons Regional Council.
[67] Horizons Regional Council. "Arawhata Constructed Wetland Complex". Accessed 30 July 2024.

PART 7

Proposed Approach

CVP, like all farming activities, generates environmental effects and economic and social benefits. In the case of CVP, the economic and social benefits include nationally significant health benefits associated with the production of fresh vegetables for domestic supply. The nationally significant health benefits associated with CVP are a relevant consideration in the design of legislation and policy to manage the environmental effects of CVP.

10. Managing Environmental Effects of CVP while Achieving Freshwater Outcomes

The Specified Vegetable Growing Area (SVGA) exception set-up a trade-off between water quality outcomes and vegetable supply, this created unnecessary tension. Our preferred approach is one where commercial vegetable producers continue to operate, and freshwater outcomes are achieved. This approach is consistent with the vision that growers and iwi have agreed for Pukekohe:

> *Te Ora o te Wai: a healthy freshwater environment flowing within and from Pukekohe where its wellbeing is protected and enhanced while supplying fresh vegetables for the health and wellbeing of the peoples of Aotearoa/New Zealand.*[68]

11. Legislative and Policy Framework to Support CVP

We seek an amendment to the RMA that recognises that enabling the supply of fresh fruit and vegetables is a matter of national importance.

We seek amendments to the NPSFM that recognise that freshwater abstractions and discharges to support fresh fruit and vegetable production are a national freshwater value that should be considered in all FMUs.

We propose that the cumulative effects of commercial vegetable production are managed using the NPSFM framework to achieve freshwater outcomes. We seek changes to the NPSFM that replace the quashed SVGA policy, with policy to support the use of an action plan approach to supplement nitrogen limits in some catchments, with the purpose of achieving freshwater outcomes.

We propose that the localised effects of commercial vegetable production are managed though freshwater farm plans. We seek changes to the RMA and FWFP regulations to ensure the FWFP approach is both robust and efficient.

We seek national rules for vegetable production, that over-ride regional rules. This could be achieved either as an RMA amendment, an addition to the NES Freshwater or as a stand-alone NES Commercial Vegetable Production.

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[68] "Pukekohe Integrated Catchment Management Plan Process: Te Roopuu Mahia te Mahi/Working Group, Kawenata". 6 December 2012.

There is urgency in addressing this issue, due to the unworkable rules for vegetable production that currently threaten vegetable production in Waikato and Manawatu-Whanganui Regions.

12. RMA Amendments

As part of the RMA amendment process HortNZ is making submissions on the RMA reform. The changes summarised in this document, are changes specifically aimed at supporting a planning regime that will provide for commercial vegetable production.

12.1. Matters of national importance

We seek that vegetable production is afforded priority in resource management decisions because of its national importance. We seek policy support for this priority in the RMA Section 7.

Enabling the supply of the fresh fruit and vegetables was provided in the Natural and Built Environment Act. When this legislation was repealed, this important signal for considering the national importance of the supply of fresh fruit and vegetables in national direction was lost, and we seek that the RMA is amended to reinstate this matter.

The proposed changes to the RMA are provided in Appendix 1, Table 1

12.2. Diffuse discharge rules

Recent court decisions regarding discharges have pressing implications for horticulture in New Zealand. These issues pose threats to future consenting and operation of horticultural activities, which will have negative consequences for national food security, the economy, exports and the environment.

Prior to these decisions, and since the advent of the RMA in 1991, S70 and 107 were not considered to apply to diffuse discharges.

The Southland Decision means that future regional plans may not be able to authorise a discharge as a permitted activity;[69] therefore, horticultural activities may be required to apply for a discharge consent.

The Canterbury Decision means it will not be possible for horticultural operations to obtain resource consent for their diffuse discharges where one or more attributes of the waterway are below national bottom lines or minimum acceptable states.[70]

This is the first time since 1991 that such a requirement has been imposed. Without changes, future (and existing unconsented) horticultural activities in degraded catchments will not be able to gain discharge consent and will not be enabled to operate lawfully. If this outcome were to occur the vegetable supply for New Zealand would be severely reduced.

[69] Southland Decision at [90].
[70] Canterbury Decision at [76]-[79].

HortNZ requests immediate changes to the Act to ensure horticultural activities have a viable consenting pathway for diffuse discharge consents; and amending S107 to enable grant of discharge permits for horticulture.

The proposed changes to the RMA are provided in Appendix 1, Table 1

12.3. Freshwater farm plans

The changes we seek to the RMA and Freshwater Farm Plan Regulations are to allow full recognition of industry assurance programmes such as GAP. GAP systems are aligned with international practice for assurance, the independence of the GAP assurance processes exceed the assurance processes currently within the FWFP legislation and regulations.

If a National Environment Standard establishes a permitted activity standard, whereby commercial vegetable production is permitted with a FWFP, and the NZGAP EMS is recognised, then industry will be able support vegetable growers to rapidly update their EMS plans to meet the FWFP and NES requirements. NZGAP will be able to provide annual reporting to Councils on vegetable growers that are meeting the permitted activity standard to support Council's freshwater accounting and enforcement functions.

Growers farming over 66% of the CVP area in NZ are already registered with the NZGAP EMS. Making the changes required to enable full recognition of the EMS FWFP standard and the NZGAP assurance process is a very efficient method of implementing freshwater farm plans for CVP.

The proposed changes to the RMA are provided in Appendix 1, Table 1, and to the Freshwater Farm Plan Regulations and Ministers Standard are provided in Appendix 1, Table 2.

13. National Policy Statement for Freshwater Management

There are number of changes that we consider could be made to the NPSFM. The changes discussed below are only those changes we seek specific to enabling vegetable production.

13.1. Definition of Te Mana o Te Wai

We consider the principles of Manaakitanga and Care and Respect and the second obligation in the Te Mana o te Wai hierarchy support resource management decisions that consider and provide for vegetable production because of the national importance of a resilient supply of vegetables in supporting the nutritional health needs of the New Zealand population.

We consider the way the Te Mana o Te Wai is being interpreted by Regional Councils is problematic. We support the recent proposed RMA amendment that clarifies that Te mana o te Wai should not be considered in consenting. We think that the concept of Te Mana o te Wai has value in guiding freshwater policy. We are still consulting growers on this issue and will provide further comments on submissions on the review of the NPSFM, but in the first instance, we consider a modification to the definition of Te Mana o te Wai would support more integrated decision making.

The proposed wording is provided in Appendix 1, Table 3

13.2. Compulsory freshwater values

One of the weaknesses of the NPSFM currently is that none of the freshwater use values are compulsory, we've seen use values effectively ignored by some regional councils.[71]

Another weakness is that all of the freshwater use values are focused on the value of freshwater in supporting abstractions, but none are focused on the value of freshwater catchments in assimilating discharges.

A compulsory national freshwater value that enables the supply of fresh fruit and vegetables should be added to Appendix 1A. There should also be a compulsory value to provide for reliable abstractions and to ensure sufficient capacity to assimilate discharges.

The proposed working is provided in Appendix 1, Table 3

13.3. Quashed Specified Vegetable Growing Area

The SVGA was a transitional policy. Our expectation was the policy would support a more enabling policy framework for vegetable production under the NPSFM 2020, than had been the case in the plans that had implemented the NPS FM 2014 and that with the NPSFM 2020 plans being notified in 2025, there would be limited risk to the sector from the NPSFM 2014 plan changes, as these would be immediately superseded by the NPSFM 2020 plan changes.

In the longer term, our expectation was that allocation policy direction or an enabling NES for commercial vegetable production would be developed, which would manage the risk of the NPSFM driving land-use change away from nationally important activities such as commercial vegetable production.

The inclusion of the requirement in the now repealed Natural and Built Environment Act that the National Planning Framework *"must provide direction on enabling the supply of fresh fruit and vegetables*", was a clear signal that enabling national direction such as an enabling NES would be provided as the longer-term policy instrument for commercial vegetable production.

13.3.1. LIMITED UTILITY OF THE CURRENT SVGA DRAFTING

With the extension of the timeframe of the NPS 2020 to 2027, the utility of the SVGA policy as it was framed is reduced. The regulatory problems currently threatening commercial vegetable production are too severe to wait to be addressed in the 2027 NPSFM plan changes.

The NES signalled in the quashed SVGA needs to be implemented urgently ahead of the 2027 NPSFM plan changes.

[71] Horizons Regional Council. September 2023. Review of compatibility of Horizons One Plan targets with attributes and limits of the National Policy Statement for Freshwater Management.

13.3.2. A REFOCUSED VEGETABLE GROWING EXCEPTION POLICY

One of the weaknesses of the SVGA is that it creates a tension between the value of domestic food supply and the value of ecosystem health and gave the erroneous impression to communities and Councils that commercial vegetable production was the sole or primary cause of water quality issues within Horowhenua and Pukekohe.

CVP is frequently located in catchments with poor water quality. These catchments have poor water quality for a range of reasons. While CVP contributes to the water quality problems, it is often not the dominant contaminant source, for example in the Lake Horowhenua Catchment, the nitrogen load contributed by commercial vegetable production is 23% with 68% [72]of the load estimated to be contributed by pastoral farming In the Pukekohe SVGA, the overall nitrogen load from CVP is estimated to be 35%. There are only three catchments in NZ, the Whakapipi Stream in Waikato, Clarkes Creek and Mauku Stream in Auckland, where more than 50% of the nitrogen load is estimated to be from CVP.[73]

HortNZ viewed the SVGA policy as an acknowledgement that in some catchments, in some peri-urban and low-land catchments where commercial vegetable production is located, it is not possible to achieve NPSFM bottom lines without driving significant land use change. That is to achieve NPSFM bottom lines, activities including vegetable production and pastoral activities that are operating at good and best management practice would need to change to alternative land uses such as forestry, fruit production or low-intensity lifestyle.

A key reason why it may not be possible for bottom lines to be met in all catchments, is related to the size of catchments, used for assessing target attribute states. Horticulture is often located in small low energy catchments. In addition, the use of 'state of environment' monitoring sites for the NPSFM, has meant that catchments that are being used for freshwater planning purposes for horticulture are much smaller than for pastoral farming. The small catchment size provides much less flexibility within those catchments and means that the target attribute states cannot be meaningfully compared, for example in the Waikato Plan Changes freshwater limits were at the sub-catchment scale, but the catchments vary in size from very small in Hamilton and Pukekohe, to very large in the upper Waikato.

We seek a re-focus on the SVGA, that drives integrated long-term action at the farm and catchment scale. We propose an action plan approach in addition to freshwater limits for diffuse discharges is adopted for catchments that support commercial vegetable production and are below the national bottom lines for nitrogen attributes and where analysis indicates it is unlikely that a limit-based approach focused on the adoption of economically viable good and best management practices, and without driving land use change, would achieve bottom lines within 30 years. Analysis has indicated that it is very unlikely that bottom lines can be met in Pukekohe and Horowhenua without widespread land use change[74], this is also true for other catchments important for vegetable production in the North and South Islands.

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[72] Agchain 2023 Sensitivity of Domestic Food Supply to Loss in Vegetable Growing Production in Specified Vegetable Growing Area. Report for MfE.

[73] Easton, S. 18 February 2021. Land use and N load estimates – Pukekohe and Horowhenua. Jacobs.

[74] Agchain 2023 Sensitivity of Domestic Food Supply to Loss in Vegetable Growing Production in Specified Vegetable Growing Area. Report for MfE.

We consider that operating within vulnerable catchments that are important for vegetable production should warrant an Action Plan approach that includes spatial planning for long-term land use. Land use change may be an option in the catchments, and including away from outdoor vegetable production, however we seek that land use change away from outdoor vegetable production is only planned for if there is also planning to enable the production from outdoor vegetables to be replaced elsewhere. Even with an NES for vegetables that made new vegetable production permitted, existing locations likely provide specific growing conditions that are rare, and may not easily be replicated elsewhere, for example the Ranzu soils on the Waimea Plains are warm and support horticultural production in winter in the South Island, when most other locations are too cool. While land use change on the Waimea away from vegetable production towards apples, wine grapes or lifestyle housing might make achieving freshwater outcomes more attainable, this land use change should not be driven by NPSFM freshwater limits, without consideration of how the loss of vegetable production on these soils, would impact on the resilience of the supply of fresh vegetables to the South Island in winter.

It should be acknowledged that the location of these catchments, the size of the land parcels and the value of the land means that land use change driven by freshwater limits is likely to be towards urban and lifestyle development. In addition to the land use element of spatial planning, these catchments require an integrated approach to catchment scale mitigation devices and infrastructure.

The proposed wording is provided in Appendix 1, Table 3

14. Nationally Consistent Rules

We seek nationally consistent rules where existing and new commercial vegetable production is a permitted activity, subject to a permitted activity standard. We seek national rules that over-ride regional rules, so are applied consistently across New Zealand. These rules would not override existing consents that some CVP growers already have.

An approach where consents are required for CVP (including for expansion and or in the catchments with nitrogen attributes below the bottom lines), is unlikely to be effective. Significant reductions in nitrogen losses from CVP (beyond GMP through farm plans) cannot be achieved without reducing vegetable production, and domestic vegetable production cannot be sufficiently replaced with imported produce. [75] The gross margins for CVP are such that it cannot support a reduction in marketable crop yield.[76] Consents are not required to drive the uptake of good and best management practice, because Freshwater Farm Plans are a better tool for that purpose. Additional measures such as farm-level offset, which is a consenting requirement for expansion in some plans, is not economically possible for vegetable production.[77]

In addition, consenting vegetable production has proven very challenging due to the structure of the land use consents which run with the land, which create administrative complexity for an activity which changes locations. We accept that for compliance and

[75] Agchain 2023 Sensitivity of Domestic Food Supply to Loss in Vegetable Growing Production in Specified Vegetable Growing Area. Report for MfE.
[76] PerrinAg 2023: Horticulture Typology Modelling for the FWMT prepared for Auckland Council and HortNZ
[77] Ford, S. 2019. Memorandum to HortNZ. Accessed 30 July 2024.

freshwater accounting purposes regulators need to know where commercial vegetable growing is occurring, but this can be achieved through freshwater farm plans.

For catchments that are below the bottom lines for nitrogen attributes, the freshwater farm plan requirement to account for catchment context will drive growers to prioritise reducing nitrogen losses as much as possible. In addition, in these catchments, we recommend an approach that requires growers to document how they are participating in catchment action (for example, contributing to future phases of the Arawhata Wetland in the Horowhenua[78]), or catchment research (for example, participating in Te Ahikawariki Vegetable Centre of Excellence in Pukekohe), or participating in extension activities, (for example, studying for the water quality management micro credentials developed as part of the Growing Change project[79]). This approach creates an incentive for growers to operate in catchments with lesser water quality pressure, but better acknowledges that those catchments where vegetable production is currently located are likely to remain important for future vegetable production and will require additional effort to achieve freshwater outcomes.

In vulnerable catchments that are important for commercial vegetable production, it should not only be vegetable growers that participate in catchment action. These catchments often have complex water quality issues that are related to pressures associated with other activities, including historic activities and permanently changed hydrology. To address the need for an integrated catchment approach, we have also proposed changes to the NPSFM to provide for an Action Plan approach described in section 3.15.

CVP has lesser environmental risks than intensive winter grazing and is less than one quarter of the scale compared with intensive winter grazing nationally.[80] The effects of intensive winter grazing are managed as a permitted activity with a FWFP under the NES Freshwater. The localised effects of CVP can be managed with a FWFP, without causing significant adverse environmental effects.

14.1. National Environmental Standard – Preferred Option 1

An NES for commercial vegetable production could be progressed as a standalone NES or, as it is related to discharges, it would be appropriate to include it as an amendment to the NES Freshwater.

The NES Commercial Vegetable Production provisions must differ from the other provisions within the NES Freshwater, which set a minimum standard that Regional Councils can choose to adopt or apply more stringent rules.

In the case of Commercial Vegetable Production, the NES provisions must prevail over all Regional Council rules, so they set the national standard that must not be made either more or less stringent at the Regional Council level.

The proposed working is provided in Table 4 Appendix 1

[78] MfE. 30 June 2023. "Arawhata Wetland Project". Accessed 30 July 2024.
[79] HortNZ. "Freshwater Farm Plans". Accessed 30 July 2024.
[80] 222,697 ha of intensively grazed forage nationwide in 2021. This compares with an estimate of 40,000 ha of CVP. National winter forage – intensive winter grazing map for winter 2021. Manaaki Whenua Landcare Research; United Fresh. "Fresh Facts 2023 – New Zealand's Fresh Fruit and Vegetable Industry". Accessed 30 July 2024.

15. Alternative Framework

The issues facing CVP are severe and immediate, and the policy support is required urgently. The most significant issue is related to the policy framework associated with discharges, and therefore we have developed proposed amendments to the wholistic freshwater framework – FWFP, the NPSFM and the NES Freshwater.

An alternative approach would be to develop a more comprehensive National Policy Statement (NPS) for Horticulture, that responds to the national importance of the activity, and a short-term RMA amendment to make CVP a permitted activity, while the replacement to the RMA is being developed and until the NPS Horticulture can be implemented at the local level.

15.1. National Policy Statement for Horticulture

Enabling the supply of fresh fruit and vegetables is a matter of national importance because of its importance to human health, and as a high-value low-emissions primary production activity. The importance of horticulture warrants a standalone NPS to support Regional Policy Statements, Regional Plans and District Plans to ensure the overall planning framework is enabling.

An NPS Horticulture is consistent with the focus of the National Party Primary Sector Growth Plan, which is focused on unworkable regulation for fruit and vegetables, and the negative impact that can have on the price of healthy food for New Zealanders.

The fruit sector is less impacted by freshwater quality regulations than CVP, because fruit production is a relatively low impact activity. Fruit growing shares many other regulatory concerns, however, relating to water allocation, air, noise, amenity and reverse sensitivity.

We have reviewed the NPS Renewable Electricity Generation, and consider it provides a good framework for an NPS Horticulture and have used that as the initial basis for the proposed drafting.

If an NPS Horticulture was progressed in the short-term, it would still need to be supported by a transitional RMA amendment to make CVP a permitted activity, until the NPS Horticulture was either supported by an NES, or was implemented though the next round of regional and district plans.

The proposed wording is provided in Appendix 1, Table 5.

15.2. Nationally Consistent Rule via an RMA amendment

Nationally consistent rules for commercial vegetable production could be achieved with an amendment to the RMA. This approach would be the quickest way to achieve the outcome, and would be a transitional provision, in anticipation of a more comprehensive review of the RMA.

In a submission on the RMA amendments in April 2024,[81] HortNZ proposed amendments with slightly different wording to this amendment to the RMA. On reflection, we consider those criteria uncertain to include within an RMA amendment. Here, we have proposed simpler wording for an RMA amendment.

Due to the current threat from unworkable rules, it is critical that either an NES CVP or an RMA amendment to make nationally consistent rules that enable existing and new CVP as a permitted activity is progressed urgently.

The proposed wording is provided in Appendix 1, Table 6.

[81] Sands, M. 5 April 2024. "Submission on Targeted changes to the RMA". HortNZ.

PART 8

NES for CVP

This submission sets out the issue and the overarching policy framework that would provide a more workable regulatory framework for vegetable production.

The most critical and urgent element of the framework is an NES for CVP. An NES for CVP could be progressed as part of the NES freshwater.

In the case of CVP, the NES provisions must prevail over all Regional Council rules, so they set the national standard that must not be made either more or less stringent at the Regional Council level.

16. Industry Codes of Practice and Industry Assurance Schemes

The proposed NES relies on Freshwater Farm Plans, and in combination with the amendments HortNZ seeks to the Freshwater Farm Plan regulations, proposes that the NZGAP EMS would be recognized as an industry equivalent system for delivering the Freshwater Farm Plans.

The NZGAP EMS implementation guide is provided in Appendix B. This guide sets out the Standard against which growers are audited. The EMS also provides growers a template[82] to support assessing their current practices and develop action Plans. The GAP EMS draws on the Industry Codes of Practice, which in turn draw on research. The Don't Muddy the Waters and SVS research have been completed since the current codes of practice were developed, so the new Codes Practice will provide updated and more specific advice to growers on minimum expectations around crop budget, soil testing and the minim acceptable erosion and sediment control measures.

The industry codes of practice for nutrients and sediment are being updated in 2024. The EMS standard is also being updated in the 2024/25 financial year. The update of the EMS will reflect the Freshwater Farm Plan Regulations and Ministers standard and the updated Codes of Practice.

The updated EMS standard will set minimum standards for crop budgeting and erosion and sediment control that are more specific than the current EMS standards, for example, at this stage we would expect the minimum standards would include:

- Farm scale nutrient crop budget that accounts for plant uptake and nutrient supply, and is supported by a minimum of one soil nitrogen test per cultivated block per annum.
- 5m setbacks with a buffer strip from waterways or contouring such that water flows to a sediment treatment device rather than flowing into the water course via overland flow.

[82] NZGAP. "Environment Management System (EMS) Add-on". Accessed 30 July 2024.

- An irrigation scheduling plan that accounts for relevant factors (e.g. Plant growth phase / soil type / water holding capacity and climatic conditions.

17. Proposed Provisions

The provisions we seek are summarised in Table 4 Appendix 1 and provided below**.**

1x) A district rule, regional rule, or resource consent may not be more stringent nor more lenient than the regulations relating to commercial vegetable production. The CVP provisions shall prevail over regional rules.

Permitted activities.

The use of land and associated discharges, for commercial vegetable production under 5ha is a permitted activity, commercial vegetable production farm over 5 ha is a permitted if the activity complies with the following conditions:

Conditions

1) ***The condition is that the commercial vegetable growing farm over 5 ha must be undertaken in accordance with the farm's freshwater farm plan in accordance with RMA part 9A and the Freshwater Farm Plan must include the following minimum criteria:***
    a. ***The freshwater farm plan and associated action plan must include a risk assessment that considers:***
        i. ***The state of the freshwater receiving environment,***
        ii. ***The biophysical characteristics of the farm including soil, rainfall and slope.***
        iii. ***The practices associated with activity,***
2) ***The freshwater farm plan must:***
    a. ***demonstrate that the grower is adopting a risk-based approach to managing risks over time though implementation of the action plan.***
    b. ***In determining the appropriate actions to manage risk a grower must consider a range of good and best practices from industry codes of practice for nutrient, sediment and irrigation management.***
    c. ***The freshwater farm plan must be updated to reflect rotation or expansion in the following manner:***
        i. ***As land parcels change due to crop rotation or expansion, the freshwater farm plan risk assessment and action plan must be updated.***
        ii. ***The freshwater farm plan, must document the location of all parcels that are being used for commercial vegetable production, including cover crop and pasture phases, and the actions relevant to each parcel.***

Restricted Discretionary Activity:

1) The use of land and associated discharges, for commercial vegetable production is a restricted discretionary activity if the use does not comply with the applicable permitted activity conditions.

Matters to which discretion is restricted:

I. **Actions within the Freshwater Farm Plan to address the adverse effects, including cumulative effects, of discharges of nitrogen, phosphorus, sediment, and microbial pathogens to water.**
II. **Actions within the Freshwater Farm Plan to address any adverse effects on downstream drinking water supplies.**
III. **The duration of the resource consent.**
IV. **The monitoring, record keeping, reporting and information provision requirements of the holder of the resource consent to demonstrate and/or monitor compliance with the resource consent and Freshwater Farm Plan.**
V. **The timeframe and circumstances under which consent conditions may be reviewed.**

Interpretation:

Farm means a landholding whose activities include agriculture.

Landholding means 1 or more parcels of land (whether or not they are contiguous) that are managed as a single operation.

Agricultural activity means a farm where all or part of the farm is–
(a) arable land use; or
(b) horticultural land use; or
(c) pastoral land use; or
(d) other agricultural land use prescribed in regulations made under section 217M(1)(b) of Freshwater farm plans ;
or (e)any combination of the above

APPENDIX 1

Changes Sought to Support Commercial Vegetable Production

Without limiting the generality of the above, HortNZ seeks the following specific changes summarised in the four tables as outlined below:

- **Table 1 – Resource Management Act**
- **Table 2 – Freshwater Farm Plans Regulations and Ministers Standard**
- **Table 3 – National Policy Statement for Freshwater**
- **Table 4 - National Environment Standard Freshwater**.

We have also drafted an alternative approach, where an NPS for Horticulture is developed, and the rules to support the NPS are provided by an amendment to the RMA.

- **Table 5 – National Policy Statement for Horticulture**
- **Table 6 – Resource Management Act – specific commercial vegetable production provisions**

Table 1 – Resource Management Act

As part to of the RMA amendment process HortNZ is making submissions on the RMA reform. The changes summarised in this table, are a sub-set of the changes we have proposed to the RMA, these changes are those specifically aimed to support developing a planning regime that will provide for commercial vegetable production.

Provision	Reason	Decision sought
6 Matters of national importance	The purpose of the NPS-HPL is to prioritise primary production on highly productive land. Protection of highly productive land should be a matter of national importance under Clause 6 of the RMA because productive soils are a limited resource of strategic importance for New Zealand's food production.	6 Matters of national importance In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall recognise and provide for the following matters of national importance: (a) the preservation of the natural character of the coastal environment… (b) the protection of outstanding natural features and landscapes… **(bb) the protection of highly productive land for use in primary production, both now and for future generations:** (c) the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna…
7 Other matters	Fresh fruit and vegetables are nationally significant for the health of the nation, for domestic nutrition and food security and for export value as low emissions, high value products.	7 Other matters In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of

	As such, the supply of fresh fruits and vegetables should be enabled as a matter that all RMA practitioners should have particular regard to under Section 7 of the Resource Management Act 1991 (RMA).	natural and physical resources, shall have particular regard to– (a) kaitiakitanga… (ba) the efficiency of the end use of energy: **(bb) the supply of fresh fruits and vegetables** (c) the maintenance and enhancement of amenity values…
RMA 70 Rules about discharges	Recent court decisions regarding discharges have pressing implications for horticulture in New Zealand. These issues pose threats to future consenting and operation of horticultural activities, which will have negative consequences for national food security, the economy, exports and the environment. This is discussed further under Section 5. Discharges of this submission.	(1) Before a regional council includes in a regional plan a rule that allows as a permitted activity… (2) Before a regional council includes in a regional plan a rule requiring the adoption of the best practicable option… **(3) This section shall only apply to a point source discharge.** **(4) For the purposes of this section, point source discharge means a discharge from an identifiable and confined point but excludes:** **(a) any discharge of contaminants intended to be disposed of onto or into land, such as disposal of stormwater to ground, irrigation of effluent or wastewater, application of fertiliser, or critical source areas;** **(b) the discharge of contaminants from or caused by animals;** **(c) any discharge of contaminants from or caused by horticulture.**

RMA 107 Restriction on grant of certain discharge permits	Recent court decisions regarding discharges have pressing implications for horticulture in New Zealand. These issues pose threats to future consenting and operation of horticultural activities, which will have negative consequences for national food security, the economy, exports and the environment.	107 Restriction on grant of certain discharge permits (2) A consent authority may grant a discharge permit or a coastal permit to do something that would otherwise contravene section 15 or section 15A that may allow any of the effects described in subsection (1) if it is satisfied— (a) that exceptional circumstances justify the granting of the permit; or (b) that the discharge is of a temporary nature; or (c) that the discharge is associated with necessary maintenance work**; or** **(d) that any of the effects identified in subsection (1) above is only likely to arise because of a cumulative effect of the discharge in combination with other discharges and that the discharge permit includes conditions requiring any contribution of the discharge to that cumulative effect to be managed over time—** and that it is consistent with the purpose of this Act to do so.
Part 9A Freshwater Farm Plans 217B **217B Interpretation** **Definition of Certifier and Auditor**	We seek a process for the approval of auditors and certifiers that are employees of approved organisations. This would mean that all auditors that are employed as auditors of a conformity assessment body and	217B Interpretation auditor means a person who— a. is appointed under section 217K; ~~and~~ **or**

	accredited certification bodies would be able to be approved as auditors and certifiers. This approach is consistent with the ISO approach and would be more efficient for GAP, which operates an assurance in manner consistent with the ISO framework.	b. **is employed or contracted by an approved industry organisation under Section 217KA; and** c. meets the criteria prescribed in regulations made under section 217M(1)(h) certifier means a person who– a. is appointed under section 217K; ~~and~~ **or** b. **is employed or contracted by an approved industry organisation under Section 217KA; and** meets the criteria prescribed in regulations made under section 217M(1)(h)
Part 9A Freshwater Farm Plans 217KA **217KA Regional council may approve industry organisation to provide certification or audit services**	Greater flexibility is needed in the way that industry organisations can be approved, such that organisations that operate nationally can apply for national recognition against Ministerial Standards, and regional councils must accept programmes that have been nationally approved.	**Proposed amendment to the RMA Part 9A Freshwater Farm Plans 217KA** 217KA Regional council may approve industry organisation to provide certification or audit services **Approval of** ~~Regional council may approve~~ industry organisation to provide certification or audit services. (1) A **national body under the Ministry for the Environment, or a** regional council may give approval to an industry organisation that applies to the council to provide certification and audit services under this Part if the council is satisfied that the organisation meets the standards issued under subsection (2) (1a) **An industry organisation, if operating nationally on behalf of its members, may apply for national recognition under the national body. A Regional**

		<u>Council must accept the national body approval of that industry organisations to operate in their region.</u> (2) The Minister may, by notice in the Gazette, issue standards by which industry organisations must be assessed for the purpose of determining their suitability to be an approved industry organisation… (3) Standards may also– (a)set out the kind of organisation eligible to be approved for the purposes of this Part; and (b)include content and processes to provide for compliance with the standards, for example, by requiring the industry to run training programmes and ensuring that conflicts are appropriately managed. **(c) set nationally consistent reporting requirements stipulating reporting required to reasonably carry out regional council functions under 217I** (4) A regional council may **<u>only</u>** request information from an approved industry organisation **<u>that is outlined in the standard as</u>** ~~the council considers~~ reasonably necessary for carrying out their functions under section 217I

Table 2 Freshwater Farm Plans

We propose that the permitted activity standard for commercial vegetable production would be achieved via the Freshwater Farm Plan system. The changes we propose are to better enable full recognition of the GAP programmes. If the GAP programmes are fully supported, then industry will be able to update the NZGAP EMS to the permitted activity standard and support growers to meet the standard.

Provision	Reason	Decision sought
Resource Management (Freshwater Farm Plans) Regulations 2023, **3 Interpretation** **Critical Source Area**	The definition of the critical source area within the FWFP regulations currently cross references the critical source areas definition in the NES Freshwater. With the proposed amendment in NES freshwater removing this definition there is a need for this definition to be expressed in the FWFP regulations. While the proposal is simply to copy the existing definition, there is an opportunity to improve the definition. Currently the definition is being interpreted very broadly. For example, Waikato Regional Council defines all cultivation at a Critical Source Area, which is not sensible. There may be critical source areas concentrating flow at the downstream end of cultivated fields, but to define all cultivation as a critical source area undermines the purpose of the definition. 6374-HRWO-critical-source-areas.pdf (waikatoregion.govt.nz)	**critical source area** means a landscape feature such as a gully, swale, or depression that– (a)accumulates runoff from adjacent land **such that runoff is concentrated in a single flow path**; and (b)delivers, or has the potential to deliver, 1 or more contaminants to 1 or more rivers, lakes, wetlands, or drains, or their beds (regardless of whether there is any water in them at the time

Ministers Standard **Interpretation: *Certification*.**	ISO/IEC 17000:2020 (E) is the International Standard for Conformity Assessment – Vocabulary and General Principles. HortNZ seeks that there is alignment through an alternative path for IAP schemes that deliver assurance aligned with international practice. The definition of certification in ISO/IEC 17000:2020 (E) is as follows: Certification: third-party *attestation* (7.3) related to an *object of conformity assessment* (4.2), with the exception of *accreditation* (7.7)	*Certification* means the process of ensuring that the content and implementation of the Freshwater Farm Plan is checked for consistency with Part 2 of the Resource Management (Freshwater Farm Plans) Regulations 2023 **or has the meaning in ISO/IEC 17000:2020 (E)**
Ministers Standard: **New Clause** **Approval of ISO accredited IAPs**	For the equivalence approval pathway for industry assurance programmes operating under an ISO accredited framework, there should be a simpler approach outlined in the Minister's Standard.	Include the words: **Regional Councils, or a national oversight body within Ministry for the Environment, may approve industry organisations to deliver audit and certification services where the programme (FWFP content and/or process for audit and/or process for certification) is ISO accredited (e.g. by JAS-ANZ) as achieving the purpose of Part 9A.**

Minister Standard **Programme User and Programme Reporting Requirements**	The Ministers standard should be clear about the reporting requirements, and these should be nationally standardised. It is inefficient for every regional council to have discretion to decide what is reasonably required. What is reasonably required should be stipulated in the Ministers Standard.	Strike-out: ~~A Programme must make available to the Regional Council, within 20 working days, any information that is reasonably required by a regional council enforcement officer, for the purpose of monitoring Programme compliance with Part 9A of the Act, the Resource Management (Freshwater Farm Plans) Regulations, and the Standard~~.
Minister Standard **Application Assessment & Approval, Review and Revocation**	It should be made clear that an IAP can demonstrate it meets the ministers Standard, via approval of a national approval body. Currently the Ministers Standard envisages that the application is made to each Regional Council and that Councils 'will work together" This is unacceptable to HortNZ and the GAP programmes. There MUST be a national approval process, that all regional councils abide by.	Include the words: **"Regional Council or National approval body"** **Include the criteria: where a programme has been approved by the national approval process the regional council must grant the programme full approval status**

Table 3 – National Policy Statement for Freshwater

HortNZ will submit on proposed changes to the NPSFM. The changes proposed below are specifically related to providing the policy support for commercial vegetable production.

Provision	Reason	Decision sought
Preliminary Provisions 1.3 Fundamental concept of Te Mana o Te Wai	The TMOTW principles and the hierarchy of obligations should be maintained but clarified to take a more holistic approach to balance and human health needs. This aligns with government priority to "rebalance Te Mana o te Wai to better reflect the interests of all water users"[83] and "Support the efficient allocation of freshwater"[84].	(1) Te Mana o te Wai is a concept that refers to the fundamental importance of water and recognises that protecting the health of freshwater protects the health and well-being of the wider environment. It protects the mauri of the wai. Te Mana o te Wai is about restoring and preserving the balance between the water, the wider environment, and the community**, having regard to the hierarchy of obligations and using an overall judgment approach.**
Interpretation Health Needs of People	Activities that support human health, including domestic food supply, should be prioritised. A holistic definition of "human health needs" will better encompass the wider factors that encompass the physical well-being of New Zealanders. The proposed definition below is based	**Health needs of people means underlying determinants of health, including:** • **Safe drinking water and adequate sanitation** • **Safe food** • **Adequate nutrition and housing** • **Healthy working and environmental conditions**

[83] coalition agreement between National and ACT
[84] "Blueprint for a Better Environment" policy

	on the Office of the United Nations High Commissioner for Human Rights (OHCHR) and the World Health Organisation (WHO) discussion on the right to health.[85] Many activities that are important for human health, such as vegetable production, are not without environmental effects, but a balanced approach should recognise the importance of food to human health needs for the nutrition and well-being of New Zealanders.	
Appendix 1 A Compulsory Values	Use value must be considered when setting freshwater outcomes and limits so a balanced approach can be achieved. In our view food production is a value that should be considered not only because of its economic contribution, but also because of its contribution to human health needs. The supply of fresh fruit and vegetables are particularly important for supporting human health needs.	**The FMU or part of the FMU enables the supply of fresh fruit and vegetables.** **Water quality and quantity provide for reliable abstractions for irrigation and frost protection, and water quality provides sufficient capacity to assimilate discharges.**

[85] https://www.ohchr.org/sites/default/files/Documents/Publications/Factsheet31.pdf

	The use value of freshwater must recognise the assimilative capacity of freshwater to support abstractions and discharges is a freshwater value, with both economic and human health benefits. Our expectation is that all values are provided for within the framework of the NPSFM, which requires freshwater outcomes to be achieved, with the health of freshwater prioritised, in accordance with NPSFM that sets the minimum requirements, i.e. maintain and bottom lines.	
3.33 Specified Vegetable Growing Area	The SVGA were quashed, but the decision did not question the national importance or health benefits of providing for commercial vegetable production.[86] Growers share community aspirations to achieve freshwater outcomes that at least meet bottom lines, and therefore seek provisions that are focused on the design of limits and	3.33 ~~Specified Vegetable Growing Area~~ **Commercial Vegetable Production** ~~This clause applies only to the 2specified vegetable growing areas identified in~~ ~~Part 1 of Appendix 5~~ (2) When implementing any part of this National Policy Statement as it applies to an FMU or part of an FMU that is in, or includes, ~~all or part of a specified~~ **commercial** vegetable ~~growing~~ **production** ~~area~~, a regional council must have regard to the importance of the **contribution**

[86] Muaupoko-Tribal-Authority-Inc-v-Minister-for-the-Environment-2023-NZCA-641.pdf (lawsociety.org.nz)

	actions rather than the exemption to the bottom line. The amendments we seek, require Regional Councils to provide for commercial vegetable production, but instead of providing an exemption to the bottom lines, the proposed wording provides an exemption to provision 13.4.(3), and instead of solely relying on limits provides for an Action Plan approach under provision 13.5, to be adopted in some vulnerable catchments that are important for commercial vegetable production.	**of commercial vegetable production** ~~the specified growing area~~ to: (a)the domestic supply of fresh vegetables; and (b) maintaining food security for New Zealanders. (3) Subclause (4) applies if ~~(a) an FMU or part of an FMU is adversely affected by vegetable growing in a specified vegetable growing area; and~~ (b) the baseline state of an attribute specified in Part 2 of Appendix 5 in the FMU or part of The FMU where all or part of **commercia**l ~~the specified~~ vegetable **production** ~~growing area~~ is located is below the national bottom line for the attribute; and (c) **implementing a solely limits-based approach to** achieving the national bottom line for the attribute would compromise the matters in subclause (2) (4) When this subclause applies, the regional council: **a) must set TAS at a minimum to achieve bottom lines** **b) must set limits for all activities, the limits for Commercial vegetable Production must not compromise mattes in (2)** **c) where the limits designed to achieve 4 a) are unlikely to achieve the TAS within 30 years without driving significant land use change for any activity, an exception is provided to clause 3.14(3), and instead an Action Plan as described in 3.15 must be adopted in addition to limits. The Action Plan**

		approach must consider the catchment as a whole, and all activities within the catchment. Together the limits and Action Plan must be designed to achieve TAS over time, as outlined in 3.15 (3). ~~(a)may set a target attribute state that is below the national bottom line for the attribute, despite clause 3.11(4); but~~ ~~(b)must still, as required by clause 3.11(2) and (3) set the target attribute state to achieve an improved attribute state without compromising the matters in subclause (2) of this clauSE~~ ~~(5) When implementing clauses 3.12 to 3.14 in relation to FMUs that include all or part of a specified vegetable growing area, a regional council must ensure that vegetable growers in the area are not exempt from any requirements (such as in limits, action plans, and conditions on resource consents) aimed at achieving target attribute states.~~ ~~(6)This clause ceases to apply to a specified vegetable growing area on the earlier of the following dates:~~ ~~(a)10 years after the commencement date; or~~ ~~(b) the date National Environmental Standards (or other regulations under the Act) com into force that~~ ~~(i)apply to the specified vegetable growing area; and~~

		~~(ii)are made for the purpose of avoiding, remedying, or mitigating the adverse effects of vegetable growing on freshwater.~~

Table 4 – National Environmental Standard For Freshwater

National direction for vegetable production could be progressed as an RMA amendment or a standalone NES. As the issue is urgent, our preferred approach is to amend the National Environmental Standard for Freshwater to include provisions for Commercial Vegetable Production.

Provision	Reason	Decision sought
Part 1 Section 6 Relationship between regulations and plan rules and resource consents	Regional Councils have been unable to create workable rules for vegetable production. Vegetable growers seek nationally consistent rules, many of them operate in multiple catchments and across regions.	Relationship between regulations and plan rules and resource consents (1) A district rule, regional rule, or resource consent may be more stringent than these regulations, **except for the commercial vegetable production provisions**. **1x) A district rule, regional rule, or resource consent may not be more stringent nor more lenient than the regulations relating to commercial vegetable production. The CVP provisions shall prevail over regional rules.** (2) A district rule, regional rule, or resource consent may be more lenient than any of regulations 70 to 74 (culverts, weirs, and passive flap gates) if the rule is made, or the resource consent is granted, for the purpose of preventing the passage of fish in order to protect particular fish species, their life stages, or their habitats.
NEW Sub part Sub Part 5	The proposed provisions make all commercial vegetable production below 5 ha permitted.	***Permitted activities*** ***The use of land on a farm for commercial vegetable production under 5ha is a permitted activity, commercial vegetable production over 5 ha is a***

Commercial Vegetable Production	Over 5 ha Commercial Vegetable production is permitted with a FWFP that meetings the permitted activity standard. The threshold of 5 ha is very small for CVP. However, it has been adopted as it aligns with the thresholds in the FWFP legislation. We recognise it could be possible to measure the area of a CVP farm using crop area; however, we think it is better to align the threshold for consenting with the definitions of farm (and landholding) in the NES F. The definition of fam in the NES F is suitable for CVP, because it relates to both owned and leased blocks regardless of whether they are contiguous, provided they are managed as a single operation. Commercial vegetable production that does not meet the permitted activity standard is Restricted Discretionary Activity.	***permitted if the activity complies with the following conditions:*** ***Conditions*** ***3) The condition is that the commercial vegetable growing farm over 5 ha must be undertaken in accordance with the farm's freshwater farm plan in accordance with RMA part 9A and the Freshwater Farm Plan must include the following minimum criteria:*** ***a. The freshwater farm plan and associated action plan must include a risk assessment that considers:*** ***i. The state of the freshwater receiving environment,*** ***ii. The biophysical characteristics of the farm including soil, rainfall and slope.*** ***iii. The practices associated with activity,*** ***4) The freshwater farm plan must:*** ***a. demonstrate that the grower is adopting a risk-based approach to managing risks over time though implementation of the action plan*** ***b. In determining the appropriate actions to manage risk a grower must consider***

	The GAP EMS standard is risk-based and would direct growers to implement the GMPs and BMPs identified in industry codes of practice. The farm specific actions are determined using the risk assessment, that accounts for catchment, biophysical and practice risks.	***industry codes of practice for managing nutrients, sediment, and irrigation.*** ***c. The freshwater farm plan must be updated to reflect rotation or expansion in the following manner:*** ***i. As land parcels change due to crop rotation or expansion, the freshwater farm plan risk assessment and action plan must be updated.*** ***ii. The freshwater farm plan, must document the location of all parcels that are being used for commercial vegetable production, including cover crop and pasture phases, and the actions relevant to each parcel.*** **Restricted Discretionary Activity:** **1) The use of land for commercial vegetable production is a restricted discretionary activity if the use does not comply with the applicable permitted activity conditions**. **Matters to which discretion is restricted:** **VI. Actions within the Freshwater Farm Plan to address the adverse effects, including**

		cumulative effects, of diffuse discharges of nitrogen, phosphorus, sediment, and microbial pathogens to water. **VII. Actions within the Freshwater Farm Plan to address any adverse effects on downstream drinking water supplies.** **VIII. The duration of the resource consent.** **IX. The monitoring, record keeping, reporting and information provision requirements of the holder of the resource consent to demonstrate and/or monitor compliance with the resource consent and Freshwater Farm Plan.** **X. The timeframe and circumstances under which consent conditions may be reviewed.**
Interpretation	Use the NES F definition of farm and land holding. Alter the definition of farm in the FWFP, as the current definition is different to the NES F and circular.	Farm means a landholding whose activities include agriculture. Landholding means 1 or more parcels of land (whether or not they are contiguous) that are managed as a single operation. ~~Farm~~ **Agricultural activity** means a farm where all or part of the farm is– (a) arable land use; or (b) horticultural land use; or (c) pastoral land use; or (d) other agricultural land use prescribed in regulations made under section 217M(1)(b) of Freshwater farm plans ; or (e)any combination of the above

Table 5 National Policy Statement for Horticulture

Because of the serious and immediate threat to CVP due to unworkable freshwater regulation, our focus is on progressing workable regulations for CVP as a priority, and therefore our preferred option focuses on the freshwater framework. If that framework cannot be progressed, an alternative is to provide for CVP as a permitted activity within the RMA as a transitional provision to address the immediate risk and to develop an NPS for Horticulture to set out the national policy considerations for horticulture. In the longer term, an NES CVP would still be developed.

The provisions below are similar to the provisions within the NPS Renewable Electricity Generation 2011.

Provision	Reason	Decision sought
Matters of National Importance	CVP is a matter of national importance because of the health benefits associated with a resilient supply of fresh fruit and vegetables.	**Matters of national significance** **The matters of national significance to which this national policy statement applies are:** **a) the need to develop, operate, maintain and expand horticulture throughout New Zealand; and** **b) the benefits of fresh fruit and vegetable supply for human health**
Objective	The objective should be for all horticultural activities, including new and existing horticulture, with a focus on achieving a resilient supply of vegetables for current and future generations, and the climate change benefits of horticulture as a low emissions primary production activity.	**To recognise the national significance of horticultural activities by providing for new and existing horticultural activities, such that New Zealand has a resilient supply of fresh fruit and vegetables for current and future generations, and a thriving lower emissions primary sector.**

Recognising the benefits of renewable electricity generation activities	This policy is similar to Policy A of the NPS Renewable Electricity Generation.	**Recognising the benefits of horticultural activities** **Decision-makers shall recognise and provide for the national significance of horticultural activities including the national, regional and local benefits relevant to horticultural activities. These benefits include, but are not limited to:** **a) maintaining or increasing security of fresh fruit and vegetable supply at local, regional and national levels by supporting existing horticulture and diversifying the type and/or location horticulture** **b) maintaining or increasing supply of fruit and vegetables while reducing or displacing greenhouse gas emissions.**
Acknowledging the practical constraints associated with CVP	This policy is similar to Policy C of the NPS Renewable Electricity Generation.	**Acknowledging the practical constraints associated with horticulture** **Decision-makers shall have particular regard to the following matters:** **a) the need to locate the horticultural activity where the soils and climate are suitable.** **b) The need for crop rotation** **c) The need for crop protection structures and ancillary activities** **d) the location of existing structures and infrastructure including, but not limited to,**

		roads, ports, the distribution network, and the need to connect fresh fruit and vegetables with retailers.
Managing reverse sensitivity effects on renewable electricity generation activities	This policy is similar to Policy D of the NPS Renewable Electricity Generation.	**Managing reverse sensitivity effects on horticultural activities** **Decision-makers shall, to the extent reasonably possible, manage activities to avoid reverse sensitivity effects on consented and on horticultural activities.**

Table 6 Resource Management Act – Specific Amendments to Provide for a Permitted Activity for Commercial Vegetable Production

Our preferred option is to progress national consistent rules for commercial vegetable production through an NES (and amendment to the NES Freshwater to include the provisions for CVP would be satisfactory). However, the current rules for vegetable production are unworkable, and are causing a risk to New Zealand's resilient supply of fresh vegetables. Therefore, it may be warranted to address this issue directly with an amendment to the RMA, with a longer-term solution progressed through future proposed legislation.

Provision	Reason	Decision sought
2 Interpretation	A definition of Commercial Vegetable Production is needed to support a Permitted Activity for Discharges from Commercial Vegetable Production This definition is from the Commodity Levies (Vegetables and Fruit) Order 2019.	***Commercial vegetable production means the following vegetables grown for commercial purposes:*** ***vegetables means the following vegetables grown in New Zealand for commercial purposes (including commercial processing):*** ***(a) artichokes (Globe and Jerusalem), Asian vegetables, asparagus, beans (excluding field-dried beans), beetroot, box thorn, broccoflower, broccoli, Brussels sprouts, burdock, buttercup squash, cabbage, capsicums, carrots, cauliflower, celeriac, celery, chilli peppers, chokos, courgettes, cucumbers, eggplant (also known as aubergine), Florence fennel, garland chrysanthemum, garlic, gherkins, herbs (including basil, bay, borage, caraway, chervil, chives, coriander, dill, fennel, horseradish, lemon balm, marigold, marjoram, mint, nasturtium, oregano, parsley, rosemary, sage, savory, sorrel, tarragon, and thyme), Indian vegetables, kohlrabi, kumara, leeks, lettuces, marrows, melons (including water, green netted,***

		honey dew, bitter, rock, white musk, and prince), onions, okra, parsnips, peas (excluding field-dried peas), potatoes (including seed potatoes), puha, pumpkin, purslane, radishes (including Chinese radish and daikon), rakkyo, rhubarb, salad leaves, salsify, scallopini, scorzonera, shallots, silverbeet, spinach (including water spinach), spring onions, sprouted beans and seeds, squash, swedes, sweetcorn (including baby corn), taro, tomatoes, turnips, ulluco, watercress, witloof (also known as chicory or endive), yakon, yams, and zucchinis; and ***(b) the hybrids of the vegetables listed in paragraph (a).***
New Section for Permitted Activity for Discharges from Commercial Vegetable Production	The limited environmental effects of Commercial Vegetable Production (CVP) should be managed with a permitted activity standard implemented through certified freshwater farm plans with additional requirements for CVP within catchments below national bottom lines. This approach will avoid unintended consequences for crop rotation and business turnover.	**Rules relating to the discharge of a contaminant to water or land from Commercial Vegetable Production.** **1. Despite section 15 and section 70, the discharge of contaminants to land and water from Commercial Vegetable Production are a permitted activity provided that all Commercial Vegetable Production over 5 ha is managed with a Freshwater Farm Plan developed in accordance with Part 9A.**

		2. **<u>This section prevails over any CVP rules and policies within Regional Plans and has immediate effect.</u>**

APPENDIX 2

NZGAP EMS Standard

Environment Management System (EMS) Add-On

Implementation Guideline
v1.3 Jan 2019

NZGAP
NEW ZEALAND
GOOD AGRICULTURAL PRACTICE

Overview

New Zealand GAP (NZGAP) provides assurance for the safe and sustainable production of fruit and vegetables in New Zealand by its certified members. NZGAP was established in 1999 and has maintained its position as a credible assurance scheme in New Zealand for addressing regulatory compliance and enabling market access both domestically and internationally.

The NZGAP Environmental Management System (EMS) add-on has been developed to enable growers to meet Regional Council requirements for Farm Environment Plans and provide ongoing compliance with Good Management Practice standards alongside the usual NZGAP assessment. The EMS assurance framework replicates what is already in place for core NZGAP programme and the standard is based on credible environmental quality assurance systems such as GLOBALG.A.P. and ISO 14001, while also addressing local regulatory environmental requirements.

These implementation guidelines support growers to meet the requirements in the checklist by listing each of the checklist questions (compliance control points) with accompanying compliance criteria and relevant guidance material. The guidance utilises references from New Zealand legislation, Industry Guidelines and Codes of Practice where growers can find relevant information for the management area.

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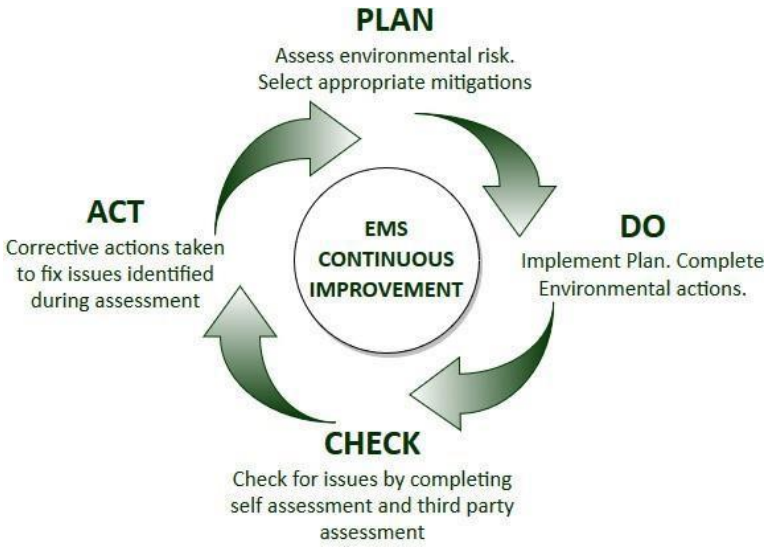
NZGAP Assurance Framework

The EMS provides a framework for environmental compliance, by assessing risk, identifying suitable mitigations, implementing mitigations/actions, and measuring ongoing improvements. The EMS is designed in this way to practically support growers with changes to improve the environmental impact of their growing operation. The Plan-Do-Check-Act (PDCA) cycle model is repetitive in nature (cycle) so that the effectiveness of the changes made are tested to identify improvements and then acted on, resulting in the desired outcome.

The 'Plan' allows growers to control and anticipate what changes need to be made in the growing operation as well as the nature and effectiveness of the change ('Do') so that it works for the individual situation. At the end of an EMS assessment the grower gets a report completed by the external assessor where any identified non-conformances are recorded ('Check'). These assessments are designed to be used by the grower to implement ('Act') the required changes and 'Plan' for next year to ensure continued compliance.



SMART Environmental Action Planning

The EMS operates under the principles of SMART Action Planning to help growers to develop actions that are: Specific, Measurable, Achievable, Realistic and Timely.

Specific: Actions should be clear and specific which helps to motivate the grower to achieve desired outcomes.

Measurable: Enables progress on actions to be tracked. Assessing progress helps with staying focussed on the goal, providing evidence and meeting deadlines.

Achievable: Actions need to be realistic and attainable to be successful. Whilst it is possible to set goals that are challenging and even push the limits that are unknown, having confidence in reaching that goal is important.

Relevant: Actions should be relevant to the business type and the issue being addressed following industry guidance.

Timely: Actions need to have set target dates for completion. A deadline helps focus attention and continually strive towards meeting the goal. Deadlines also help prevent any distractions and drive progress towards the longer-term goal of environmental improvement.

1. Organisation and Management			
Ref	**Question**	**Compliance Criteria**	**Category**
1.1	Does top management demonstrate leadership and commitment to effectively implement this Environment Management System?	Top management demonstrates leadership and commitment to effectively implement the Environment Management System by: • Showing accountability/ responsibility for effectiveness of EMS • Integrating the EMS into day to day business processes and meetings • Ensuring EMS achieves intended outcomes • Providing direction, support and resources • Promoting continual improvement	Leadership
1.2	Have interested parties (e.g. community, local authority) been determined and have their relevant needs and expectations been identified?	Interested parties/stakeholders that are relevant to the EMS should be determined (e.g. Customer, Regulator, Community, Employees, Land Lessor) and their relevant needs and expectations should be identified (e.g. improvement in water quality). The needs and expectations of the local authority can be found in the regional plan (e.g. objectives).	Interested parties
1.3	Has an Environment Policy Statement been established and implemented?	An Environment Policy Statement may be established and implemented for the business and should be reviewed and updated at least annually. It should: • Provide a framework for setting objectives and targets • Show commitment to protect environment • Show commitment to continual improvement • Be communicated to stakeholders	Environment Policy Statement

2. Planning and Objectives			
Ref	**Question**	**Compliance Criteria**	**Category**
2.1	Has the scope of this assessment (i.e. current land use and location) been determined?	The scope of the assessment shall be determined by location (e.g. location/area of owned/lease land) and land use (i.e. horticulture, winter grazing). Implementation of the EMS should be prioritised based on land ownership and agreements with the owners of any lease land or land swaps. The following may be provided for each parcel; the legal description, ID number (e.g. Agribase ID), location and ownership.	Scope
2.2	Have the environmental aspects (e.g. soil management) to be covered by this EMS been determined?	Relevant environmental aspects to be covered by this assessment have been determined (e.g. on the registration form). Only selected aspects will be included in the scope of the assessment. Required aspects for regional council compliance are soil management, nutrient management, water management and waterbody management. Optional aspects include biodiversity management, waste management, energy management and emissions management.	Environmental Aspects
2.3	Have short and long term environmental objectives been established for the relevant environmental aspects?	Short and Long term environmental objectives shall be in place for all environmental aspects identified for this assessment considering compliance obligations (Local authority objectives may be adopted). Risks and opportunities for each objective may be identified.	Objectives
2.4	Have targets been set/adopted to reduce environmental impact and enhance the surrounding environment?	Targets shall be set/adopted to reduce environmental impact while considering compliance targets. Growers may adopt targets for environmental improvement from the local authority plan and describe how implementing this EMS will help meet those targets.	Targets

3. Support for Implementation of the EMS			
Ref	**Question**	**Compliance Criteria**	**Category**
3.1	Has the environment system/plan been prepared by an approved adviser where required by the local authority?	Environment systems/plans shall be prepared by a suitably qualified and competent person who is approved by the local authority where required. A list of approved farm environment advisers can be found on local authority websites.	Adviser
3.2	Is advice on nutrient, soil and irrigation management obtained from an adviser or agronomist, and can they illustrate their competence by providing evidence of appropriate training and/or qualifications? If advice is not obtained from an adviser, is the grower's experience complemented by evidence of technical knowledge?	If advice on nutrient, soil and irrigation management is obtained from an adviser or agronomist, they shall illustrate their competence by providing evidence of appropriate training and/or qualifications. If advice is not obtained from an adviser, the grower's experience shall be complemented by evidence of technical knowledge. Growers and advisers shall have access to information on Good Management Practice and industry Codes of Practice (e.g. Code of Practice for Nutrient Management, the Erosion and Sediment Control Guideline, Irrigation Code of Practice). Evidence includes: Access to product technical information, training course attendance, use of industry guidelines and codes of practice, use of decision support tools, access to local authority guidance (e.g. Matrix of Good Management).	Adviser/ Grower Competency
3.3	If a nutrient budget has been prepared for the property, has it been completed by a certified nutrient management adviser where required?	If a nutrient budget has been prepared, it shall be completed by a certified nutrient management adviser where required by the local authority. A list of approved nutrient advisers can be found on local authority websites.	Adviser
3.4	Have environmental training needs of relevant staff been identified and has training been provided or planned where necessary?	Training needs should be identified and suitable training provided or planned where necessary. Staff training records shall be kept. Staff may attend industry or local authority workshops on Good Management Practice.	Training
3.5	Are appropriate elements of the EMS (e.g. environmental risks, mitigations and actions) communicated to relevant staff and/or contractors?	Relevant and/or contractors shall be advised on appropriate EMS information such as environmental risks, mitigations and actions to be undertaken.	Communic-ation

4. Resource Consents			
Ref	**Question**	**Compliance Criteria**	**Category**
4.1	Does the business hold current **land use** consents, or other local authority approvals (e.g. permitted activity), where required?	Growers shall hold current land use consents where required by the local authority. If a consent is not held, growers should meet other approvals or permitted activity rules in the local authority plan (e.g. land use, cultivation, land use change, minimum standards for vegetable production).	Land Use
4.2	Does the grower hold current **water extraction and use** consents, or other local authority approvals (e.g. permitted activity), where required?	Growers shall hold current consents, or other local authority approvals, for water extraction and use where required. If a consent is not held, growers should meet other approvals or permitted activity rules in the local authority plan (e.g. surface water take, bore water take, water use for irrigation)	Water Extraction and Use
4.3	Does the grower hold current **discharge** consents (air/land/water) or other local authority approvals (e.g. permitted activity), where required?	Growers shall hold current discharge consents where required by the local authority. If a consent is not held, growers should meet other approvals or permitted activity rules in the local authority plan (e.g. discharge of washwater, discharge of wastewater/storm water, discharge of nutrients, discharges to air).	Discharge

Mapping Guidance: Growers may use print out of google map imagery or use an electronic mapping service to allow for accurate mapping and identification of relevant features. Electronic maps allow more information to be included on one map by having layers associated with different features (e.g. soil maps). Local authorities provide online mapping services which provide useful information such as soil layers, slope, parcel boundaries and identification of any significant areas.

5. Mapping			
Ref	**Question**	**Compliance Criteria**	**Category**
5.1	Has an up to date property plan or map been prepared which details important site features as required by the local authority?	Property maps (owned/lease land) shall provide visual identification and location of any features required in the local authority plan including: • Property boundaries (currently owned and leased land) • Land management units (e.g. cropped areas) • Potential critical sources (point and area) for contaminants (e.g. erosion risk, steep slopes, flood/drought prone areas, fertiliser storage) • Permanent or intermittent rivers, streams, lakes, ponds, drains and wetlands • Riparian vegetation and barriers/fences adjacent to waterbodies • Any significant areas as defined by the local authority (see local authority mapping: e.g. significant indigenous biodiversity areas, cultural landscape values management area) Property maps may also identify existing and future mitigation actions of this EMS which can be mapped (e.g. new bunding).	Property
5.2	Have soil maps and/or descriptions been prepared for the property?	A description of the types of soils across the farm(s) may be maintained on a soil map, or their classification and characteristics identified and described (e.g. LUC class, S-map classification).	Soil
5.3	Do property maps or descriptions identify locations where most surface water is entering and leaving each block/paddock?	Property maps and/or descriptions should identify the locations where water enters and leaves blocks/paddocks. Surface water is a large driver of contaminant loss (e.g. soil erosion, nutrient run-off) to waterways so highlighting water flow paths enables identification and location of suitable mitigations.	Water
5.4	Has the location of any spring heads, wetlands or spring-fed streams on the property map been identified where required by the local authority?	The location of any spring heads, wetlands or spring-fed streams shall be identified where required by the local authority. These features have high instream biodiversity values so need to be identified so that they can be protected.	Sensitive areas

Soil Management Guidance:

Industry Guidelines and Codes of Practice provide growers with useful information and guidance on the range of options available to growers to assist to manage soils sustainably.

- Erosion & Sediment Control – Guidelines for Vegetable Production http://www.hortnz.co.nz/assets/Uploads/Auckland-Waikato-ES-Control-Guidelines-1-1.pdf

Soil Management			
Ref	**Question**	**Compliance Criteria**	**Category**
6.1	Has a soil management plan been developed and implemented to help maintain or improve soil health, plus prevent soil erosion and sediment loss?	A soil management plan shall be developed and implemented to help maintain or improve soil health, plus prevent soil erosion and sediment loss. It should be reviewed at least annually. The plan should include: a soil assessment (6.2), a paddock assessment (6.5), identification of critical source areas (6.5), soil health and quality (6.2), mitigations for erosion control (6.7), mitigations for control of sediment (6.8), records of cultivation (6.9) and actions to be undertaken (10.1).	Planning
Soil health and fertility			
6.2	Has a soil assessment been completed to determine soil quality and health?	A soil assessment should be completed to determine soil quality and health addressing: soil structure, compaction, drainage, soil organic matter, soil biological activity. Growers may determine soil health by completing a combination of visual assessment (e.g. microorganism activity, earthworm numbers) and soil tests (e.g. measure compaction, infiltration, soil organic matter).	Risk Assessment
6.3	Have techniques been used to maintain or improve soil quality and structure as well as reduce compaction?	Techniques should be used to maintain improve soil quality and structure as well as reduce compaction. Examples include: Cropping rotations, long term cropping plan, cover crops, incorporating cover crops/ crop residues, sub-soiling, soil aeration, minimum till and controlled trafficking.	Environ-mental Action
6.4	Are measures implemented or planned to maintain or increase soil organic matter and improve soil biological health?	Measures are implemented to maintain or increase soil organic matter and improve soil health. Examples include: minimum till, adding organic matter/fertilisers, incorporating cover crops/crop residues and management of soil pH.	Environ-mental Action

Soil Management			
Ref	**Question**	**Compliance Criteria**	**Category**
6.5	Has an assessment of the risks of soil erosion and sediment loss been completed (Template 6A and 6B)?	The risk of soil erosion and sediment loss shall be completed for each paddock/block where required by the local authority (Template 6A: Risk of soil erosion and sediment loss – property assessment, Template 6B: Risk of soil erosion and sediment loss – paddock assessment). Assessments should follow industry guidance (Erosion and Sediment Control Guidelines) and consider both site specific and management specific risks. Critical source areas for erosion and sediment loss should be identified. Risks and mitigations shall be documented and may be identified on farm maps. The risk assessment should consider the following sites specific risks: soil type, slope, weather, water entering the paddock, water exiting the paddock, distance to waterways, flood risk areas, and the following management specific risks: crop type, growing/cultivation technique, crop coverage, soil compaction, infiltration rates and drainage. Identifiable issues include: major critical source areas, compaction, channelling of overland flow, rilling, ponding and cultivation close to waterways without appropriate mitigations in place.	Risk Assessment
6.6	Is the risk of soil erosion assessed prior to carrying out all field operations?	The risk of soil erosion or degradation should be assessed prior to carrying out all field operations. Cultivation should only occur when soil conditions are appropriate. Growers should consider the operation being performed, slope, timing, field conditions and weather conditions.	Risk Assessment
6.7	Are appropriate measures implemented or planned to reduce or minimise the risk of soil erosion (Template 6C)?	Appropriate mitigations shall be implemented or planned to retain soil in the paddock to reduce dependence on edge of field sediment retention mitigations (Template 6C: Soil erosion and sediment loss – control measures and action plan). Examples include: wheel track ripping/dyking, cover crops, contour drains, break crops and short row length, shelterbelts. Overland flow of water is a major driver of soil erosion so measures shall be implemented or planned to control water entering paddocks. Examples include: interception drains, correctly sized culverts, benched headlands, bunds, grassed swales and raised accessways.	Environ-mental Action

Soil Management			
Ref	**Question**	**Compliance Criteria**	**Category**
6.8	Are appropriate measures implemented or planned to reduce or minimise and/or prevent sediment loss (Template 6C?	Appropriate control measures shall be implemented or planned to reduce or minimise soil loss (Template 6C: Soil erosion and sediment loss – control measures and action plan). Examples include: raised accessways/bunds, appropriate setback from drains/waterways, vegetated buffers, super silt fence s, decanting earth bunds and sediment retention ponds.	Environ-mental Action
6.9	Are records kept for cultivations, sowing, planting, and other relevant field operations (e.g. wheel track ripping)?	Records shall be kept for all field operations (date, operation, method, location) which are likely to have an effect on soil health, quality or erosion (e.g. cultivations, sowing, planting, wheel track ripping).	Records
6.10	Do any newly adopted mitigations meet the minimum design and operation requirements outlined in relevant industry guidance and codes of practice?	Newly adopted mitigations (since last assessment) should meet the minimum design and operation requirements outlined in relevant industry guidance and codes of practice (e.g. design and construction of sediment retention ponds).	Design
6.11	Is marginal land retired or actively managed to ensure soil conservation measures are in place?	Marginal land is retired or actively managed to ensure soil conservation measures are in place. For example: marginal land which is steep or actively eroding may be retired with high-risk areas having mitigations in place (such as planting) to minimize the risk of erosion.	Marginal Land

Nutrient management guidance:

Industry guidance and codes of practice can help growers to understand and implement good and best management practices for nutrient management.

- Horticulture New Zealand "Code of Practice for Nutrient Management" http://www.hortnz.co.nz/assets/Uploads/Code-of-Practice-for-Nutrient-Management-v-1-0-29-Aug-2014.pdf
- The Fertiliser Association of New Zealand's Code of Practice for Nutrient Management http://www.fertiliser.org.nz/Site/code_of_practice/default.aspx

Nutrient Management			
Ref	**Question**	**Compliance Criteria**	**Category**
7.1	Is there nutrient management plan in place to help in decision making for the selection and use of fertiliser?	A nutrient management plan shall be in place to help in decision making for the selection and use of fertiliser. The plan should include: The nutrient management objectives, the risk of nutrient loss (7.2), crop selection and nutrient requirements (7.2), available nutrients in soil (N, P, K, Mg, etc) (7.4) (Nitrogen Quick Test, soil/foliage tests), nutrient recommendations for crop (7.4), types of fertilisers (including composts) to be used and their nutrient contributions (7.8), and records of nutrient applications (7.8).	Planning
7.2	Has the risk of nutrient loss been assessed prior to application of nutrients (Template 7B)?	The risks of nutrient loss shall be assessed prior to application of nutrients (Template 7B: Assessing the risk of nutrient loss) based on the contributing factors of the site risks (generally cannot be controlled) and management risks (what can be controlled). Site specific risks include: Soil type, quality, condition, topography, climate, proximity to waterways, and ponding/flood risk areas. Management attributed risks include: Soil moisture, access to adequate irrigation, degree of compaction, degree of soil borne disease, available nutrients in soil, excess application of nutrients, application method, paddock history (crops, nutrients), rotation and crop selection, crop failure, and cultivation of long term pasture (>5 years).	Risk assessment
7.3	Are fertilisers handled, stored and used to minimise the risk of spillage and contamination of the environment and water sources?	Fertilisers shall be handled, stored and used to minimise the risk of spillage and contamination of the environment and water sources. Fertilisers should be stored in a clean covered, dry area and handled according to industry guidance.	Handling and Storage

Nutrient Management			
Ref	**Question**	**Compliance Criteria**	**Category**
7.4	Are nutrients applied relative to the predicted uptake levels of the plant from planting to maturity?	Nutrients shall be applied according to the nutrient management plan relative to the predicted uptake levels of the plant from planting to maturity. Applications should take in into account nutrient level in soils, crop, growth phase, rainfall, field capacity, soil saturation levels.	Application
7.5	Have measures been taken to recycle nutrients where feasible and appropriate (e.g. hydroponics)?	Measures should be taken to recycle nutrients where feasible and appropriate (e.g. glass house nutrient solution).	Application
7.6	Is water used in nutrient solutions stored and discharged according to industry guidance local authority rules where required?	Water used in nutrient solutions is stored and discharged according to industry guidance and local authority rules where required. (e.g. *Greenhouse Nutrient Discharge – Requirements for Achieving Good Practice*)	Storage and Application
7.7	Are measures implemented or planned to improve nutrient uptake and minimise nutrient loss?	Measures shall be implemented to improve nutrient uptake and minimise nutrient loss (Template 7C: Nutrient loss – Control Measures and Action Plan) based on the industry code of practice, depending on the stage of the crop cycle: Pre–planting, planting, post–planting, harvest, post–harvest.	Environ-mental Action
7.8	Is there a system for recording the application of organic and inorganic nutrients and conditioners (including both soil and foliar applications)?	Records shall include the following: fertiliser type, nutrient content of fertiliser (N,P,K etc), amount applied (kg/ha), placement (e.g. side-dress, base application, liquid application and compost), date of application, operator/applicator name, block location and crop appliedto.	Record Keeping
7.9	Is all fertiliser spreading equipment calibrated so that it can accurately deliver the recommended treatment?	Fertiliser spreading equipment should be calibrated so that it can accurately deliver the recommended treatment. Calibration should occur at least annually.	Calibration

7. Nutrient Management			
Ref	**Question**	**Compliance Criteria**	**Category**
Nutrient Budgets (Recommended – unless stated otherwise in the resource consent or local authority rules)			
7.10	Has a current nutrient budget been prepared for the property, where required, using a tool approved by the local authority (e.g. OVERSEER, NCheck)?	Where required, a nutrient budget shall be prepared for the property or each management unit according to local authority requirements using an approved tool (e.g. OVERSEER, Ncheck). Small operations (e.g. <5ha) and those leaching low amounts of nutrients are exempt from having to prepare a nutrient budget.	Model
7.11	Has an assessment of the nutrient budget been completed and has it been determined to be robust and accurate?	The nutrient budget shall be assessed to determine its robustness and accuracy (accuracy may be low due to model limitations). The assessment considers data entry to the model and determines if the results reflect the activities undertaken on the property and are consistent with the nutrient management and irrigation plans.	Assessment
7.12	Has a Nitrogen Loss Baseline been calculated for the property where required by the local authority?	Where required by the local authority, a nitrogen loss baseline shall be prepared for the property. Note that the methodology for development of a Nitrogen baseline differs from region to region (e.g. Land Use Capability, N loss in representative year, average N loss during baseline period).	Baseline
7.13	Does the current nutrient budget show compliance with regulatory limits (e.g. local limit or resource consent limit)?	Where practicable, the nutrient budget shall show compliance with the regulatory limits for the property or catchment. The accuracy and limitations of current models should be taken into account when assessing compliance with regulatory limits (e.g. local limit or resource consent limit).	Limit

Irrigation and Water Management			
Ref	**Question**	**Compliance Criteria**	**Category**
8.1	Has a documented water management plan been developed for the property (including irrigation, washwater etc.)?	A documented water management plan shall be developed used and reviewed at least annually. The water management plan should consider: all water uses, irrigation system type (8.3), environmental risk (8.2), total predicted irrigation required (8.4), actual irrigation water applied (8.7), return period, evaporation and transpiration rates, collection of wastewater.	Planning
8.2	Has an environmental risk assessment been completed for all water uses?	An environmental risk assessment shall be completed for all water uses and reviewed at least annually. Identified issues include: system leaks, ponding, overland flow, irrigation of unproductive areas (e.g. tracks and headlands), discharges to surface water.	Risk Assessment
8.3	Are measures implemented or planned to ensure that water use is optimised and risks to the environment are minimised (Template 8B)?	Measures shall be implemented or planned to ensure that water use is optimised and risks to the environment are minimised (Template 8B: Water use – Control Measures and Action Plan) based on industry guidance	Environ-mental Action
8.4	Is the irrigation system assessed, maintained, calibrated and evaluated to ensure optimal performance?	Irrigation equipment shall be assessed, maintained, calibrated and evaluated to ensure that the expected volume is applied and the spread of the water is evenly applied. Checks include: Visual inspection, assessment of pump, pipe and filter performance (including energy use), depth, rate and uniformity tests (including determination of water application efficiency), seasonal irrigation efficiency estimation.	Calibrate, Maintain
8.5	Has major new irrigation infrastructure been designed and installed in accordance with industry standards and codes of practice? Have new irrigation systems been commissioned?	Major new irrigation infrastructure (since joining EMS add-on) shall be designed and installed in accordance with industry standards and codes of practice. The reference documents for new irrigation systems been commissioned are: Design Standards for Piped Irrigation Systems in New Zealand (Irrigation NZ, October 2012) and the Code of Practice for the Design of Piped Irrigation Systems in New Zealand (Irrigation NZ, October 2012)	Design
8.6	Are appropriate records of irrigation applications kept?	Records of irrigation applications should be kept including block/paddock ID, date and time, area irrigated, and volume applied (e.g. flow rate, hours of irrigation, total mm's, volume etc).	Records

Irrigation and Water Management			
Ref	**Question**	**Compliance Criteria**	**Category**
8.7	Is water used for floatation, washing and cleaning disposed of in accordance with industry guidance and local authority rules where required?	Water used for floatation, washing and cleaning shall be disposed of in accordance with industry guidance and local authority rules where required (e.g. vegetable washwater code of practice).	Water disposal
8.8	If identified as feasible (considering impacts on food safety), have measures been taken to collect and/or recycle water?	Measures have been taken to collect and/or recycle water where identified as feasible, while also considering potential impact on food safety.	Water recycle

9. Water Body Management			
Ref	**Question**	**Compliance Criteria**	**Category**
9.1	Has an environmental assessment of waterways and drains been undertaken to determine if there are any risks of contamination from the property?	Any waterways and drains are assessed to determine if there are any risks of contamination from the enterprise. Evidence of issues include: overland or concentrated flow of water into waterways, cultivation too close to open drains waterways, soil present in waterways.	Risk assessment
9.2	Are waterways protected from contamination using appropriate barriers, setbacks, buffers or riparian planting?	Waterways shall be protected from contamination using appropriate combinations of barriers, setbacks, buffers or riparian planting where required. Refer to the applicable local authority plan for specific requirements on setbacks and waterbody management.	Environ-mental Action
9.3	If livestock are part of cropping rotations, are they excluded from applicable waterways where required?	Livestock are excluded from applicable waterways on the property where required by the local authority. Refer to the local authority plan for definition of applicable of waterways.	Environ-mental Action
9.4	Are waterways and drains managed to protect mahinga kai values?	Mahinga Kai values shall be protected recognising the cultural and ecological sensitivity to discharges of contaminants where required by the local authority (e.g. Selwyn Te Waihora – See *Mahinga kai Guidelines for Selwyn Farmers*). Mahinga kai relates to the traditional value of food resources. Where applicable; mahinga kai species and habitats shall be protected when waterway (including drains) management and vegetation clearance occurs, and mahinga kai habitats and species shall be sustained through management of remaining native vegetation and wetlands.	Environ-mental Action

Environmental Actions and Continuous Improvement			
Ref	**Question**	**Compliance Criteria**	**Category**
10.1	Has an adequate environmental action plan been developed which includes short-term and long-term actions (Template 10A plus 6C, 7C and 8B?	An adequate environmental action plan shall be developed which includes short-term (0-1 years) and long-term (1-5 years+) actions (Template 10A: Environmental Action Plan plus 6C: Soil erosion and sediment loss – Control Measures and Action Plan, 7C: Nutrient loss – Control Measures and Action Plan, and 8B: Water use – Control Measures and Action Plan). Actions and completion dates require careful consideration as they must then be undertaken according to the plan unless there is significant justification. The plan should include: what will be done, when it is expected to be completed, when it is actually completed and who is responsible. The grower may follow the principles of SMART Action Planning: Specific, Measurable, Achievable, Realistic, Timely.	Action planning
10.2	Have processes been established to ensure that the actions identified in the environmental action plan are undertaken?	Processes shall be established to ensure that the actions identified are undertaken according to the plan. Failure to meet the requirements in the plan may result in sanctions from NZGAP and/or the local authority.	Action Taken
10.3	Have identified actions been completed to an acceptable standard in accordance with the timelines in the environmental action plan?	Required actions been completed to an acceptable standard in accordance with the timelines in the action plan. Aspirational actions/enhancements may be deferred. Documented information shall be maintained (to the extent necessary) to have confidence that the actions have been carried out as planned. Some actions may be deferred with reasonable justification.	Action Timing
10.4	Are existing environmental mitigations managed and maintained to ensure their ongoing effectiveness?	Existing environmental mitigations shall be managed and maintained to ensure their ongoing effectiveness (e.g. maintenance of existing buffer strips)	Action Taken

Environmental Actions and Continuous Improvement			
Ref	**Question**	**Compliance Criteria**	**Category**
10.5	Have any aspirational environmental actions or enhancements been implemented (i.e. Best Management Practice)?	Aspirational environmental actions or enhancements may be identified and implemented (i.e. Best Management Practice)?	Action Taken
10.6	Has the EMS been reviewed at planned intervals (at least annually), to support continuous improvement and ensure its continuing suitability, adequacy and effectiveness?	The EMS shall be reviewed annually to support continuous improvement and ensure its continuing suitability, adequacy and effectiveness. The annual EMS self-assessment shall be completed and submitted to NZGAP as part of the annual renewal process.	Review