



Receives Only – No Decisions

Report To: Regional Direction and Delivery Committee

Meeting Date: 18 May 2017

Report From: Nick Zaman, Regulatory Compliance Manager

Air discharges in the Mount industrial area; Dust, Methyl Bromide, Hydrogen Sulphide and Sulphur Dioxide

Executive Summary

Public air quality concerns in the Mount Maunganui industrial area relate primarily to nuisance dust¹, exposure to industrial emissions (such as sulphur dioxide), and methyl bromide fumigation activity at the Port.

Monitoring data shows the Mt Maunganui and Sulphur Point industrial areas surrounding the Port of Tauranga are subject to periods of degraded air quality, which are transitory in time and location according to weather conditions. A number of activities which occur on Port of Tauranga land, are mostly managed under the “Permitted Activity” provisions of the Regional Air Plan, but can contribute to air-borne contaminants.

In addition, there are a number of industries with consented discharges to air. These include the use of methyl bromide (MeBr) and phosphine as fumigants on land owned by the Port of Tauranga, and discharges of sulphur dioxide (SO₂) and hydrogen sulphide (H₂S) from chemical and manufacturing processes in the Mount Maunganui industrial area.

To help assess the impact of these emissions the Regional Council has funded the installation of two independently maintained air monitoring trailers, one at the Whareroa Marae and the other at the Harbour Bridge Marina. These are in addition to the existing air monitoring trailer located on Totara Street.

Regional Council is in close contact with the agencies involved in managing and regulating the use of methyl bromide. On 10 May 2017 several Regional Council staff met with two representatives from WorkSafe, and two representatives (via video link) of the Environmental Protection Agency to ensure a clear mutual understanding of each other’s roles, functions, and position on methyl bromide fumigation and fumigation practise. Information is being readily exchanged between parties.

Staff have also been in regular contact with the Bay of Plenty District Health Board Medical Officer of Health over this issue. Council staff will be presenting at an upcoming Toi Te Ora team meeting to help raise awareness about work surrounding methyl bromide use.

¹ Nuisance dust refers to particulate matter which causes a nuisance visually and/or can irritate the eyes and respiratory system. It is a term widely used in air quality literature including the recently updated Ministry for the Environment’s *Good Practice Guide for Assessing and Managing Dust*, November 2016

Staff are also in regular contact with an industry group called STIMBR (Stakeholders in methyl bromide reduction), the Port of Tauranga, and the consent holder (Genera) regarding fumigation.

Staff will give an overview of how industrial discharges and specific directed monitoring (such as for PM 2.5) is being addressed in the Air Plan review.

A report on increased air quality monitoring will be presented to the Council workshop on the 19th May.

Recommendations

That the Regional Direction and Delivery Committee under its delegated authority:

- 1 Receives the report, Air discharges in the Mount industrial area; Dust, Methyl Bromide, Hydrogen Sulphide and Sulphur Dioxide.**

1 Introduction

This report is an update to the RD&D committee on the current situation with regards to air discharges with the greatest potential to impact on people in and around the Port and Mount industrial area. Compliance and enforcement actions undertaken to date have resulted in changes to some operations which have decreased discharges of some contaminants, however further work is required.

It outlines the key sources of air discharges, the main contaminants that have the greatest negative impacts on human health and the environment, and the compliance and enforcement work that has been undertaken by the Regulatory Compliance team to ensure industries causing discharges are operating within limits prescribed by consent conditions or national guidelines.

2 Air Discharges

2.1 Dust and airborne particulates

Airborne dust consists of particulate matter in the atmosphere. Particulate matter is the collective term used to describe very small solid, liquid or gaseous particles in the air. Some of these particles are big enough to be seen, while others are so small that they are invisible to the human eye and small enough to inhale.

Particulate matter includes total suspended particulates (TSP), which can be considered as anything smaller than 100 micrometres (μm) in diameter. Particles smaller than 10 μm in diameter are known as PM10. PM10 includes particles referred to as 'coarse' (between 2.5 and 10 μm) and 'fine' (less than 2.5 μm , also known as PM2.5).

It is the larger dust particles that are generally responsible for nuisance effects. This is mainly because they are more visible to the naked eye, and therefore more obvious as deposits on clean surfaces. These are also the particles that will settle most readily onto exposed surfaces.

TSP has been monitored at the Totara Street Air Quality Monitoring Station since August 2015; this monitoring is on-going. The monitoring builds on earlier information collated by council as part of an assessment of nuisance dust within the Mount Maunganui area.

The development of a Dust Reduction Operational Plan was supported by RDD in February 2015. The plan is part of a multi-pronged approach which includes:

- undertaking a comprehensive audit report of the Port of Tauranga in relation to nuisance dust
- developing a discussion paper on the reduction/mitigation options for the highlighted nuisance dust sources
- developing a management plan outlining reduction/mitigation implementation timeframes.
- identifying sources of dust emissions from Port of Tauranga activity and the wider Mount Maunganui/Sulphur Point industrial areas.

The first stage being the dust source audit at the Port of Tauranga has been completed and is expected to direct the other stages of the project.

The independent Port of Tauranga dust audit report identified multiple sources of nuisance dust. Sources were primarily associated with bulk cargo and log handling, unsealed areas and vehicle movements. The draft report identifies a number of recommendations the Port can undertake to reduce dust emissions and council officers are currently engaged with Port management to refine information on sources from estimates to actual volumes, and explore solutions.

The Port is currently in the process of developing an action plan which will outline specific monitoring they intended to undertake to identify all dust sources. It is planned to present the findings of the external consultants Port Dust Audit report and an overview of the port's actions at the RDD committee meeting on 22 June 2017, by which time the port will have developed their independent dust monitoring plan.

The Port have engaged Tonkin & Taylor and undertaken an independent professional review of the Dust Audit Report, which will help define a set of recommendations that can be implemented as the Port works towards developing an action plan.

3 Air quality complaint trends, May 2012 to May 2017

Public calls to the 24 hour Pollution Hotline have generally increased across the three charted parameters (dust, odour and smoke) in the past five years. The most noticeable increase has been in odour complaints, which are increasingly directed at one specific industry, being a pet food manufacturer operating in the Boeing Place area. Dust complaints rose between 2012 and 2014, however partially due to the tar-sealing exercise undertaken by the Port, there has been a flattening out of dust complaints in the past 3 years, refer Figure 1.

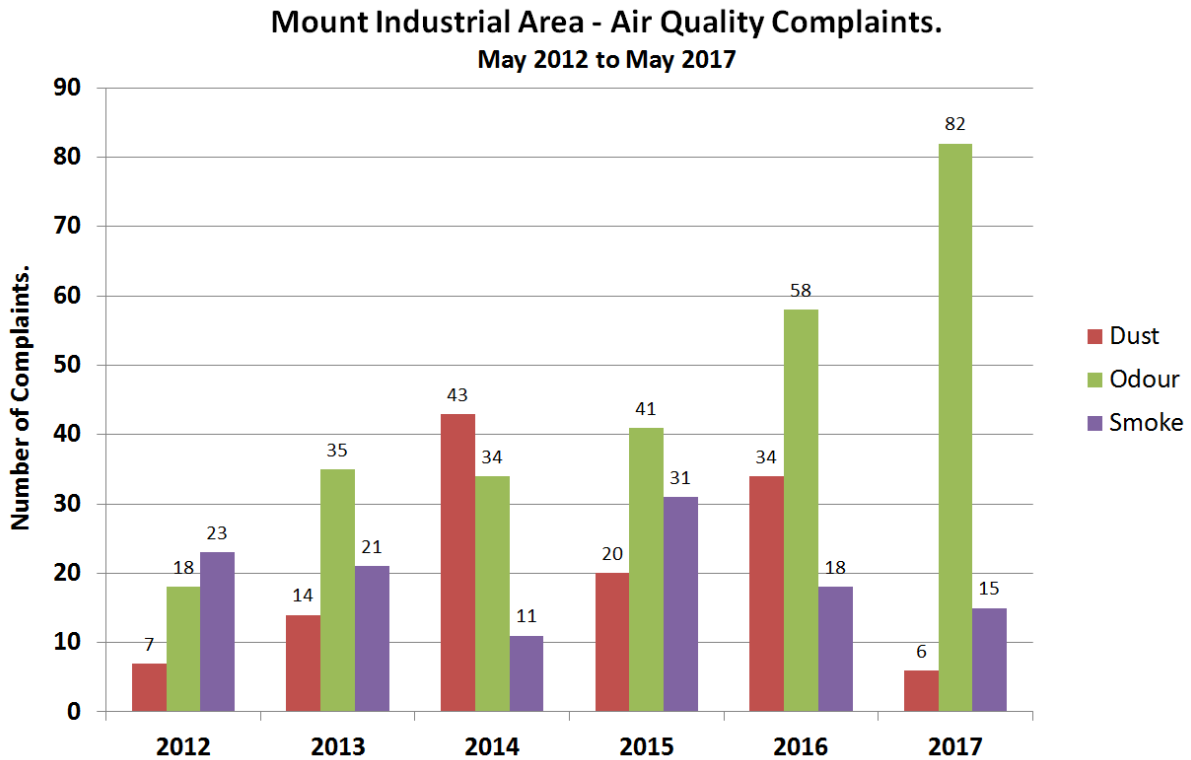


Figure 1: Trends in air quality complaints in the Mount Industrial area, 2012 to 2017

4 Methyl Bromide

Methyl bromide is an odourless, colourless gas used to control a wide variety of pests including fungi, and insects. It is extremely toxic to humans. High concentrations of methyl bromide can cause central nervous system and respiratory system failures and can harm the lungs, eyes, and skin. The tolerable exposure limit for the general public over one hour is 1ppm.

Methyl bromide was recognised as an ozone-depleting substance under the *Montreal Protocol on Substances that Deplete the Ozone Layer* in 1987. New Zealand, which ratified the Protocol in 1987, was required to phase out the production and consumption of methyl bromide by 1 January 2005, for all uses except 'quarantine or pre-shipment' (QPS) applications.

Public interest in the use of methyl bromide at the Port has been heightened by a recent Environment Court ruling, which upheld the decision of a Council's independent Commissioner to decline an application by a second company (Envirofume) to discharge methyl bromide at the Port.

In the Court decision, Judge Smith was critical about the extent of methyl bromide monitoring being carried out, and expressed no confidence that methyl bromide limits were being met. His comments included - "one would have anticipated that there would be constant ambient monitors throughout the Port.....to ascertain whether the residential levels of methyl bromide were within the safe range", and that "at this stage we can express no confidence that the current use of methyl bromide at the Port is meeting the standards set by

the EPA". Monitoring and enforcement of the EPA standard is the responsibility of the Ministry for Primary Industries, and Worksafe NZ.

Most methyl bromide is used to fumigate logs before they are exported to China and India to satisfy biosecurity requirements, however some is also associated with container and ship hold fumigation. Currently at the Port of Tauranga, most gas is vented to atmosphere once the fumigation process is complete; however 'recapture' of the gas is being progressively introduced to comply with consent requirements.

In some other New Zealand Ports, (e.g. Nelson and Wellington) all methyl bromide gas is recaptured following container fumigation. The Nelson community became particularly sensitive to the use of methyl bromide following six cases of people contracting motor neuron disease, all of whom had worked in the Port Nelson area.

The NZ Environmental Protection Authority (EPA) regulations requires that all methyl bromide fumigations are to be recaptured by November 2020, however some parties have expressed concern about the pressure the forestry industry may exert to extend this date as it approaches in order to allow release of MeBr to atmosphere to continue.

4.1 Methyl bromide use is controlled via a multi-agency approach

Ministry for the Environment (MfE)

MfE contributed to New Zealand's Meeting of the Parties to the Montreal Protocol held in New Delhi in 2006. They worked on the required phase-out of methyl bromide imports for the strawberry industry, in line with the expiry of the industry's critical use exemptions including 'quarantine and pre-shipment uses' (QPS), such as the fumigation of logs destined for China and India.

Environmental Protection Agency (EPA)

The Environmental Risk Management Authority, a forerunner of the EPA, developed a decision document governing the use of methyl bromide. This document, dated 28 October 2010 and amended under s67A of the HSNO (Hazardous Substances and New Organisms) Act on 1 June 2011, establishes rules for the storage, transport, use and recaptures requirements of methyl bromide.

The EPA has no direct enforcement arm but largely relies on WorkSafe New Zealand (WorkSafe) for this function.

WorkSafe

WorkSafe's functions include monitoring and enforcing compliance with work health and safety legislation, as well as providing guidance, advice and information on work health and safety.

They inspect workplaces to check on safety and health arrangements, investigate accidents at work, and makes sure employers and employees comply with health and safety legislation. WorkSafe focus on the health and safety of workers.

They carry out compliance monitoring of Genera's fumigation activity, to ensure that it complies with HSNO legislation.

Toi Te Ora

Toi Te Ora's key role is to deliver services that promote, protect and improve population health, prevent ill health and minimise the risk of disease and injury. Their focus is on the health of the general public rather than workers in particular. They may consider the levels of exposure the public have to different contaminants and comment publicly where appropriate.

4.2 Bay of Plenty Regional Council

Regional councils have responsibilities under s30 of the RMA for the control of discharges of contaminants to air, land and water.

Resource consents have been issued to a company fumigating in the Bay of Plenty, which control the discharge of methyl bromide to air. Consent conditions include requirements around signage, air monitoring, reporting, buffer distance and a staged introduction of recapture technology. The focus of the consents is on protection of members of the public rather than workers. Regional Council staff carry out site visits and compliance checks to ensure the resource consent conditions are being met.

Consent requirements are largely aligned with the HSNO requirements, however are in some cases more stringent, such as the schedule for recapture. Fumigators are required to comply with both the Regional Council consent requirements and the EPA HSNO requirements.

Genera are currently the only consented user of Methyl Bromide at the Port of Tauranga. Genera hold two fumigation consents with Council, one applying at the Port of Tauranga (62719) and the other (63371) elsewhere within the Bay of Plenty region. Since their consents were issued in 2005 / 2006 the amount of methyl bromide used in the Bay of Plenty has risen sharply to around 240 tonnes per annum. This represents about half of all methyl bromide used in the entire country. In 2014 BOPRC reviewed the Genera consent, imposing more stringent conditions and a staged recapture schedule. As a result, Genera is building capacity with additional staff, a mobile laboratory and six liquid gas scrubbers to meet the revised recapture schedule.

Genera have built a portable laboratory in a shipping container to enable it to:

1. Progress research of fumigant recapture
2. Accurately measure fumigant concentrations inside fumigation enclosures, and
3. Accurately measure fumigant concentrations near fumigation activities during fumigation and fumigation venting

The mobile laboratory is used by Genera on site at Maru Street and the Port of Tauranga or other sites where fumigating occurs. The mobile laboratory contains a gas liquid chromatograph (GLC). A GLC is the only method of reliably measuring methyl bromide levels under operational conditions and can be easily transported to site in a vehicle if necessary. The laboratory also contains two benchtop scale scrubbers used for research and development.

4.3 Compliance Actions

On 27 April 2016 Genera were issued with abatement in relation to not providing adequate notification prior to a ship being fumigated.

On 17 March 2017 the Council served an abatement notice on Genera Limited in relation to not meeting the fumigation recapture conditions of their resource consent.

A community group has been formed around the issue of methyl bromide use at the Port of Tauranga. There have been a series of public meetings and we have established a positive, open dialogue with the group. The group has recently presented Council with a LGOIMA request. A response has been provided for the main portion, however there remain some

outstanding items, including recapture data which is not due to be provided to Council by Genera, until later in the month.

Staff are also taking the following steps in response to the concerns raised:

Short-term response (can be implemented within 3 to 6 months) – Compliance monitoring and enforcement

- Increase the monitoring frequency, and scrutiny of monitoring information supplied.
- Use an independent commissioner for applications to vary consent conditions, or for any future fumigation consent applications, appeals and reviews.

Medium-term response (6 months to 1 year time frame)

- Increase use of hand held monitoring devices and assess whether establishment of permanent monitoring stations is a cost-effective option.
- Better understand the current barriers to implementing the recapture targets, as well as international best practise. A meeting has already been held with Nordiko, one of the largest providers of technology for the recapture of methyl bromide.
- Establish a Community / Port of Tauranga Users Liaison Group as a way to provide greater oversight and accountability with regard to port activities. This is a model that has been successfully adopted in other similar situations in New Zealand (for example, with regard to the operation of wastewater treatment plants).

Long-term response (1 or more years to implement)

- The consent held by Genera requires that recapture of the gas (in contrast to release to atmosphere) is progressively introduced, until all gas is recaptured by April 2019.

The review of the Regional Air Plan provides an opportunity to include more stringent policy and/or rules on the recapture requirements for methyl bromide or replacement alternatives.

5 Sulphur Dioxide

Some businesses in the area surrounding the Port have consented discharges of sulphur dioxide (SO₂) to air resulting from on-site processes. Consent holders include Ballance Agri-Nutrients, Waste Management NZ Ltd and Lawter (NZ) Ltd.

Over a number of years the Bay of Plenty Regional Council has received odour complaints from workers in the industrial area and residents living near-by. Apart from its distinctive odour, SO₂ has potential human health effects. Concerns have been raised about the health effects of gaseous discharges from surrounding industries on young children and elderly residents in the housing units linked to the Whareroa Marae, located immediately to the south of the Ballance fertilizer plant.

The Ministry for the Environment has developed a National Environmental Standard for Air Quality which places upper limits on ambient air quality to protect human health. For SO₂ these values are highlighted in Table 1.

Table 1. SO₂ National Environmental Standard

SO ₂ Value µg/m ³	Time Average	Details
350	1 hour	9 permitted exceedances in a 12 month period
570	1 hour	Not to be exceeded

Between Thursday 21 January 2016 and Sunday 27 March 2016, 8 exceedances of the NES were recorded, of which the never to be breached limit of $570 \mu\text{g}/\text{m}^3$ was exceeded on two occasions. An investigation showed a clear link between discharges from Ballance Agri-nutrients and elevated SO_2 detected at the Whareroa Marae air quality monitoring station.

As a result of the NES breaches, Ballance undertook capital works to improve discharge standards from their site, which has resulted in no further exceedances being recorded since March 2016.

Figure 2 shows prevailing wind direction as it relates to SO_2 intensity before and after Ballance implementing plant and process changes.

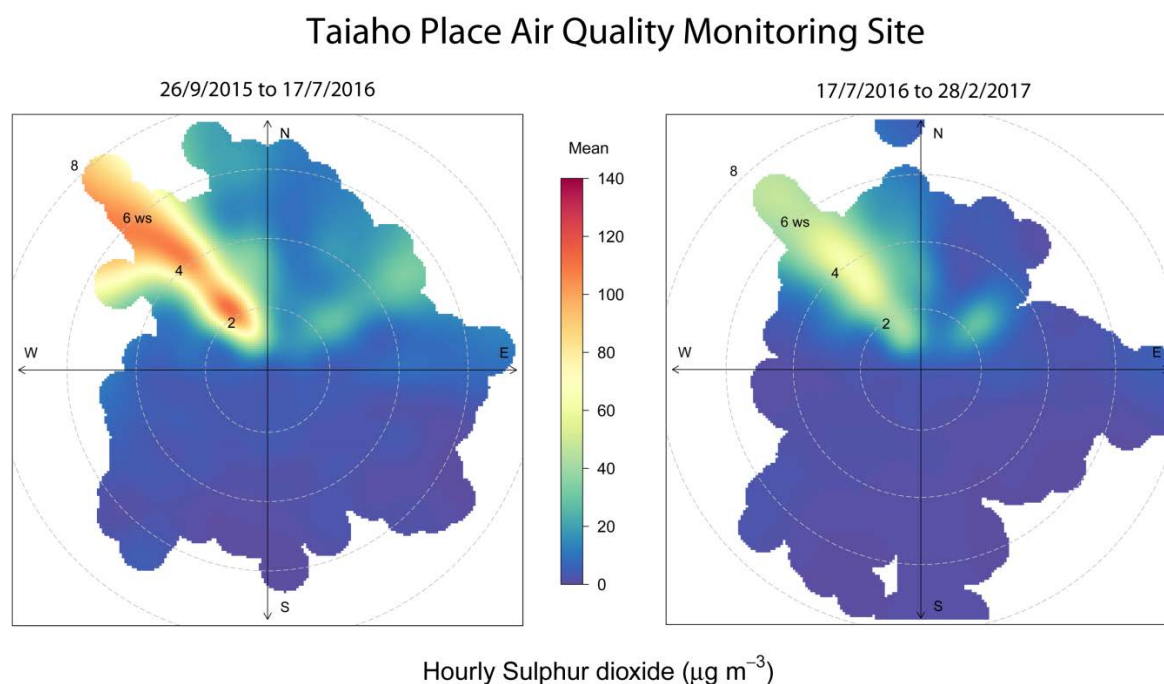


Figure 2: Wind pollution roses showing SO_2 intensity pre and post Ballance Agri-Nutrients site upgrade works.

6 Hydrogen Sulphide (H_2S)

H_2S is responsible for the characteristic ‘rotten eggs’ odour that most people would associate with geothermal areas. The odour can be detected at very low concentrations in air, and the level at which this first occurs is referred to as the odour threshold. This threshold varies from one person to the next, depending on individual sensitivities, age, state of health, and the conditions under which the odour is assessed.

The primary focus of this section due to the data values that have been recorded is the odour threshold for H_2S . When dealing with odour nuisance associated with H_2S the MfE Ambient Air Quality Guideline value of $7 \mu\text{g}/\text{m}^3$ (1 hour average) can be used. Figure 3 shows a pollution rose for the data collected at Taiaho Place. Higher values are associated with winds from the north-easterly quadrant (Figure 4), which captures discharges from the Waste Management oil refinery site which currently holds consent to discharge H_2S from its industrial processes.

Some elevated levels are also recorded when the wind direction is from the southerly quarter, this is not surprising as earlier work undertaken by Council has shown decomposing organic matter (such as sea lettuce) in an anaerobic setting can produce H₂S.

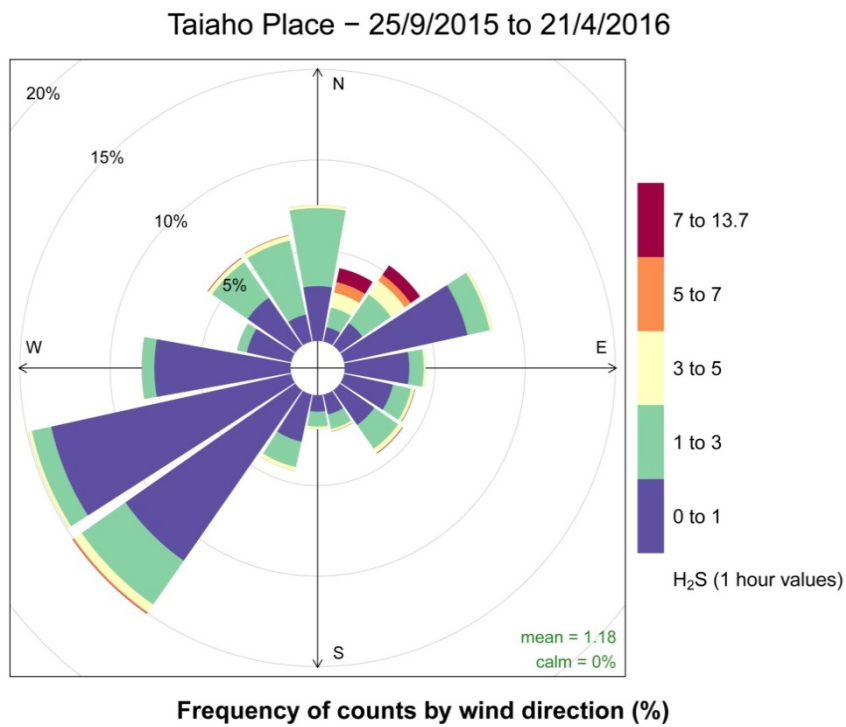


Figure 3: Pollution rose of H₂S values (1 hour average) recorded at Taiaho Place.



Figure 4: North east quadrant from which high H₂S values are recorded.

7 Conclusion

Degraded air quality negatively impacts on human health as well as causing environmental effects such as smog, odour and haze. Surrounding the Port of Tauranga on both the Mt Maunganui and Tauranga sides of the Harbour Bridge is a large area of multi-use industrial sites. Many of these sites emit contaminants to air as a result of either consented or activities managed under the “Permitted Activity” provisions of the Regional Air Plan. As industrial activity has grown, caused by the economic expansion of the city, so air quality in the locality has degraded, leading to an increase in public complaints, and a public expectation that the Regional Council will enforce controls on businesses to maintain acceptable air quality.

Recent monitoring has identified some sources of industrial discharges which are likely to be impacting on both human and environmental health. The emissions monitored have caused the council to issue a public notification regarding air quality issues, as well as brief the Ministry for the Environment.

The Regional Council is currently focussed on identifying all sources of air-borne contaminants and ensuring the businesses and industries responsible for these emissions are operating under best practice, as well as meeting all conditions of their air discharge consent, if one is held.

8 Council’s Accountability Framework

8.1 Community Outcomes

This project/proposal directly contributes to the Community Outcome/s in the council’s Long Term Plan 2018-2028.

8.2 Long Term Plan Alignment

This work is planned under Industrial Air Quality in the Long Term Plan 2018-2028.

Current Budget Implications

This work is being undertaken within the current budget for the Activity in the Annual Plan 2016/17.

Future Budget Implications

Future work on air quality compliance will be provided for in Council’s Long Term Plan 2018-2028. Costs relating to increased air quality monitoring will be presented to a council workshop by the Science Team on 19th May 2017.

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15 May 2017