

Operations Environmental Report 2018 - 2019



From Greg Campbell, Chief Executive Officer

Operations Environmental Report 2019



I'm glad to be able to share the Ravensdown's Operations Report for 2019.

As a farmer-owned co-operative, Ravensdown is here to enable smarter farming for a better New Zealand. An important part of that purpose is to reduce environmental impacts from both our farming shareholders and from our own activities.

We take our sustainability, emissions management and compliance obligations seriously and have been reporting on the environmental performance of our operations since 2001.

There's always more that could be done. These reports are about stating the facts, measuring performance, while identifying progress and setbacks.

Where our performance has met expectations, we continue to stay vigilant. With such a large number of sites

manufacturing or handling hundreds of thousands of tonnes of bulk material, which is defined by the Resource Management Act as a contaminant, risks are always present.

Where our performance has not met our expectations, we redouble our efforts and focus on fixing issues at their source. Resource consent breaches are reported on page 7.

This report deals with our manufacturing operations, fertiliser stores and lime quarries. Ravensdown has used consistent measures to track our environmental performance since 2000 at our three superphosphate manufacturing sites in order to identify trends and correct any shortfalls.

There are many other environmental impacts that are being mitigated both by our farmers and throughout the rest of our business. Our new Sustainability Manager is bringing more structure to the organisation and reporting of these initiatives.

More can be learned in our 2019 Integrated Report which contains our greenhouse gas benchmark and targets – among other environmental considerations.

As members of the Sustainable Business Council, initiating signatories in the Climate Leaders Coalition and active partners in the Aotearoa Circle, Ravensdown is determined to take the lead in environmental reporting and performance.

Thank you for taking an interest in our operations and our environmental credentials. We appreciate you taking the time to read this report and learn about what our team is doing to make progress on the environmental front.



Greg Campbell
Chief Executive Officer
12 August 2019



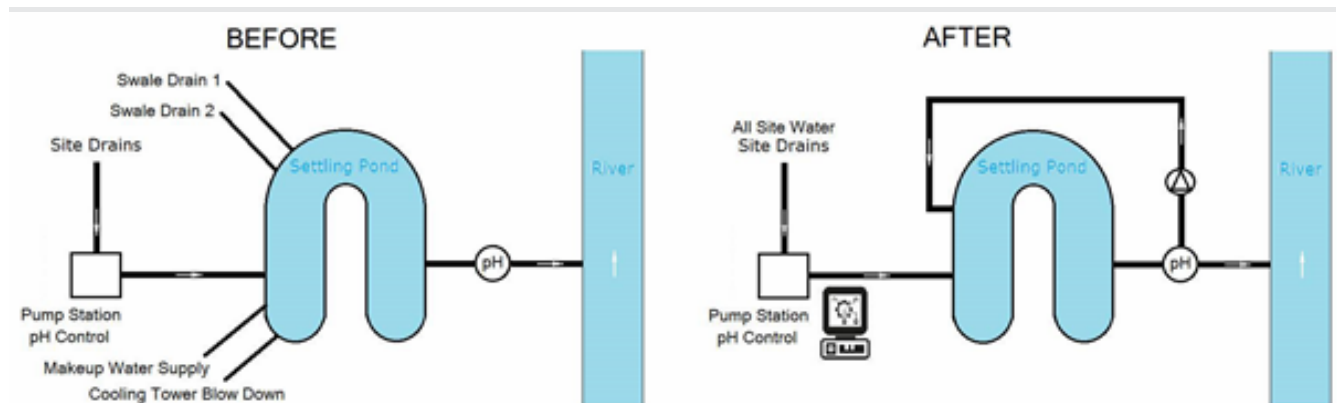
Photo: Hawke's Bay, North Island

Cover: Dunedin works at Ravensbourne on Otago harbour

Manufacturing sites

Emissions across all three superphosphate manufacturing sites are closely tracked. Fluoride and sulphur dioxide emissions per tonne of fertiliser output continue to be at reduced levels. Updates from each superphosphate manufacturing site are provided below.

Napier Works



Napier Stormwater Redesign

- Redesign of stormwater capture and dosing prior to river discharge to better control pH dosing and discharge variability.
- Updating of automation of the of the pH dosing at pump station.
- Installation of recirculating pump at the settling pond to give best representation before discharge.

Christchurch Works

- Stormwater project progressing toward an April 2020 completion date, including capturing and containing all on-site stormwater from around the urea dispatch area.
- New gas storage bunker built to house our portable gas bottles, separating different classes of gases.
- Site housekeeping improvements have been made to contribute to the improvement of stormwater management across the site.
- Upgrades made to the solids trap for the plant wash bay which improves management of the green ponds, removing solids and making it easier to clean.
- Meeting and site tour held with the Halswell-Hornby-Riccarton Community Board on 15 November 2018.
- Presented to the Christchurch-West Melton Zone Committee meeting on 28 March 2019 to report on improvements being made to the site stormwater management.

- Leaking gutters have been replaced to keep clean roof water away from potentially unclean surfaces.
- Improvements to the screening along the northern boundary fence have been completed to prevent intake product entering the neighbouring property.
- Improved storage of pallets – these are now cleaned in the washdown bay before being stored to keep product off the ground.



New gas storage bunker separating different classes of gases.



New spouting for better site water control.



New screening near site intake system.

Manufacturing sites

Christchurch Works Fire

On Tuesday morning, 9 October 2018, a major fire occurred at the Christchurch Works affecting the intake system and four of the sites 13 stores. As the incident was being managed, attention was given to the stormwater system and the potential for fire-fighting water to carry nutrient and building contaminants. Preventive actions averted problems on the day and subsequent removal of post-fire residues and sediments from the site and drains ensured no adverse effects, other than the black smoke from burning rubber conveyor belts. The fire was quite disruptive to the local roading network, and to nearby businesses. Conscious of the need to acknowledge disruption and neighbours' concerns, Ravensdown communicated proactively with the community; thanking them and the Fire Service for their support.



Dunedin Works

- Demolition of 160 Ravensdowne Rd Industrial Buildings.
- New fuel-efficient Volvo loaders purchased.
- Stormwater pH correction system – caustic dosing of stormwater ponds to better control pH, with automatically activated valve installed to prevent low pH water release.
- New drain installed in main yard.
- New melter building covering critical melter assets.
- Onsite bagged store (reducing need for truck movements and reducing external warehousing costs).
- New catalyst installed in acid plant converter tower.
- A backup SO₂ stack analyser was installed. The analyser runs in parallel with the existing analyser and provides redundancy for continuous environmental monitoring.
- New ride-on sweeping equipment purchased to minimise risks from fertiliser products on the yard.



On-site bag store



Catalyst replacement at Acid Plant



New fuel-efficient Volvo loader

Stores network and lime quarries

New Plymouth

With the sale of the old eight hectare New Plymouth store site, and the building of a new store nearby, Ravensdown was able to honour a 2004 agreement with the local Ngati Tawhirikura hapu of Te Atiawa iwi relating to the waahi tapu site of the Aotere Pa.

Modified by over 100 years of industrial occupation, initially as an abattoir and then as a fertiliser works since 1929, and scarred by a railway siding, some attributes of the pa site are still intact. Kaitiakitanga rests with Ngati Tawhirikura, so it was a privilege for Ravensdown to be able to structure the commercial land deal in a way that allowed for the waahi tapu site to be handed back to the hapu at a ceremony on 12 April 2019.



Handing Back Aotera Pa Site to Ngati Tawhirikura hapu at Old New Plymouth Store Site

The Stores Network

- Asbestos removal at Nelson.
- Mangatainoka store completes project to bring dispatch inside.
- Several sites have external consultants working on stormwater management and treatments to improve discharge quality.
- More than ten sites are conducting stormwater monitoring in partnership with ARL.
- Significant work at Seadown store regarding groundwater.
- Storage and Handling Protocol rolled out to all stores including consignment stores with positive results.



New ride-on sweeper for New Plymouth store

Lime Quarries

- Passive wetland development at Supreme Lime to capture sediment before discharge.
- Geraldine project to optimise materials handling and aglime processing to reduce the need for drying and the associated use of coal required. Around a 20% reduction in coal use and associated greenhouse gases has been achieved.

Environmental performance and compliance

All environmental comments/complaints are logged as part of our Environmental Management System. This applies to all aspects of our operations. All complaints are handled through our corrective action system. This ensures complaints are documented, investigated and where improvement opportunities are identified, appropriate actions are taken and communicated back to the complainant. A summary of current and historic complaints relating to the three superphosphate plants is provided below.

2018-2019 Environmental Complaints	Napier	Christchurch	Dunedin	Total by Type
Odour	0	2	2	4
Noise	0	0	2	2
Dust	0	0	3	3
Other	0	29	2	31
Total	0	31	9	40

Environmental Complaints	Napier	Christchurch	Dunedin	Total
1998-1999	2	9	33	44
1999-2000	6	31	7	44
2000-2001	6	35	8	49
2001-2002	3	17	13	33
2002-2003	3	13	33	49
2003-2004	6	15	16	35
2004-2005	12	16	19	47
2005-2006	17	126	7	150
2006-2007	5	35	4	44
2007-2008	4	68	7	79
2008-2009	0	23	19	42
2009-2010	0	12	25	37
2010-2011	2	8	30	40
2011-2012	4	12	34	50
2012-2013	2	14	29	45
2013-2014	0	17	22	39
2014-2015	4	21	14	39
2015-2016	1	13	30	44
2016-2017	0	9	8	17
2017-2018	1	10	11	22
2018-2019	0	31	9	40

Environmental performance and compliance

The increase in complaints at Christchurch primarily relates to a proactive campaign to check local residence glass quality to see if impacted by cumulative fluoride emissions. This accounted for 24 of the 31 complaints reported.

There were four Regional Council interventions in the 2018-19 year where our operations fell short of standards.

1. Christchurch Works – Environment Canterbury has issued an abatement notice regarding stormwater discharges to the City Council system and ultimately to the Hayton Stream catchment, requiring improvements by April 2020. A number of projects are underway to improve the quality of the stormwater discharge from this large site. That work is being done in close communication with Environment Canterbury
2. New Plymouth Store – Taranaki Regional Council issued an abatement notice in May 2019 as stormwater discharges to the Mangaone Stream (that runs beside the site) did not meet consented standards on two occasions. Since the notice was issued, several operational improvements were made

and an independent engineer is in the process of reviewing the design and effectiveness of the stormwater management system. Overall the Taranaki Regional Council has commended Ravensdown on its environmental performance at both the old and the new sites at New Plymouth, in a letter from the CEO in March 2019, so it is disappointing that our high standards were not met.

3. Seadown Store – since 2017 the site has been under a non-compliance notice from Environment Canterbury regarding elevated nitrate levels in downgradient bores. Consultants are undertaking comprehensive assessments of groundwater in the vicinity, checking nitrate and flow directions. As the many influences on these bores are still being determined, the work is being undertaken in close liaison with the Council who are satisfied with progress.
4. Gisborne Store – a non-compliance notice was received from the Gisborne District Council in February 2019 relating to spillages from a conveyor belt, with potential to enter stormwater. Site cleanliness has been addressed and a stormwater management plan is to be prepared by May 2020.

Environmental performance indicators

2018-2019	Air*		Water*		
	kg SO ₂ /t ssp	kg F/t ssp	kg F/t ssp	kg P/t ssp	kg SS/t ssp
Napier	0.62	0.001	0.004	0.003	0.004
Christchurch	2.17	0.006	0.002	0.001	0.008
Dunedin	1.97	0.008	0.078	0.000	0.039
Average	1.26	0.004	0.019	0.002	0.012

*Based on the quantity of superphosphate (ssp) despatched from each site.

Note:

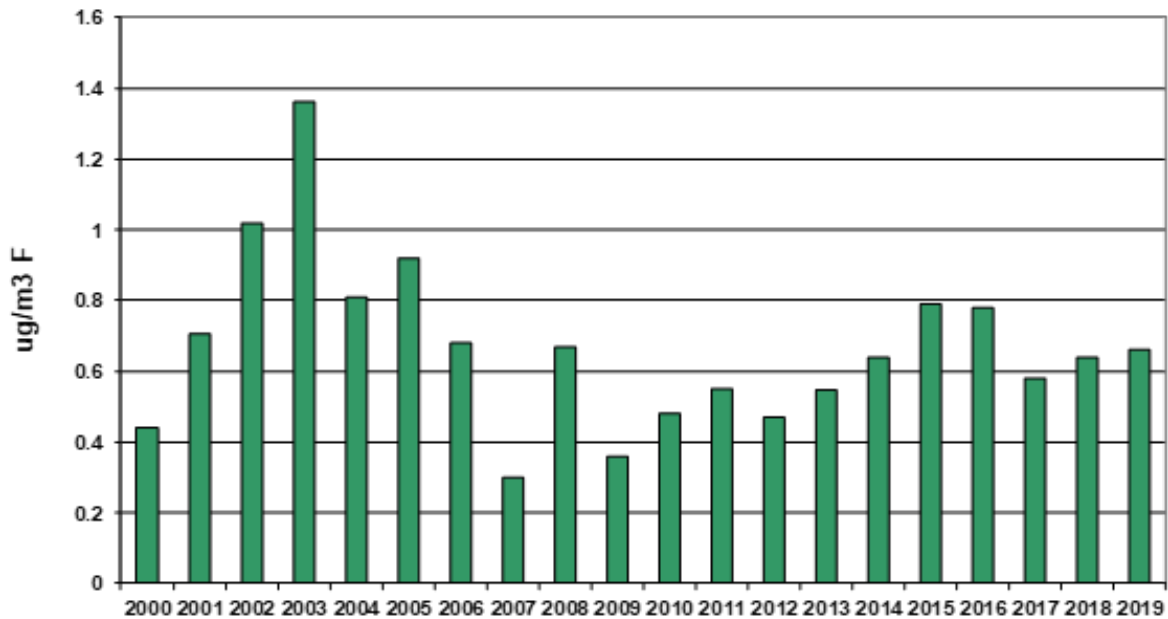
Christchurch has only measured water discharge from site in the last two years, as the majority is returned to the greenwater system and re-used. Fluoride measurement in the water started only this year.

Christchurch and Dunedin operate single absorption acid plants. The Napier plant with double absorption provides superior conversion levels which in turn give very low discharge levels of SO₂ to air.

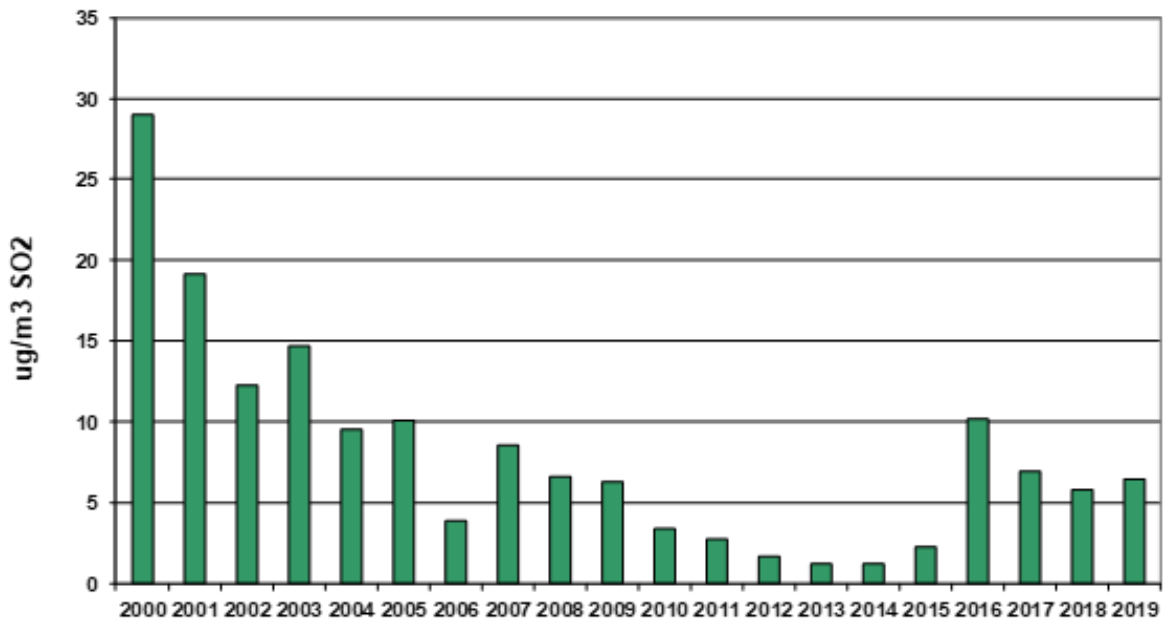
Average ambient air levels

It is important to note that because ambient monitors are at varying distances from source, comparisons between the three works are not relative.

Dunedin Average Ambient Fluoride

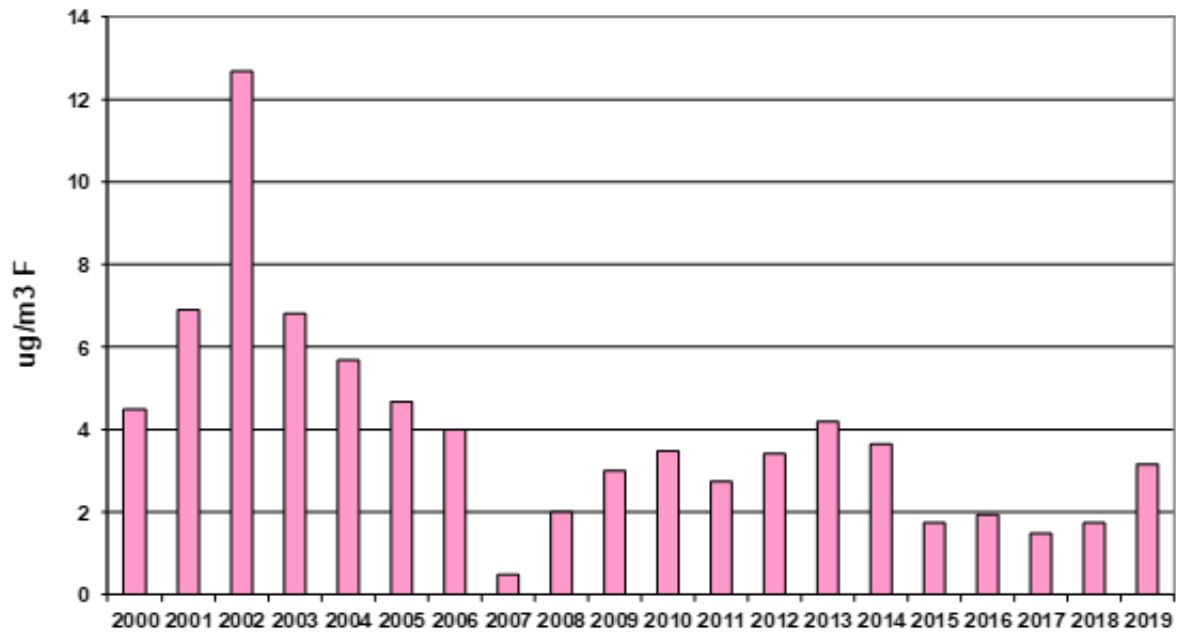


Dunedin Average Ambient Sulphur Dioxide

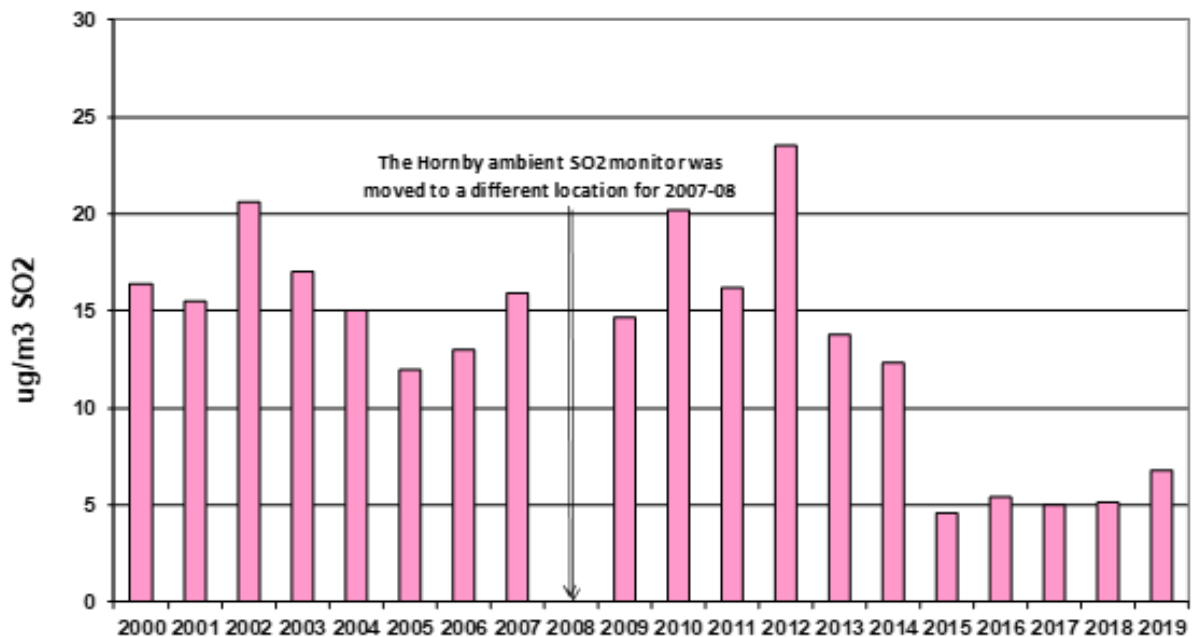


In 2015-2016, some recalibration of the data being received at the SO₂ monitoring site occurred, resulting in an apparent increase in levels.

Christchurch Average Ambient Fluoride



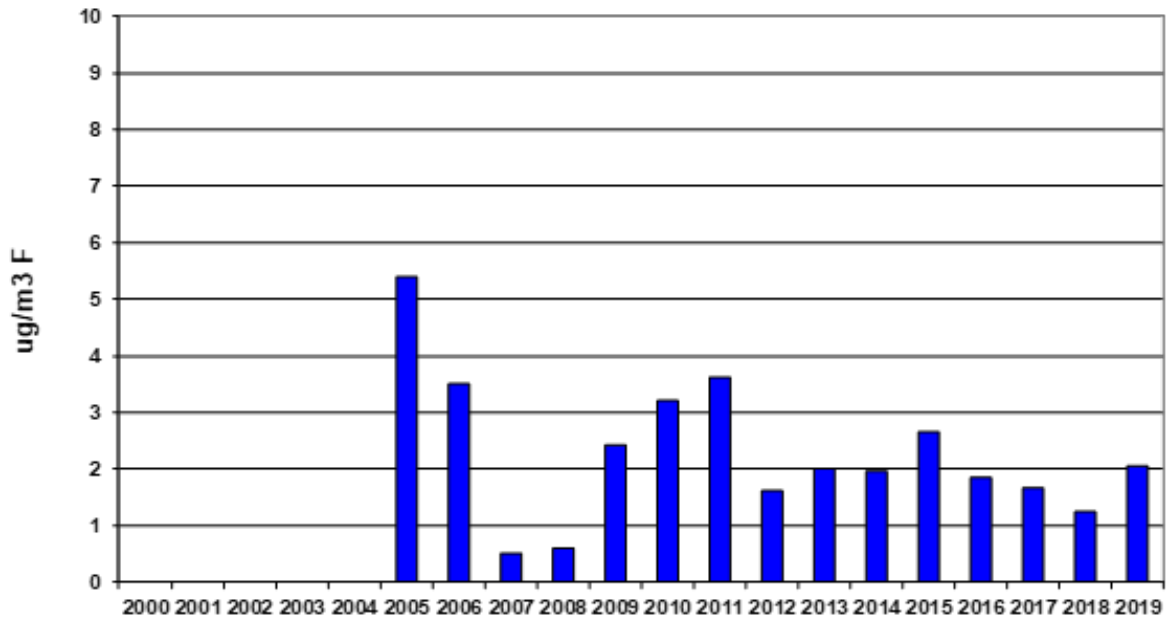
Christchurch Average Ambient Sulphur Dioxide



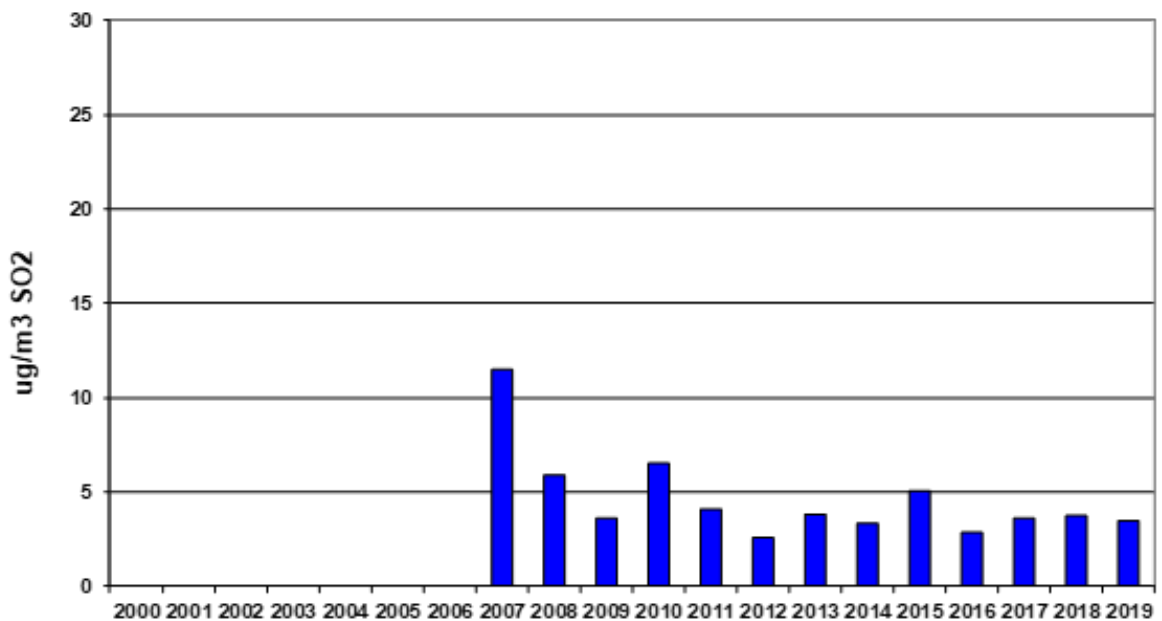
In mid 2014 the sulphuric acid stack height was increased to 67 metres, which has lowered the ambient SO₂ from the Christchurch plant.

Average ambient air levels

Napier Average Ambient Fluoride



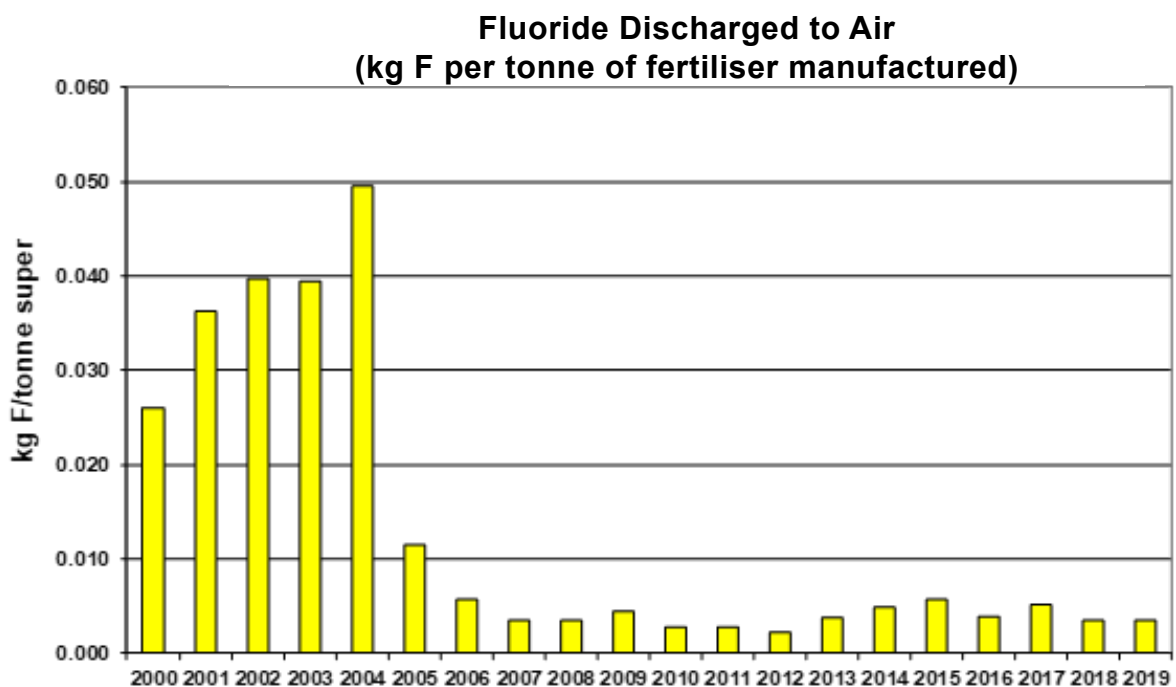
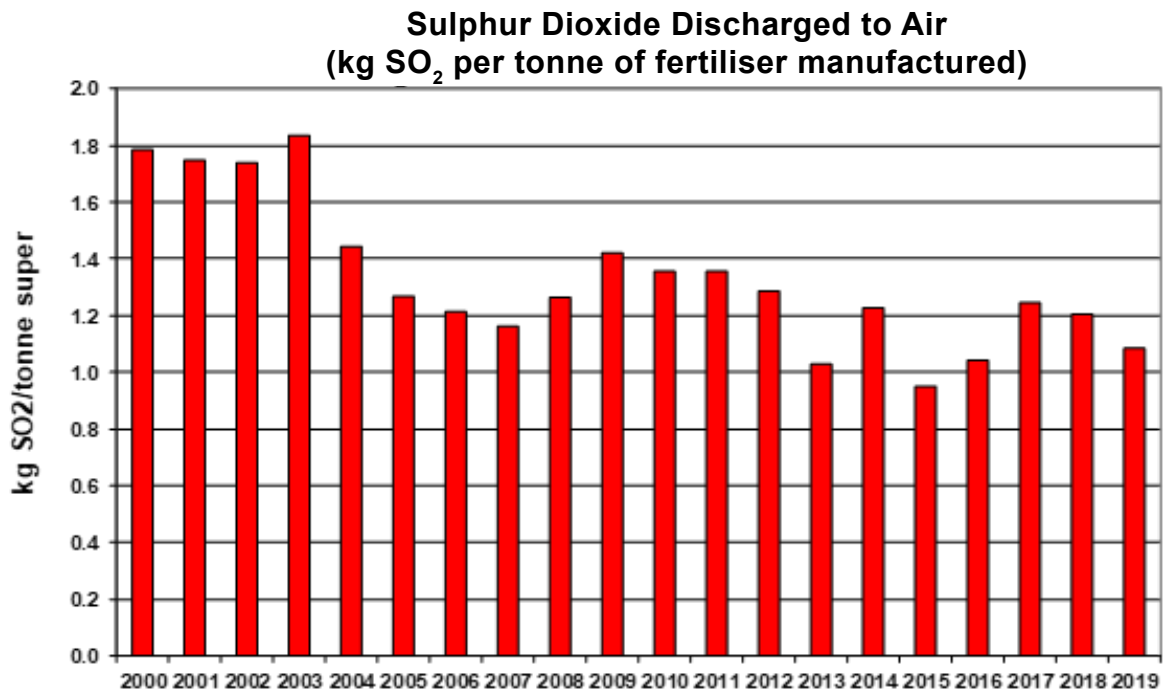
Napier Average Ambient Sulphur Dioxide



The ambient fluoride monitoring sites at Napier were modified due to the Resource Consent renewal processes; therefore it does not have the continuity of recording from any one monitoring site compared. Ambient monitoring of sulphur dioxide was introduced at the Napier site in the 2006-07 year.

µg/m³ = micrograms per cubic metre of air

Combined manufacturing discharges



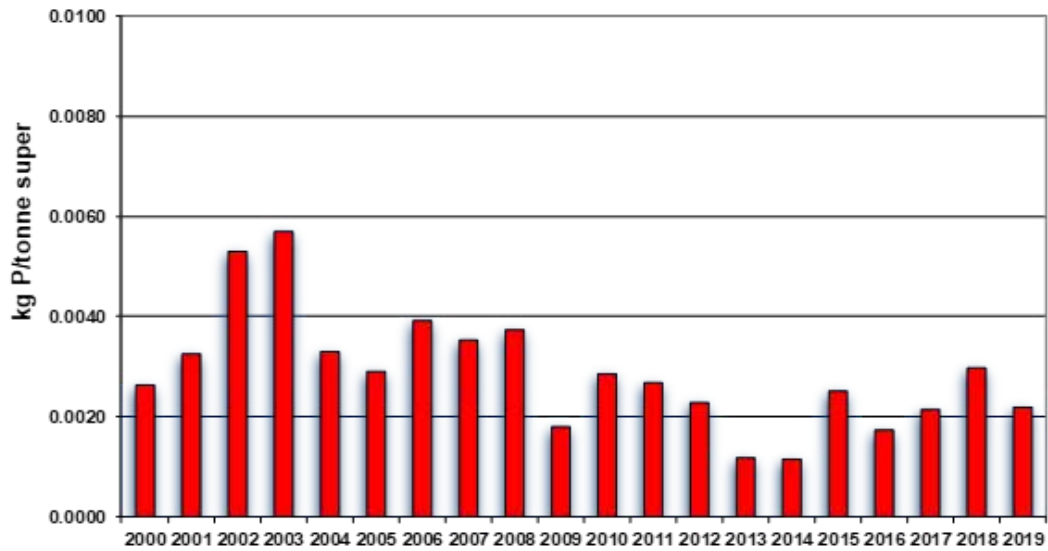
Total SO₂ discharges are influenced by the relative tonnages produced at each of the three Works.

The mass emission of fluoride per tonne of superphosphate is at a low level, reflecting the good performance of the scrubbers at all three sites. Phosphate rock blend changes can influence the discharge.

Combined manufacturing discharges

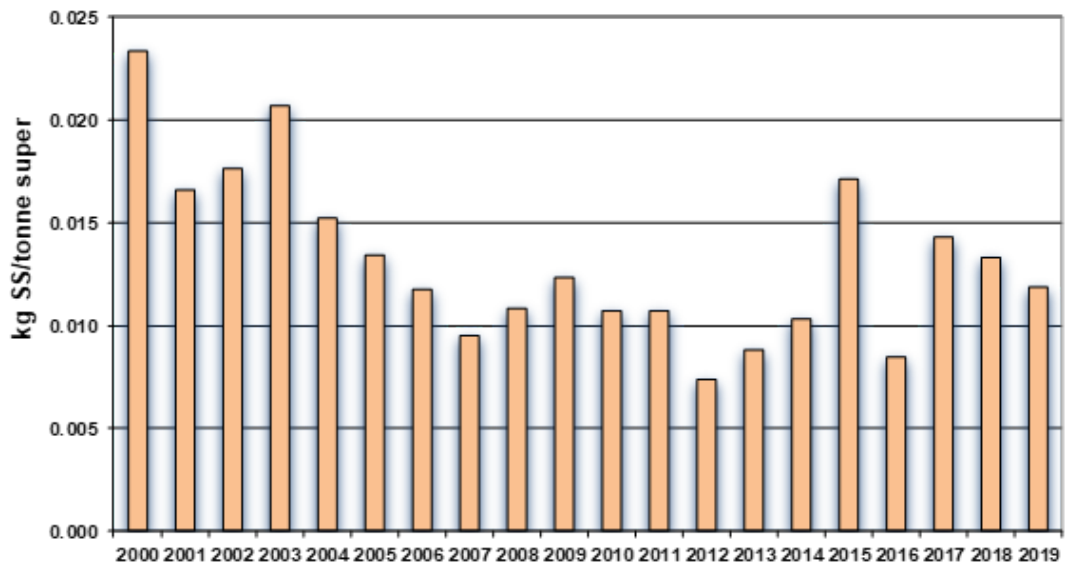
Phosphorus to water

Phosphorus Liquid Discharge



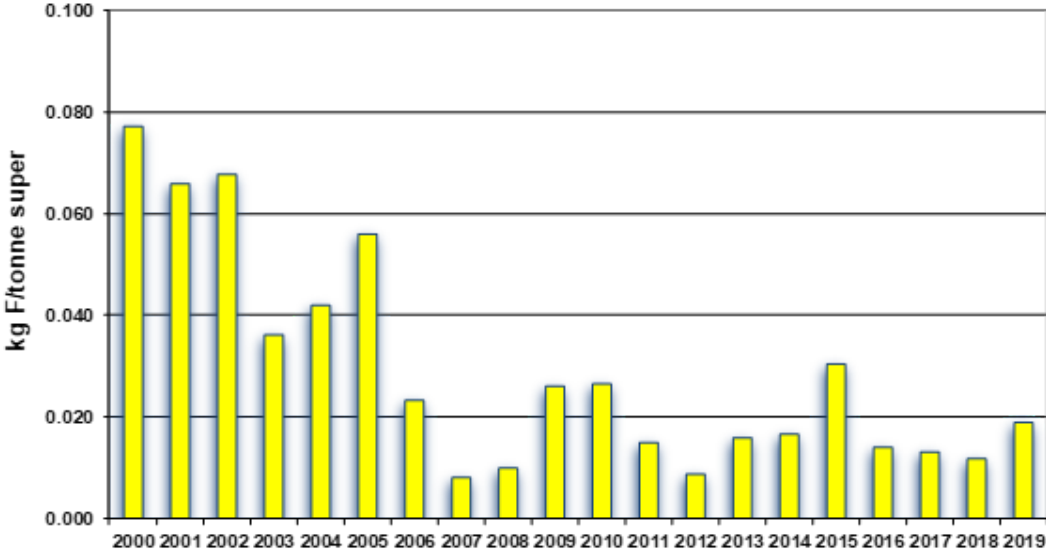
Suspended solids to water

Suspended Solids Liquid Discharges



Phosphorus to water

Fluoride Liquid Discharges



The 2019 lift in the combined sites discharges of Fluoride is influenced by new F recording for discharge to water at Christchurch.



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2018 / 2019 Edition