

**AGENDA AND SUPPORTING PAPERS
FOR COUNCIL'S JUNE MEETINGS**

**TO BE HELD IN THE OFFICES OF THE WEST COAST REGIONAL COUNCIL
388 MAIN SOUTH ROAD, GREYMOUTH**

TUESDAY, 9 JUNE 2020

The programme for the day is:

10.30 a.m: **Resource Management Committee Meeting**

On completion of RMC Meeting: **Council Meeting**

Presentation: **Civil Defence Emergency Management**

Councillor Workshop: **Audit & Risk Committee – Charter and Membership**

RESOURCE MANAGEMENT COMMITTEE

THE WEST COAST REGIONAL COUNCIL

Notice is hereby given that a meeting of the **RESOURCE MANAGEMENT COMMITTEE** will be held in the Offices of the West Coast Regional Council, 388 Main South Road, Paroa, Greymouth on **Tuesday, 9 June 2020**

S. CHALLENGER
CHAIRPERSON

M. MEEHAN
Chief Executive Officer

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THE WEST COAST REGIONAL COUNCIL**MINUTES OF THE MEETING OF THE RESOURCE MANAGEMENT COMMITTEE
HELD ON 28 APRIL 2020, HELD REMOTELY VIA ZOOM DUE TO COVID-19
COMMENCING AT 12.00 P.M.****PRESENT:**

S. Challenger (Chairman), A. Birchfield, P. Ewen, D. Magner, B. Cummings, J. Hill, L. Coll McLaughlin, J. Douglas, F. Tumahai

IN ATTENDANCE:

M. Meehan (Chief Executive), R. Mallinson (Corporate Services Manager), H. McKay (Consents & Compliance Manager), H. Mills (Planning, Science & Innovation Manager), R. Beal (Operations Director), T. Jellyman (Minutes Clerk), S. Schumacher & J. Hawes (IT Support)

Cr Birchfield read the prayer.

M. Meehan advised that due to Covid 19 this meeting was held via Zoom and was live streamed via Council's Facebook page.

1. APOLOGIES

There were no apologies.

2. MINUTES

The Chairman asked the meeting if there were any changes to the minutes of the previous meeting.

Moved (Birchfield / Coll McLaughlin) *that the minutes of the previous Resource Management Committee meeting dated 10 March 2020, be confirmed as correct.*

Carried

Matters Arising

There were no matters arising.

3. PUBLIC FORUM

There was no public forum.

4. CHAIRMAN'S REPORT

Cr Challenger stated that he signed a document for H. McKay, but otherwise it was a quiet month.

5. REPORTS**5.1 PLANNING AND OPERATIONS GROUP****5.1.1 PLAN CHANGE 1 DECISION AND PLAN CHANGE 2**

H. Mills spoke to this report and advised that L. Sadler is present to assist should there be technical planning questions. He advised that this paper lays out the steps to move Plan Change 1 across the line and to capture the gains that have been made for landowners and the community. It also lays out the

steps to proceed into another plan change, Plan Change 2. H. Mills advised that the proposed Plan Change 2 would have the aim of removing all Schedule 2 wetland designations on private land, or at least, to attempt to. H. Mills advised that a project plan will be required to map out how this will be done and to work through the associated costs involved. H. Mills advised that an extension of time to the Plan Change 1 decision is required as it has lapsed under the RMA. He advised that the resolution that was made on 20 February now needs to be revoked. M. Meehan advised that a third of the committee wrote to him requesting this matter is placed on today's agenda requesting that the decision is revoked. H. Mills read out each of the recommendations. He advised that currently the environment court is not at full capacity due to Covid 19. H. Mills answered questions from Councillors.

Cr Birchfield advised he has a slight addition to recommendation 3. He read this to the meeting.

Moved (Birchfield / Hill) *That Cr Birchfield's amendment to recommendation 3 is included in the 3rd recommendation.*

*Against F. Tumahai, J. Douglas,
Carried*

Moved (Birchfield / Hill)

1. *That the report is received.*
2. *That the Resource Management Committee revokes the resolution of the 20 February 2020 meeting to reject the recommendation to adopt the Hearing Panel's Recommendations as the Council's Decisions on Submissions to the proposed Plan Change 1 to the Regional Land and Water Plan.*
3. *That the Resource Management Committee adopts the Hearing Panel's Recommendations as the Council's Decisions on Submissions to the proposed Plan Change 1 to the Regional Land and Water Plan, for public notification. A statement is included with the Decisions for notification, with words to this effect, advising that "By accepting the Hearing Panel's Recommendations, the current Council does not support the original Environment Court decision in 2011-12 which added 200+ scheduled wetlands to the West Coast Regional Plan, for various reasons. The Environment Court process also did not recognise and provide for Poutini Ngai Tahu cultural values and roles, including as kaitiaki over the designated wetlands on their land. The Environment Court process did not allow for private landowners impacted by the courts decisions to take part due to the constraints of the court process. Council will embark on a further plan change to rectify these issues, by allowing private landowners impacted by the Environment Court decision to submit and be part of the process. Council recognises that in accepting the Hearing Panel's Recommendations on submissions, this will bring relief and benefit to landowners and the sphagnum moss harvesters affected by the wetland designations."*
4. *That Council agrees to address the issues raised by Poutini Ngāi Tahu, regarding the Lake Kini wetlands at the 20 February meeting, in another plan change process, or (Plan Change 2).*
5. *That Council directs planning staff to create a project plan to map out the process of initiating Plan Change 2 to remove Schedule 2 wetland designation from private land.*
6. *That Council approves a further extension of time under section 37 of the RMA to release the Decisions on Plan Change 1 to the Regional Land and Water Plan, to when the Environment Court reopens.*

in favour Crs Coll McLaughlin, Hill, Birchfield, Magner, Challenger

Against J. Douglas, F. Tumahai, Cr Ewen, Cr Cummings

Carried

5.1.2 CONTACT RECREATION WATER QUALITY SAMPLING UPDATE

H. Mills spoke to this report and advised that there were no results of concern but there was moderate to heavy rain in the week prior to sampling.

Moved (Birchfield / Tumahai) *That the report is received.*

Carried

GENERAL BUSINESS

There was no general business.

The meeting closed at 12.24 p.m.

.....
Chairman

.....
Date

5.1.1

THE WEST COAST REGIONAL COUNCIL

Prepared for: Resource Management Committee – 9 June 2020
 Prepared by: Lillie Sadler – Planning Team Leader
 Jake Langdon – Hydrology Team Leader
 Date: 28 May 2020
Subject: Planning and Hydrology Report

Regional Policy Statement (RPS) update

The Environment Court decision on the RPS Mediation Agreements has not yet been released. The Agreements were lodged with the Court on 11 February 2020, however we expect some delays due to the Covid-19 lockdown.

Notification of Plan Change 1 Decisions

The Council's Decisions on submissions to the proposed Plan Change 1 to the Regional Land and Water Plan were publicly notified on 29 May. This starts the period for submitters to lodge any appeals on parts of the Decisions that they do not agree with. The Resource Management Act (RMA) requires a minimum period of 30 working days for appeals to be lodged with the Environment Court. In this case, the appeals period closes at **4pm on Monday 13 July**.

The Decisions documents and maps can be viewed on Council's website:

<https://www.wcrc.govt.nz/publications/regional-plans/regional-land-and-water-plan/regional-land-and-water-plan-proposed-plan-change-1>

Coastal Plan update

The development of the proposed Coastal Plan is delayed pending the release of the Environment Court's decision on the RPS. The Coastal Plan must give effect to the coastal provisions in the RPS.

Update on Plan Change 2 – Schedule 2 wetlands

Staff have obtained a quote for the ecological work needed to review the Schedule 2 wetlands, as part of developing a project plan for Plan Change 2. We now need to wait for the closure of the PC1 Decisions appeal period (13 July) to see if any appeals are lodged on boundary changes to any Schedule 2 wetlands. If this happens, it could be difficult to proceed with reviewing these wetlands until the appealed boundaries are resolved. We also need to wait for clear direction on the wetlands provisions in the freshwater package (NES, NPSFM, 360 Regulations), particularly regarding non-significant wetlands. The proposed 2019 freshwater National Environmental Standard (NES) had rules for activities in wetlands. Staff will ask the Ministry for the Environment (MFE) about the timeframe for releasing the final freshwater NES. Once we have the above information, we can prepare a project plan and cost estimate, and present it to Resource Management Committee (RMC), possibly at the August meeting.

Freshwater Management Unit Groups' update

Grey: Recommendations are being finalised, and will be presented to a RMC meeting in the next two-three months.

Kawatiri: The Group had its ninth and tenth meetings by Zoom on 6th and 19th May 2020. They will have two more meetings to finalise their recommendations. The Group aims to present them to Council in August or September.

Hokitika: At the March RMC meeting, the FMU Group members were approved. The first meeting that was due to be held later in March was postponed due to the Covid-19 lockdown. It will now be held in June.

Government direction on freshwater package

On 28 May the Government announced their direction for changes to the National Policy Statement for Freshwater Management (NPSFM), the new freshwater NES, and 360 Regulations for stock crossings.

These are outlined in a summary document titled "Decisions on the national direction for freshwater". The summary includes an action plan list of directions for the next 3, 5 and 5+ years. The action plan is attached to this report as Appendix 1. The full decision, and other documents related to the freshwater process, can be found at:

https://www.mfe.govt.nz/action-for-healthy-waterways?utm_medium=email&utm_campaign=Freshwater%20Package%20Announcement&utm_content=Freshwater%20Package%20Announcement+CID_e86094ca97cc20a17e2b52497db85219&utm_source=Email%20marketing%20software&utm_term=website

The final wording of the NPSFM, NES or 360 Regulations is not released with the decisions, however Appendix 1 of the Cabinet paper has more detail on the NES provisions:

<https://www.mfe.govt.nz/sites/default/files/media/Legislation/Cabinet%20paper/appendix-1-policy-and-recommendations-action-for-healthy-waterways-cab-paper.pdf>

MFE have prepared several information sheets for iwi/Maori, regional councils, farmers and horticultural growers. These can be found on the MFE webpage "Action for healthy waterways" through the above first link. Below is a direct link to the information sheet for regional councils:

<https://www.mfe.govt.nz/sites/default/files/media/Fresh%20water/action-for-healthy-waterways-information-for-regional-councils.pdf>

It includes timeframes for when the different parts of the policy and regulatory package must be met. Note that the NES wetland and streams provisions take effect immediately from gazettal, which is expected to be in July 2020, with the provisions taking effect 28 days after gazettal. Other policy and regulation are anticipated to be gazetted later this year.

We also note that the timeframes for notifying proposed freshwater plan changes and releasing decisions on submissions are pushed out to 2024 and 2026 respectively, to recognise delays caused by Covid-19.

The freshwater package is substantial. Staff will provide more detail on the main provisions affecting the West Coast for the July RMC meeting.

RMA Amendment Bill

The RMA Amendment Bill is one of several Bills being progressed under urgency through Parliament. It recently had its Second Reading, and includes a new streamlined freshwater planning process, whereby a government-appointed national freshwater commissioner will select a hearing panel for each regional council's freshwater plan changes, and the panel will make recommendations on submissions to councils. Councils can select 1-2 commissioners to be on the hearing panel. There are limits to appeals.

The Bill also requires councils to incorporate provisions into their RMA plans to recognise climate change.

Submission on NESAQ changes

The draft submission on the proposed changes to the National Environmental Standard for Air Quality (NESAQ) was circulated to the RMC, and amended to incorporate feedback. Attached as Appendix 2 is the final submission for the Council's approval. The submission period was extended to 31 July.

Update on Envirolink projects

The Council is allocated \$100,000 per year through Envirolink funding for specialist advice and investigation on resource management issues in the region, where we do not have the in-house expertise to provide this. For the current financial year, allocated funds were spent on:

- \$5,000 – Marrs/Bradshaw (Westport) on-farm improvement implementation, to implement recommendations from the Marrs Shingle project;
- \$20,000 – Roadmap to estimate and demarcate aquifer resource and surface water interaction – for the Grey FMU;
- \$20,000 – Groundwater in the Grey FMU;
- \$20,000 – Further investigation of the relationship between riverbed gravel takes and coastal erosion, to enable refinement of current precautionary approach to gravel takes;
- \$20,000 – Parrots Feather in the Kongahu: a trial of alternative eradication options (the trial was accidentally damaged, and needs to be redone this coming financial year);
- \$5,000 – Cobden Beach environmental impacts of coastal erosion;
- \$5,000 – Punakaiki Beach seawall benefits and impacts on the environment;
- \$5,000 – Pororari Beach seawall and coastal environment.

Towards the end of the calendar year, due to Covid-19, some of the other regional councils could not complete their projects so we obtained an additional \$80,000 of funding for:

- \$20,000 – Groundwater quantity allocation limits – case study of the Grey River for the Grey FMU;
- \$20,000 – Risk assessment of harmful aquatic organisms establishing in the West Coast coastal marine area, for the Coastal Plan review;
- \$20,000 – Reefton air quality data validation;
- \$20,000 - Air quality in Reefton – monitoring and trends data assessment.

Hydrology

Flood Warning

There were seven alarms during the reporting period as a result of four rain events.

Site	Time of peak	Peak level	Warning Issued	Alarm threshold
Hokitika Rv @ Gorge	28/02/2020 22:30	4689mm	28/02/2020 20:55	3750mm
Waiho Rv @ SH Bridge	29/02/2020 01:30	8787mm	28/02/2020 15:07	8000mm
Waiho Rv @ SH Bridge	03/03/2020 09:15	8944mm	03/03/2020	8750mm
Hokitika Rv @ Gorge	03/03/2020 17:20	4872mm	03/03/2020 16:37	3750mm
Hokitika Rv @ Gorge	13/04/2020 03:20	3782mm	13/04/2020 03:31*	3750mm
Hokitika Rv @ Gorge	02/05/2020 23:00	5082mm	02/05/2020 19:40	3750mm
Buller Rv @ Te Kuha	03/05/2020 11:55	7860mm	03/05/2020 09:01	7400mm

*This was a relatively minor event, the breach of the first threshold alarm coinciding very closely with the peak of the event.

Operations Under Covid-19

The Hydrology team continued to operate the Region's flood warning network throughout the lockdown period, under considerable additional health and safety restrictions owing to the circumstances. Under Level 4 and Level 3 restrictions, monitoring sites continued to be checked routinely to ensure the flood warning service was not interrupted, though a reduced maintenance workload was implemented. Under Level 2, the team has returned to near normal operation standards and has seen a number of staffing changes since we returned to office work.



Figure 1: Checking the primary reference at Mokihinui River, Welcome Bay



Figure 2: Site visit at Waiho River rain gauge and water level

RECOMMENDATIONS

1. *That the report is received.*
2. *That the Council approves the submission on the proposed changes to the National Environmental Standard for Air Quality.*

Hadley Mills

Planning, Science and Innovation Manager

Appendix 1

Action plan from now and within a generation

What will happen?



years

2020 – 2023

- Protection for wetlands, streams, and fish passage.
- Controlling poor practice in intensive winter grazing.
- Minimum standards for feedlots and stock holding areas.
- Interim intensification controls focusing on the riskiest activities.
- Reduce excessive nitrogen use through cap on synthetic fertiliser (190 kg N/ha/year).
- At-risk catchment programme (funded through Budget 2019).
- Farmer support programme and support catchment groups (funded through Budget 2019).
- From July 2023 all dairy cattle and pigs must be excluded from waterways more than a metre wide.
- Targeted rollout of mandatory and enforceable farm plans in catchments most at risk.
- Investing in new technologies and decision-support tools.
- The health and wellbeing of waterbodies and freshwater ecosystems is maintained or improved (including nitrogen and phosphorus).

Policy work continues to:

- consider whether there should be national bottom lines for dissolved inorganic nitrogen (DIN) and dissolved reactive phosphorus (DRP), that accounts for natural variation between different river types, in the National Policy Statement for Freshwater Management
- address fair allocation and Māori rights and interests in freshwater
- develop the operational requirements for freshwater farm plans
- develop greater central oversight of the performance of the freshwater management system and council performance, and
- review and make improvements to Overseer [an online software tool to improve nutrient management on farms].



years

Within five years

- Stock exclusion for cattle, pigs and deer in:
 - low-slope areas
 - some hill country wetlands
 - all areas where there are intensive practices.
- Minimum 3 m setbacks from rivers and streams.
- Mandatory and enforceable freshwater farm plans in place across most farms.
- Requirements for real-time measuring and reporting of data on water use enter into force in two, four and six years.
- A new planning process for freshwater - faster and nationally consistent regional plans.
- New or updated regional plans are notified by 2024, setting out how the region will implement the new National Policy Statement for Freshwater Management over coming decades - ie, to give effect to Te Mana o te Wai, with an emphasis on ecosystem health, reinforced by the addition of new attributes; achieve national bottom lines and community objectives over the long term; and set out the rules needed to do this.



within a generation

From five years to a generation

- Mandatory and enforceable freshwater farm plans in place for all commercial farms.
- Communities work towards meeting the requirements of their freshwater plans (different requirements for each region/area).
- Freshwater is recovering and on track to meet national bottom lines and community aspirations.

Appendix 2

29 May 2020

Ministry for the Environment
PO Box 10362
Wellington 6143

Dear Sir/Madam

West Coast Regional Council's submission on National Environmental Standards for Air Quality (2020) changes

The West Coast Regional Council appreciates the opportunity to submit on the proposed amendments to the National Environmental Standards for Air Quality (NESAQ). While we support in principle the improvement in air quality to benefit the health of our communities, we note our concerns regarding the proposed restrictions on multifuel burners, and the lack of provision for future technology that may enable coal burners to meet emission standards.

Our contact details for service are:

Lillie Sadler
Planning Team Leader
West Coast Regional Council
Po Box 66
Greymouth 7840

Phone: 03 768 0466 ext 8242

Email: ls@wcrc.govt.nz

Please contact us if you have any questions regarding the content of our submission.

Yours faithfully

Michael Meehan
Chief Executive

Introduction

The West Coast Regional Council (WCRC or the Council) supports in principle the intent of the proposed changes to the National Environmental Standards for Air Quality (NESAQ) to improve air quality where this is necessary for human health, particularly respiratory health. However, we are extremely concerned that the proposed changes to the standards for domestic burners will have perverse economic and social impacts on the people and communities of the West Coast through the inability to burn coal.

Over the past year, Government has proposed, and in some cases now implemented, significant changes to legislation. This includes the requirements of the proposed Freshwater Package, the whitebait refuges and fishing closures, and the National Policy Statement for Indigenous Biodiversity. The NESAQ, and other central government legislation, will financially impact West Coast communities and people, arguably some of the most deprived in New Zealand, further compromised through the impact of Covid-19.

Our submission on the proposed changes to the NESAQ is in two parts. Part 1 outlines the West Coast context, including the use of coal for heating on the West Coast and the Reefton Airshed. Part 2 of this submission outlines the Council's response to the questions in the Discussion Document that are relevant to the West Coast region.

Part 1: The West Coast Context

The West Coast is the wettest region in New Zealand with average yearly rainfall totals of between 1,746mm to 11,228mm¹. This makes the West Coast a damp place to live. Efficient heating is extremely important to ensure that people are not living in damp, mouldy homes.

High deprivation is evident in areas that have lower population densities and no significant industry in the area. The history of the West Coast has been based on extractive industries including mining (coal and gold) as well as forestry and saw milling. Communities throughout the region have struggled as these sectors, and others, have contracted in recent times. The Buller District, including Reefton, is an example of such an area. With less disposable income, people have challenging decisions to make on how to spend this with improving insulation in their homes often foregone due to other pressing day to day expenses and priorities.

Mean income, and income growth, lags behind the national average at \$54,000 and 2.9%, compared with \$60,000 and 3.7%, as of 2018. Housing affordability is three times better than the national average. Rental affordability, while a third better, is closer to the rest of New Zealand when compared with house prices.² **Error! Bookmark not defined.**

Deprivation indices for the West Coast indicate moderate to low deprivation in areas where there is significant agricultural activity. This is particularly apparent in the Hokitika and Grey Valley areas.

Use of coal for heating on the West Coast

A large proportion of West Coasters use coal for heating because it is cheap and easily accessible. The West Coast has approximately 10 active coal mines, and another half a dozen that are currently being rehabilitated.

Local people often prefer the use of coal over wood, especially the older demographic, as once the coal has been delivered it can be immediately used on the burner. In comparison, wood often needs to be cut into smaller pieces and dried before it can be used properly. Coal burns hotter than wood when a solid fuel burner is operated correctly, heating homes faster, and to a higher temperature, than other forms of heating. It is therefore the preferred fuel for many on the West Coast.

¹ West Coast State of Environment Report 2018 - <https://www.wcrc.govt.nz/environment/state-of-environment>

³ <https://ecoprofile.infometrics.co.nz/>

The Reefton Airshed

Reefton is the only West Coast town that has a gazetted airshed. The town is mostly surrounded by hills, causing an inversion layer on still nights whereby emissions are unable to disperse upwards. A map of the airshed is included at Appendix 1. Reefton is a sub-alpine town that has numerous days in winter where temperatures fall below 0 degrees Celsius². Snow can on occasion fall in the town. Fog is also a major issue, with the town having 62 fog days per year, of which 42 days are between May and August³. Foggy conditions are indicative of high humidity, and when combined with cold, increase the need for home heating. It is over these winter months that air quality is at its worst because there are more people operating their fires for longer periods in order to reduce ill health and damage associated with damp homes. Prolonged exposure to mould results in major health impacts. Therefore, in Reefton, it is particularly important for people to be able to efficiently and effectively heat and dry their homes. Furthermore, Reefton can be subject to unplanned power outages over the winter months and it is important that people are able to heat their homes during these times.

Monitoring of PM₁₀ in Reefton has been undertaken since the early 2000's as required by the current NESAQ. In 2019, air quality consulting firm Environet Limited completed an emissions inventory on air quality in the Reefton Airshed. The report found the following:

- PM₁₀ concentrations exceeded the NESAQ of 50 µg/m³ over a 24 hour period numerous times during the winters from 2006 to 2016.
- Domestic heating was the main source of winter PM₁₀ and PM_{2.5} emissions in Reefton accounting for 98% of the daily winter PM₁₀, 96% of the annual PM₁₀, 98% of the daily winter PM_{2.5} and 97% of annual PM_{2.5} emissions.
- Multi fuel burners were the most common method for heating the main living area in Reefton's dwellings, with 62% of households using this form of heating (57% of these using coal).
- Electricity was also common for home heating with 44% of households using this method.
- A further 23% of households used dedicated wood burners.
- Many households used more than one method to heat the main living area of their home.
- Other sources include outdoor burning, industry and motor vehicles at 1% of daily winter PM₁₀.
- On an average winter's night, around 145 kilograms of PM₁₀ are discharged into the air.

Part 2: Consultation document on "Proposed amendments to the National Environmental Standards for Air Quality"

General comments

In general, Council supports in principle most of the proposed changes to the NESAQ as they contribute to improving air quality for the benefit of people's health. We have responded to Questions 1, 2, 4-6, and 21 on this matter.

Our key concern is that the proposed changes to burner standards, which effectively bans the use of coal for domestic heating, will have adverse economic, social and health impacts on low-income households within our communities. We also disagree with making the emission standard for individual burner design more restrictive. These concerns are expanded on in reference to Questions 11, 13 and 14.

² The Climate and Weather of West Coast 2nd edition, NIWA, G. R. Macara, 2016

³ The Climate and Weather of West Coast 2nd edition, NIWA, G. R. Macara, 2016

What is being proposed – particulate matter

Introduce PM_{2.5} as the primary regulatory tool to manage ambient particulate matter

Questions

Q1. Do you agree the proposed PM_{2.5} standard should replace the PM₁₀ standard as the primary standard for managing particulate matter?

We **support** replacing the PM₁₀ standard with the PM_{2.5} standard as the primary standard for managing particulate matter in ambient air quality (outdoor air quality). This change aligns the NES with the World Health Organisation's review of health impacts of particulate matter. Research shows that particles in the air that are smaller than 2.5 micrometers in diameter (PM_{2.5}) are more hazardous to people's health than coarse, larger particles (PM₁₀). Our Council has already installed a new air quality monitoring machine in Reefton that measures both PM_{2.5} and PM₁₀. This will allow us to continue our long term PM₁₀ data set as well as establish a new PM_{2.5} dataset. Once 5 years' worth of valid PM_{2.5} data has been collected, Council will be able to transition to this as the primary standard.

Q2. Do you agree we should include both a daily and an annual standard for PM_{2.5}?

We **support** having a daily and an annual standard for PM_{2.5} as they cover acute and chronic exposure to air quality pollutants which can be harmful to human health. Having said that, in Reefton, air quality is only an issue during the winter months and so the daily standard will be more relevant to ensure that air quality in Reefton is closely monitored over these months.

Q4. Do you consider your airshed would meet the proposed PM_{2.5} standards? If not, what emissions sources do you expect to be most problematic?

We are unsure whether the Reefton Airshed will meet the proposed PM_{2.5} standard of 25 µg/m³, with three or fewer exceedances allowed in a 1-month period. We have only recently (October 2019) started monitoring PM_{2.5} in the Reefton Airshed. Not enough data has been collected to understand PM_{2.5} emissions in Reefton, especially as this data is yet to be collected over the winter months when emissions are higher. Until this has been collected we will not know whether the Reefton Airshed is likely to meet the proposed PM_{2.5} standard.

Retain the PM₁₀ standard with reduced mitigation requirements for breaches

Questions

Q5. Do you agree councils should be required to keep monitoring and managing PM₁₀?

We **generally support** councils being required to keep monitoring and managing PM₁₀. In the shorter term, continuing to collect PM₁₀ data will enable us to report if there is a breach of the PM₁₀ standard until there is adequate and meaningful PM_{2.5} data to accurately and reliably identify if there is a breach of the PM_{2.5} air quality standard. It will also provide for a transition period over which we can investigate the possibility of carrying out further work to determine the accuracy of the new Teledyne T640x air quality monitoring machine which measures both PM_{2.5} and PM₁₀.

Q6. What would be the additional costs involved in retaining PM₁₀ monitoring alongside PM_{2.5} monitoring, versus the potential loss of valuable monitoring information?

Beyond the adoption of PM_{2.5} monitoring and standards, there will be an additional cost to councils in order to operate equipment that can measure PM₁₀, including factors such as instrument maintenance, calibration, and processing data to a high standard.

What is being proposed – domestic solid-fuel burner standards

Tighten the emissions standard

Questions

Q11. Do you agree with the proposal to reduce the emissions standard to no more than 1.0g/kg? If not, what do you think the standard should be?

We **strongly disagree** with this proposal as we question how much improvement in air quality the proposed standard will achieve. The reason provided in the Discussion Document for making the emissions standard for individual burners at the design stage more restrictive than the current 1.5g/kg appears to be because there is improved wood burner technology that can meet the new standard, rather than for any other reason. This is akin to 'let's do it because we can', which is not a robust or valid reason for making the standard more restrictive. The supporting documents, such as the cost benefit analysis, do not provide any additional justification for reducing the standard to 1.0g/kg.

Although it seems logical that a lower standard for individual burner emissions will improve air quality, before a decision is made, clear evidence that the change will have a considerable impact on improving air quality should be provided, in order to justify the costs. If the evidence does not show major air quality improvement, or that the costs substantially outweigh the benefits, then we **oppose** changing the standard to 1.0g/kg, and **support** maintaining the current standard of 1.5g/kg.

In addition, making the emissions standard for the design of burners more restrictive makes it even harder for future multi-fuel burner design to meet it. The new standard inhibits innovation and advancements in multi-fuel burner technology.

The new standard will not provide for innovative devices that can be attached to multi-fuel burner flues to reduce emissions to meet the national standard. This is discussed further in our response to Questions 13 and 14 below.

All domestic, solid-fuel burners to meet the emissions standard

Proposal

*8. Include all types of solid-fuel burners under the existing burner regulations that prohibit discharges from newly installed, domestic burners unless they meet the emissions limit and thermal efficiency standards. This would include **all** types of domestic, solid-fuel burners such as wood burners, coal burners, multi-fuel burners, pellet burners, open fires, space heaters, cookers and water boilers.*

Question

Q13. Do you agree the new emissions standard should apply to all domestic, solid-fuel burners newly installed in properties less than two hectares in size?

We **agree in principle** that the emissions standard should apply to all domestic, solid-fuel burners newly installed on properties less than two hectares in size. This will contribute to improving air quality and the health of people in built-up areas in our region. However, we are **extremely concerned** that the standard, as proposed, will effectively ban the use of coal for the heating of homes. There are currently no burners on the market that can burn coal and meet the proposed standard. This is concerning given the quantity of low-income West Coast homes burning coal for their heating. The costs of burning coal vary among the community depending on contacts, and the ability to collect and store wood. However, it has high value to a significant part of the community. Without this fuel source, those on low incomes may be unable to heat their homes without considerable financial assistance to install other forms of heating such as heat pumps, as well as insulation, both of which cannot heat such places as effectively. The versatility of multifuel burners are important in allowing people to maximise the availability and price of coal and wood, given that availability and price will vary.

We **strongly support** the proposal that the emissions standard for individual coal and multi-fuel burners will only apply when someone is replacing their burner, or they are building a new house. See our further comments under Question 21.

Q14. Do the current methods to measure emissions and thermal efficiency need updating or changing? For example, to address any trade-off between thermal efficiency and emissions, or to test other types of burners or burner modifications that seek to reduce emissions?

The emissions standard, and possibly the methods to measure emissions and thermal efficiency for burner design, need amending to provide for the use of devices that help reduce emissions to meet the design standard. There are burner devices that can help reduce emissions from solid-fuel burners, including multi-fuel burners where coal is used. Our Council has investigated the option of using OekoTubes to reduce emissions from burners in Reefton homes that burn coal. The OekoTube technology employs a steel rod attached to an electrical circuit box at the top of the flue with the rod inserted inside the flue. A low electrical current travels through the rod and charges the particulate matter so it clusters together into larger particles. These particles either attach to the flue wall or drop down into the firebox resulting in fewer emissions discharging out the top of the flue. Appendix 2 shows a diagram of the OekoTube and photos of the device attached to a burner flue on a roof.

A laboratory trial was undertaken in January 2014 to determine the percentage reduction of PM₁₀ by the OekoTube on a coal, and coal and wood (50:50), fire. Attached as Appendix 3 is a copy of the lab trial report. The results indicated a 90-97% reduction when the fire was operated at low burn setting, and approximately 58% reduction in total emissions across all the trialed burn cycles,⁴ although the actual reduction could be higher in the colder Reefton air temperatures. The lab trial results give a positive indication that the ESP filter on domestic burners may be sufficient to achieve the NES for PM₁₀ in Reefton, in tandem with other methods. We are not aware of any trials of the OekoTube on coal burning for PM_{2.5}.

An independent review of the lab trial results identified that *"the OekoTube was most effective at reducing particulate emissions when the fire was operated at low burn setting (90-97%)....(it) had reduced effectiveness.... when bituminous coal was used,....and if the use of an ESP device such as the OekoTube is included as a regulatory tool for managing PM₁₀,....Council would need to be satisfied that the OekoTube can be adequately operated and maintained such that its effectiveness in reducing PM₁₀ is perpetual."* A copy of this evaluation is attached as Appendix 4. It may be the case that devices attached to coal burners can reduce PM_{2.5} to be near the emissions standard, and this, in conjunction with other regulatory provisions such as prohibiting certain types of coal, and proper burner operation, will together meet the standard. We **strongly seek** the NES to provide for this.

A trial was also undertaken to check the operation and maintenance of an OekoTube filter on two household burners in Reefton in May 2014. The purpose of this trial was to identify how well the OekoTube runs mechanically in live conditions. The trial identified that: *"The ESP filter has clearly retained soot dust containing PM₁₀ within the flue almost continually over winter without any major malfunctions, confirming that it does operate well in real life conditions on coal and coal-wood fires. The minor build-up of soot dust on the flue wall did not interfere with the safe operation of the burners....On-site testing has proved to be very valuable in identifying some minor maintenance and operational matters that will improve use of the ESP device."* The report on the field trial is attached as Appendix 5.

Although the lab trial measured the reduction of PM₁₀ emissions, given the potential social and health impacts on West Coast people of the new emissions standard for individual burners, central government should support and encourage the use of innovative burner modifications and devices that reduce emissions, in combination with using other tools in regional plans. As a starting point, Government should provide funding for further trials on devices such as the OekoTube on coal, and coal and wood burners, to determine how much PM_{2.5} is reduced, and how much other tools can help reduce emissions to meet the national standard. Over time, technology may be developed that will allow people to burn coal and still meet the standard.

⁴ Wilton, E. February 2014. Evaluation of the effectiveness of the OekoTube ESP in the management of PM₁₀ in Reefton.

Government policy and regulation should not stifle future innovation in solid fuel burner design to the detriment of the most vulnerable within our communities.

Outcomes sought:

1. Central government to provide funding for further trials on devices that can be added to solid fuel burners that burn coal, to determine whether the use of these will result in the burner meeting the emissions standard.
2. Amend the standard to allow approved devices to be fitted to solid fuel burners. These approved devices would be tested to confirm that fitting them to a burner that is burning coal will ensure the burner meets the required standard.
3. Maintain the current emissions standard of 1.5g/kg.

Timing, implementation and transitional provisions

Questions

Q21. Do you agree that lead-in times are required for starting to monitor PM_{2.5} and for burners that will no longer be compliant? What lead-in times would you suggest and why?

We **strongly support** lead-in times for monitoring PM_{2.5}. In 2019 we purchased a new machine that measures both PM_{2.5} and PM₁₀. Monitoring of PM_{2.5} only began in October 2019, and so more time will be needed to collect enough data to ensure it is accurate before Council starts notifying breaches. The proposals do not provide clear direction on lead-in times. However, paragraph 4 on page 27 of the Discussion Document suggests that a minimum of 12 months of data for PM_{2.5} would need to be collected before the Council could notify any breach. Since we already monitor, and can continue monitoring PM₁₀, we can use this data to manage air quality in Reefton until we have 12 months of data for PM_{2.5} for breaches, and five years' worth of PM_{2.5} data to determine whether Reefton remains a polluted airshed.

We **strongly oppose** adding lead-in times to the NES to replace non-compliant burners with low-emission burners. A lead-in time will place significant financial burden on low income households to replace their burner earlier than anticipated, meaning they have less time to save up to pay for the new burner.

We **strongly support** requiring burners to only be replaced when they need replacing. This will mean that the standard will not apply for some West Coasters for a number of years, given that the average lifespan of a multi-fuel, or coal burner is 20-25 years. People who have just replaced their burners should not be unreasonably required to replace their 'newish' burner. Replacing burners is a substantial financial undertaking by the landowner. Having no lead-in times to replace burners in the NES also allows Councils the ability to set their own timeframes to replace burners if air quality is a significant issue in particular parts of their region.

Part 3: Non-regulatory tools

The NESAQ should not be implemented in isolation. There are other non-regulatory tools which the Government needs to action as a whole of Government approach to improving air quality and the health of our population, as well as minimising the economic and social impacts on low-income households. We **strongly recommend** that MfE and EECA visit low-income communities throughout the West Coast, including the Reefton Airshed, to educate communities about the NESAQ changes regarding replacing burners, and the Warmer Kiwi Homes Scheme.

We **strongly support** the Scheme which provides 90% of the cost of insulation and/or cleaner heating appliances. This Scheme is available to low-income households until 2023, but this timeframe could be too short for low-income households to save up for the remaining 10% of the cost. The Scheme should be extended until at least 2025.

While we support the use of 'clean heating', such as low-emission wood burners and heat pumps, we are concerned that the high price of electricity on the West Coast makes these options

potentially more expensive than in other regions.⁵ A large percentage of electricity consumed on the West Coast is imported from outside the region, and the distance to transmit this electricity to the region adds significant cost in comparison to that of other regions. There are robust potential hydro electricity generation opportunities on the West Coast. In tandem with the NESAQ changes and the climate change response legislation, the Government needs to reconsider allowing the generation of cleaner hydro electricity within the region, to make 'cleaner heating' for West Coast households more viable.

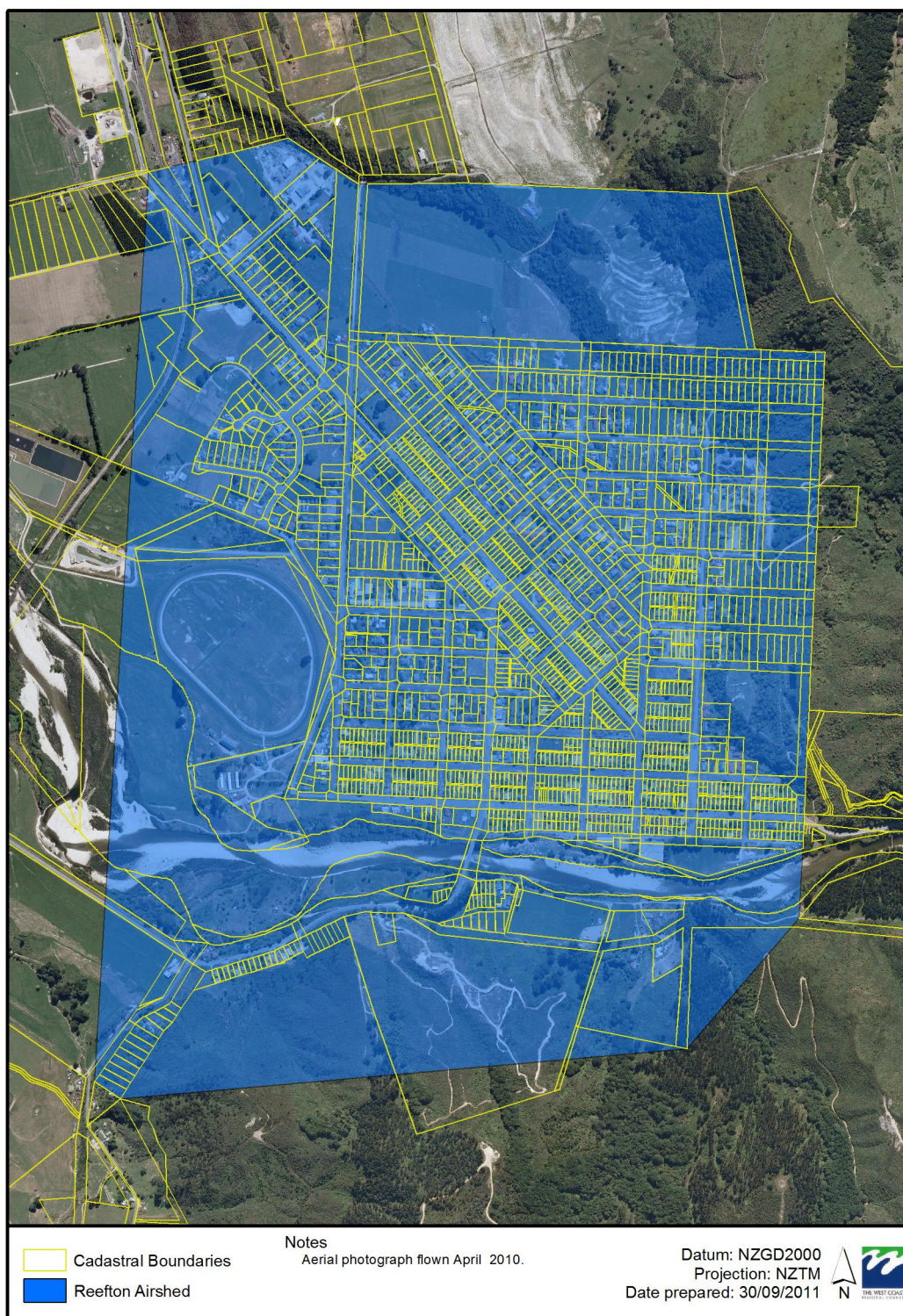
Outcomes sought:

1. MfE and EECA visit low-income communities throughout the West Coast, including the Reefton Airshed, to educate communities about the NESAQ changes regarding replacing burners, and the Warmer Kiwi Homes Scheme.
2. Extend the Warmer Kiwi Homes Scheme to 2025.
3. Provide for increased hydro electricity generation within the West Coast.

This ends our submission.

⁵ The figures indicate a potential annual additional cost for an average West Coast household in the Westpower area of \$110.53 (pers comm, M Kennedy, Consultant Planner for Westpower, 1/4/2020). For averaging on a regional basis, go to this link: https://www.emi.ea.govt.nz/Wholesale/Reports/4GS02J?DateFrom=20200318&DateTo=20200318&rsdr=D1&si=dr_DateFrom|20190319,_dr_DateTo|20200318,_dr__rsdr|L364D,v|4

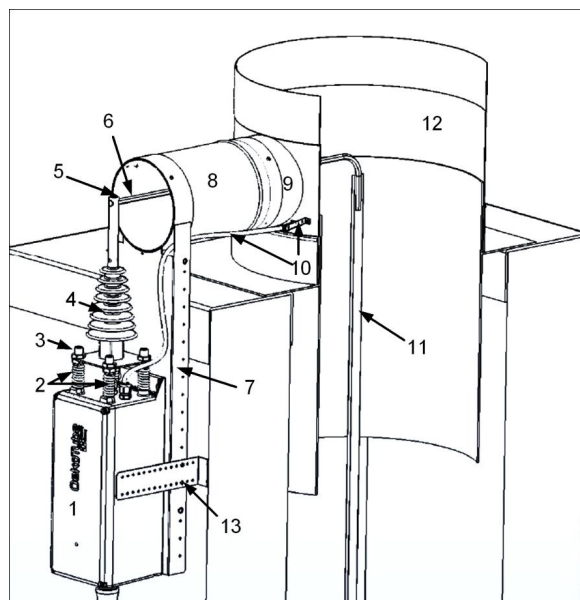
Appendix 1: Map of Reefton Airshed



Appendix 2: Diagram and photos of OekoTube

DIAGRAM OF THE OEKOTUBE ELECTROSTATIC PRECIPITATION FILTER

1. Electronic box
2. Springs
3. Adjusting nuts
4. Insulator
5. Grub screw to fix the hexagonal electrode
6. Holder (6)
7. Hexagonal electrode holder (steel rod)
8. Electronic box mounting bracket
9. Extension pipe
10. T-piece connecting piece
11. Temperature sensor and cable holder
12. Flexible electrode
13. T-piece
14. Mounting bracket



**The OekoTube ESP filter
bottom of circuit cover**



OekoTube circuit box on chimney



Light at



Appendix 3: Report on lab trial of OekoTube on a coal burner



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Testing of the OekoTube Electrostatic Precipitator on Coal Emissions

Customer: West Coast Regional Council
PO Box 66
Greymouth 7840

Report 14/2660

January 2014

**Customer: West Coast Regional Council
PO Box 66
GREYMOUTH 7840**

P1982/3

Attention: Lillie Sadler

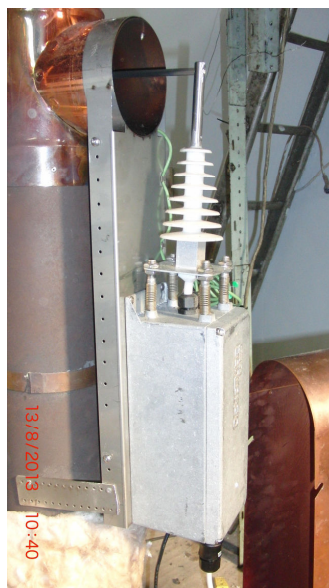
Testing of the OekoTube Electrostatic Precipitator on Coal Emissions

1.0 Introduction

Flue gas emissions of a sample of the appliance described below were tested using the procedures in Appendix 1. An OekoTube electrostatic precipitator (ESP) was installed in the flue and emissions were measured before and after the device. The ESP is designed to place a charge on particles in the flue gases which causes them to be attracted to the flue and deposited there as a coarse dust. The dust either falls into the fire or is removed when the flue is swept. Testing was carried out by George Looman and Pete Wilkie at our Beatty Street Laboratory in January 2014. Dr Rene Haeberli from EnviroSolve Ltd, Mr Jim Foster from The Reefton Airshed Committee, Mr Mike Meehan from West Coast Regional Council, Mr Terry Archer from West Coast Regional Council, and Mr Rob Whitney from the Coal Association were present for some or all of the testing.

Appliance	Freestanding Multifuel Heater	OekoTube
Manufacturer		OekoSolve
Type of Appliance		Electrostatic precipitator

Figure 1 OekoTube installed in flue (protective cover removed from device)



2.0 Experimental Details

2.1 Heater

The heater used for the test was a freestanding multifuel heater. The firebox dimensions were from side to side 470mm, door shut to rear firebrick was 430mm and the height from the grate in the firebox floor to the secondary air tube was 317mm.

2.2 Electrostatic Precipitator

During these tests the OekoTube unit was protected against heat off the flue by a sheet of Micore 160 placed between the flue and the control unit. As noted above the OekoTube is designed to be installed above the roof where the control unit will be separated from the flue by flue liners.

The ESP was installed by Dr Rene Haeberli. The ESP is designed to be installed above roof level. For testing, the ESP was installed in the flue above the calorimeter room. The ESP had an electrode that was inserted into the flue above the heater so that the top of the electrode was 4.08m above the floor of the calorimeter room. The electrode was approximately 1.6m long made up of two thin metal strips suspended in the flue with a weight on the bottom of the strips. The top of the strips was attached to a hexagonal bar that protruded from the flue and was clamped in an insulator above the electronics of the device.

A thermostat controls the OekoTube in normal use, but for this testing it was attached to a laptop computer and manually switched on and off. The laptop also functioned as a data logger for collecting information on the functioning of the OekoTube during the testing.

2.3 Fuel

Fuel was supplied by Mr Jim Foster from the Reefton Airshed Committee as follows

- Sub Bituminous coal from Giles Creek Mine, and RedDale Cosycoal
- Bituminous Coal – a mix of Strongman and Echo Coals
- Typical West Coast firewood (Beech) with moisture content approximately 33% ww.

Fires were started with kindling and small pieces of firewood before adding coal. Various coals and coal mixes were used at various times (see Appendix 1) during the testing:

- 100% Giles Creek coal
- Bituminous - 50% Strongman 50% Echo coals
- Blend 3 – 25% Strongman, 25% Echo, 50% Giles Creek coals
- 50% Reddale Coal and 50% West Coast firewood

2.4 Test Equipment

Tests were carried out using equipment specified in the joint Australian/New Zealand Standards 4012:1999 and 4013:1999. Portable Emission Samplers developed by Applied Research Services were installed in the flue above and below the ESP. The samplers cool and dilute the flue gases in the same way as the dilution tunnel used for testing to AS/NZS 4013 prior to collecting particulates on filters. The samplers are described in more detail in Appendix 3. The estimated uncertainty in emissions rates obtained with these samplers is 20%. The samplers were calibrated against the emissions rig.

2.5 Heater Operation

The heater was operated following the procedures set out in Appendix 1. This involved 5 phases on each day; a start up phase, 2 high burn phases, and 2 low burn phases. The test was run on 4 days and portable samplers (see section 2.6) were used to analyse the emissions before and after the

ESP. Two Samba brand fire starters were used to light the kindling. The fire starter was placed within the kindling stacked in a criss-cross pattern.

2.6 Fuel Analysis

Calculations using coal gross calorific value (GCV) and moisture content used figures from “The Analysis of New Zealand Industrial Coals” produced by the Coal Research Association of New Zealand. Wood GCV was based on analytical data from wood samples submitted to CRL Energy Ltd. Analysis and moisture content was determined by oven drying according to AS/NZS4014.2 Appendix A. For day 2 the moisture content used was the average for the Giles Creek coal and Wood at 29.9%.

3.0 Results and Discussion

3.1 Calibration of Portable Emissions Samplers

Figure 3a shows the correlation between the emissions rates obtained from the portable sampler above the OekoTube (Sampler 1) and the emissions rig dilution tunnel. Figure 3b shows the same data broken down by day and phase.

Figure 3a Correlation between the emissions rates obtained from the portable samplers and the emissions rig dilution tunnel.

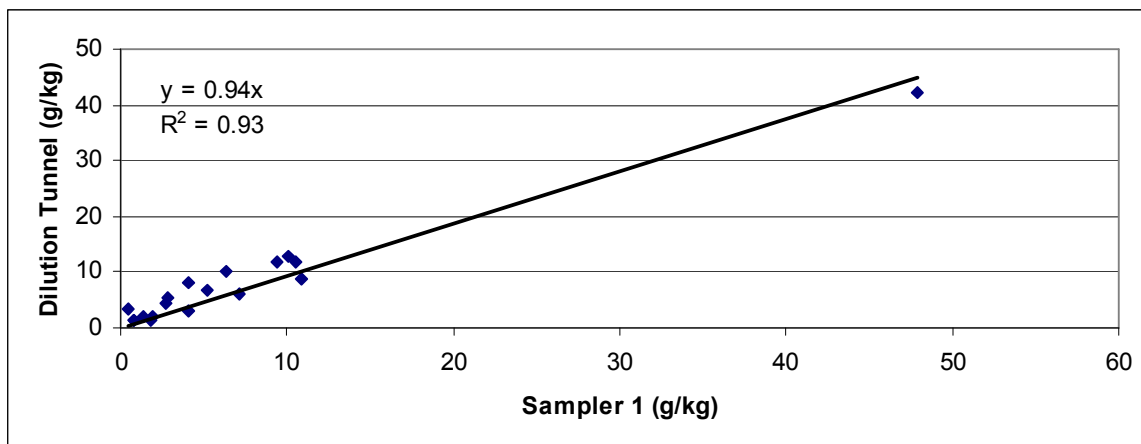
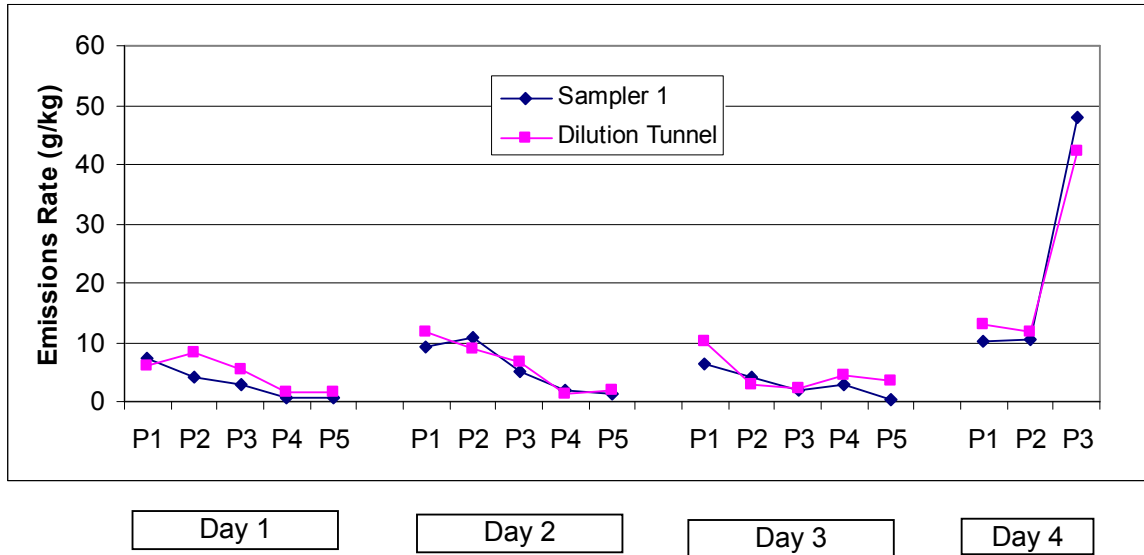


Figure 3b Emissions rates obtained from the portable samplers and the emissions rig dilution tunnel.

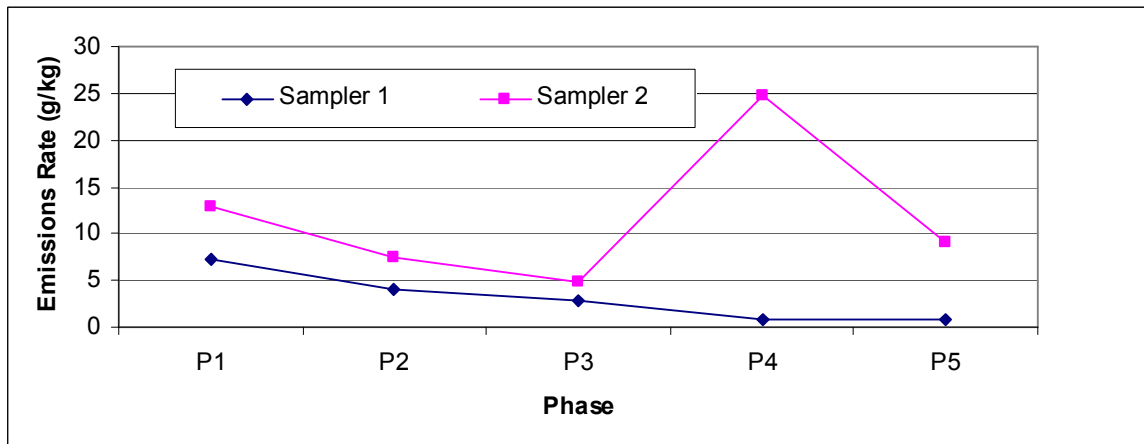


3.2 Particulate Emissions before and after the OekoTube

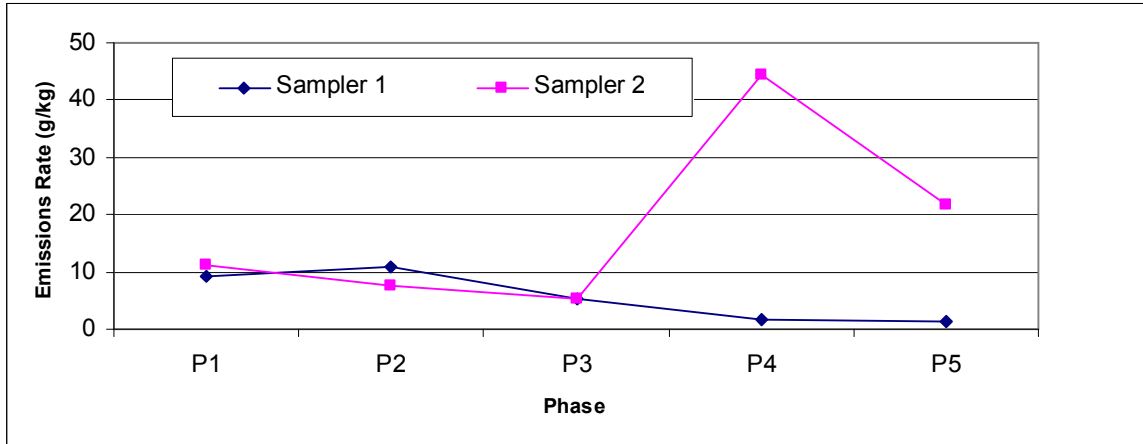
The portable emissions samplers were placed before (Sampler 2) and after (Sampler 1) the OekoTube ESP. Results are summarised in the graphs in figure 4.

Figure 4 Emissions Rates before (Sampler 2) and after (Sampler 1) the OekoTube ESP

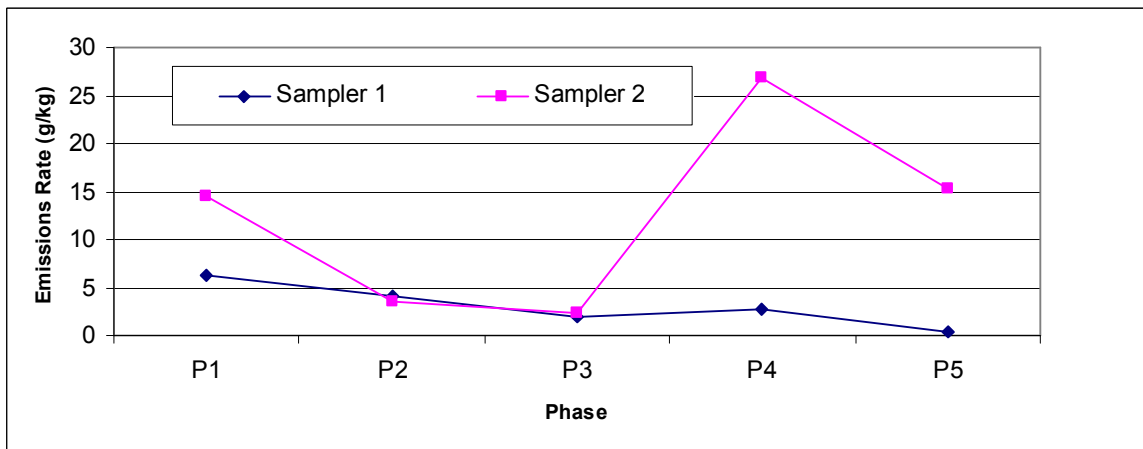
Day 1 (6/1/14)



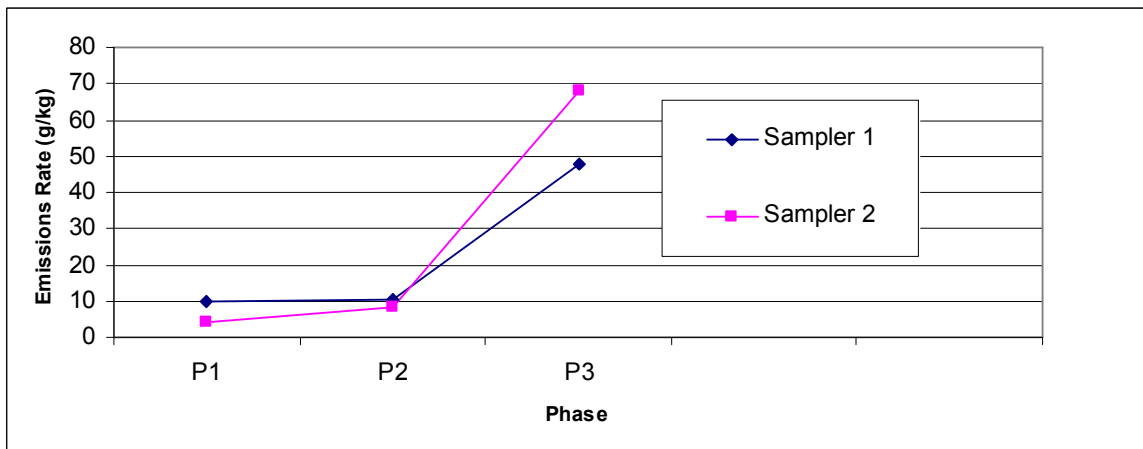
Day 2 (7/1/14)



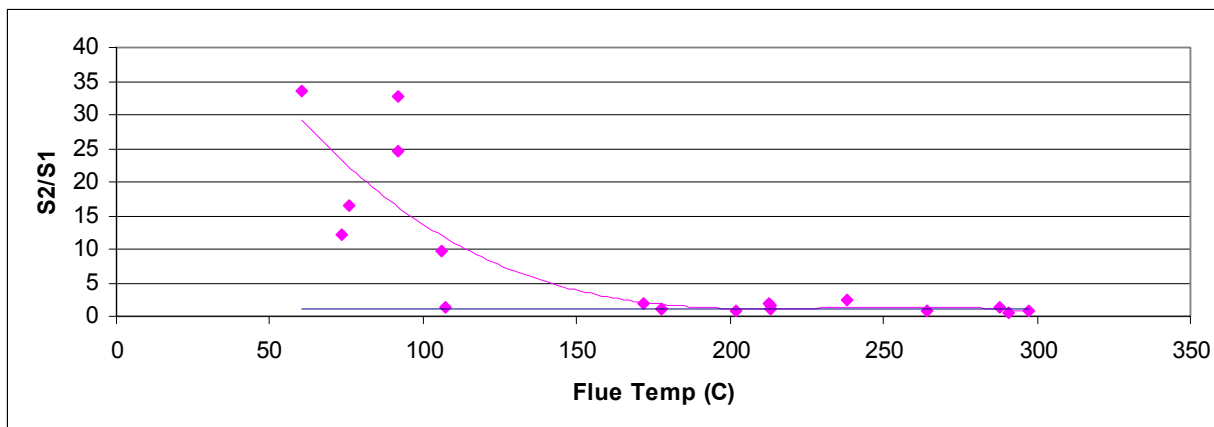
Day 3 (8/1/14)



Day 4 (9/1/14)



An electrostatic precipitator such as the OekoTube will collect materials which have condensed into particles. When flue temperatures are high a significant proportion of the emissions from the fire do not condense into particles until after the flue gases have left the flue. Figure 5 indicates that the efficiency of the Oekotube increases significantly as the flue temperature drops below 180 °C

Figure 5 Ratio of Emissions Rates as a function of flue temperature

3.3 Collection of Soot

The OekoTube is designed to precipitate particulates onto the flue wall. At the end of each test day the flue including the OekoTube and its electrode was swept and the sweepings were collected and weighed. A deposit of a tarry substance was also collected from the flue collar this was also weighed. The total weight of particulates emitted by the flue can be calculated from the dilution tunnel data and added to the weight of the sweepings and flue collar deposit, this gives an indication of the total mass of particulates emitted by the wood burner.

	Mass of Sweepings	Description of sweepings	Flue collar deposit	Description of collar deposit	Mass Emitted from Flue	Total Mass produced by burner	Proportion Retained in Flue
	(g)		(g)		(g)	(g)	%
Test Day 1	8	Powdery	6	Thick tarry gunge	48.9	62.9	22
Test Day 2	16	Gritty	3	Granular tarry gunge	78.4	97.4	20
Test Day 3	62	Coarse flake	1	Granular tarry gunge	59.5	122.5	51
Test Day 4	28	Soft powder	0	none	95.0	123.0	23

These results indicate that the ESP is removing on average 29 % of the particulate emissions.

3.4 Filters

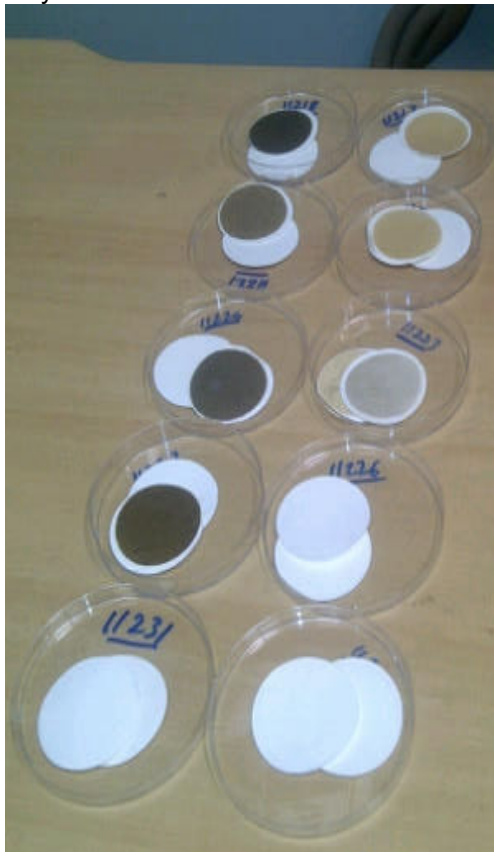
Coal combustion generates soot particles and volatile organic compounds (VOCs) some of which condense into droplets when cooled. An ESP will collect substances which have condensed into particles by the time they pass through the ESP. The dilution tunnel is designed to cool the flue gases in a similar way to what happens when they are released into the atmosphere. The filters that collect particulates from the dilution tunnel typically catch soot particles on their front surface while the condensed VOCs form a yellow oily deposit that penetrates through the filter.

The filters took several weeks to reach a stable weight as required by clause 6.9 of AS/NZS4013.

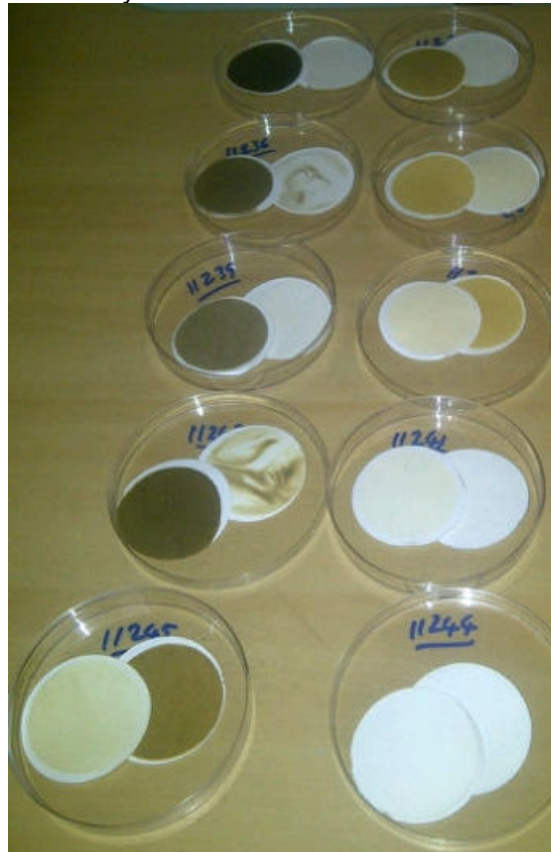
The photographs in Figure 5 show the front face of the filters. These suggest that the ESP is removing the bulk of the soot but is much less effective in removing VOCs from the flue gases.

Figure 5 Filter deposits - Sampler 2 on Left (before ESP) Sampler 1 on Right (after ESP), first phase at top last phase at bottom of photographs

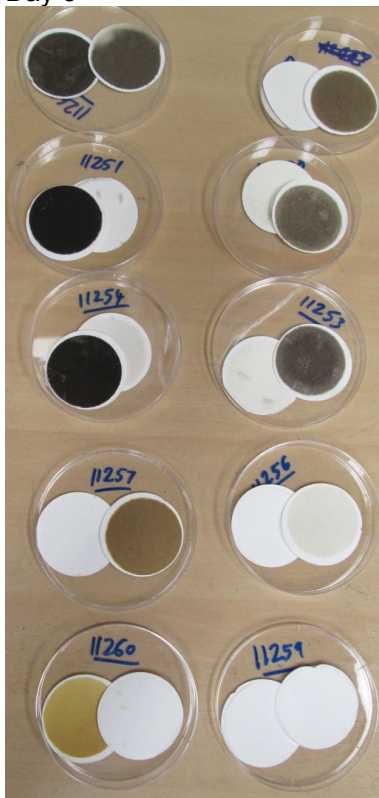
Day 1



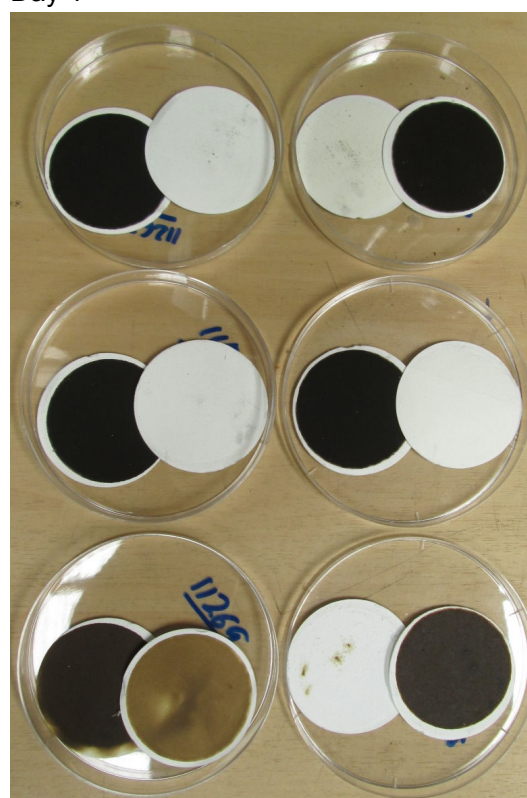
Day 2



Day 3






Day 4



4.0 Summary

These results indicate that the effectiveness of the OekoTube increases markedly as the flue temperature drops. At higher flue temperatures it appears that the OekoTube removes soot while allowing uncondensed material to pass through.

This Report:

Report: 14/2660	
Prepared by: G. Looman	
Approved by: W.S. Webley	
Release Date:	

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Appendix 1 Procedure

Day 1: Five phases - each one hour long - operation with Giles Creek Coal.

Ph1 - start up and operation at high

Heater set on high

Start up on kindling using approximately 1.5kg of kindling each piece weighing approximately 75g. Use 2 firelighters. When well alight add 3 pieces of wood at 300g each.

When well alight add 3 kg coal

Ph2 - high burn

Add approximately 3kg coal

Ph3 - high burn

Add approximately 3 kg coal

Ph4 - low burn

Add approximately 3kg coal

Ph5 - low burn

Add sufficient coal to bring back to start weight of Phase 3

Day 2: Five phases - each one hour long - operation with wood and Giles Creek Coal (50:50 mix approximately).

Heater set on high

Start up on kindling using approximately 1.5kg of kindling each piece weighing approximately 75g. Use 2 firelighters. When well alight add 3 pieces of wood at 300g each.

When well alight add 3 kg coal and wood mix (50/50)

Ph2 - high burn

Add approximately 3 kg coal and wood mix (50/50)

Ph3 - high burn

Add approximately 3 kg coal and wood mix (50/50)

Ph4 - low burn

Add approximately 3 kg coal and wood mix (50/50)

Ph5 - low burn

Add sufficient coal and wood mix (50/50) to bring back to start weight of Phase 3

Day 3: Five phases - each one hour long

Re fuel loading as and when required based on usual operation within a home.

This shouldn't be seen as totally prescriptive, however. For example if the fire is not responding to a fuel load when under low burn then increase the temperature setting until the fire is burning properly and then reduce to low burn (i.e., undertake whatever reasonable measures are required to make sure the burn cycle does not deviate too much from what would be reasonably done in a home).

Just operate the burner as it might be used in a home type setting.
Phase 1 still includes a cold start. Operation with Reddale Cosycoal and wood.

Phase 2 - operation as normal - but make a note of the percentage of time at different settings. Operation with Reddale Cosycoal.

Phase 3 - operation as normal - but make a note of the percentage of time at different settings. Operation with Reddale Cosycoal and wood.

Phase 4 - operation as normal - but make a note of the percentage of time at different settings. Operation with Reddale Cosycoal.

Phase 5 - operation as normal - but make a note of the percentage of time at different settings Operation with Reddale Cosycoal and wood.

Day 4: same as Day 1 but using bituminous coal. Only one low burn i.e. 4 phases.

Phase 1 Bituminous Coal and wood at start up

Phase 2 Bituminous Coal

Phase 3 Blend 3

Phase 4 Blend 3

Filter changes at end of each phase

Appendix 2 OekoTube Manufacturer's brochure

OekoSolve
Environment. Energy.



OekoTube – the micro-dust filter for your wood fire.

The OekoTube is an electrostatic filter which substantially reduces your micro-dust soot emissions from small wood-fired stoves like open fireplaces, free standing wood stoves and pellet stoves.

The micro-dust filter OekoTube is suitable for all wood fires with a capacity below 40 kW and is mounted on top of the chimney. According to laboratory tests for wood fired heating facilities, the OekoTube has an officially tested efficiency of 95 % and therefore meets all the requirements of the Official Swiss Air Pollution Control Ordinance (CAO/LRV).

The OekoTube micro-dust filter can easily be fitted to both new and existing wood-heating and burning systems. No structural changes are necessary inside an existing building, because the micro-dust filter is mounted outside, on top of the chimney.

OekoTube facts

- Suitable for all small wood fire facilities like open fireplaces, free standing wood stoves, central heating systems fuelled with wood logs, shavings or wood chips below the capacity of 40 kW
- Proven and officially tested efficiency of 95% of particulate matter
- Massively increased air quality
- Can easily be fitted on any kind of chimneys (steel or brick)
- Automatically functions and regulates
- No alterations on existing chimneys
- Easy cleaning by the chimney sweeper
- Robust, sturdy and built to last long
- Available in New Zealand through the official agency EnviroSolve Ltd for New Zealand and Australia – Dr. Rene Haeberli

Requirements for the installation of the OekoTube micro-dust filter

- A minimum of two metres vertically downward length from the top of the chimney
- Availability of a direct power supply (230V AC)



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Wood as an energy source and micro-dust. Wood is a traditional energy and heating source in New Zealand. It is efficient, renewable and wood fuels do not incur any carbon charge. The use of wood as an energy source for heating purpose is CO₂ neutral and promotes the added value chain within the regional economy. The New Zealand Government has confirmed its on-going commitment to encouraging the use of this renewable energy. Unfortunately, burning wood is releasing hazardous micro-scoping dust into the atmosphere.

For several years the micro-dust emissions created by wood fires has been a daily topic of conversation, especially during winter months. During inverted atmospheric conditions [a stable warm layer of air above a cold ground layer], the legal limits of fine particulate matter in the air are regularly and massively exceeded. Scientific studies show that these micro-particles [especially smaller than 1 micron in diameter] are a serious health hazard. These micro-particles are passing through your respiratory track into the alveoli of the lungs and then enter the bloodstream. Therefore not only the lungs but also other organs can be affected by these micro-particles. Coughing, bronchitis, asthma, cardio-vascular diseases and sometimes even lung cancer could be severe health consequences.

Installing an OekoTube on chimneys is an active and effective contribution to local and global air quality. The micro filter is ecologically and economically beneficial because older heating systems can be used longer and are more environmentally friendly.

Installation und operation. The OekoTube is fitted between the cover and the top of the chimney. The height of the chimney will be increased by 25 cm due to the installation of the so-called divider. The flue draft will not be affected by this alteration. In order to install the electrode there has to be a minimum vertically downward length from the top of the chimney of two metres. There is also a direct power supply of 230 VAC needed nearby to operate the electrode.

When the fire is lit, the DekoTube automatically turns on and it switches to a standby mode after the fire has gone out. Less than 30 W of electrical power is needed for the operation of the OekoTube. During the operation the micro-dust particles are collected

Operation principle

The OekoTube filter functions on the electrostatic principle. The operational principle of the OekoTube is schematically illustrated in the following pictures.

- 01 The micro-dust particles are flowing with the used air through the air channel of the OekoTube filter
- 02 The high voltage electrode is releasing electrons into the chimney space containing the micro-dust particles.
- 03 Due to the electrostatic force the electrons move towards the chimney wall. During this process the micro-dust will get electrostatic polarized and are also moving towards the chimney wall.
- 04 The micro-dust particles are collected on the inside wall of the chimney and clog together into coarse flakes. This particulate matter will be removed by the chimney sweeper at the annual chimney inspection.

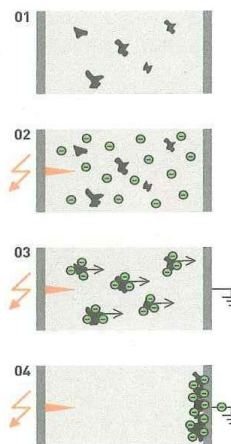
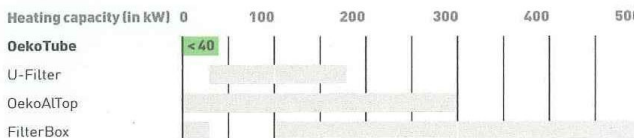


Diagram of all OekoSolve micro-dust filters on offer



on the inside wall of the chimney and clog together into coarse flakes, which are not hazardous or dangerous to the environment.

Easy cleaning. The OekoTube filter will be easily cleaned by a professional chimney sweeper at your annual chimney inspection. The coarse flakes of fine particulate matter will be removed with a common chimney broom. The chimney sweeper can clean the chimney from the top or from underneath, without removing the electrode of the OekoTube.

Agencies and sales. The OekoTube is available from the official agency EnviroSolve Ltd for New Zealand and Australia – Dr Rene Haeberti. Please check out our website www.envirosolve.co.nz for more info.

Your micro-dust soot emission



01.02.2012

Appendix 3 Information on the Portable Emissions Sampler

Technical Bulletin 72

Portable Emissions Sampler

The portable emissions sampler captures particulate emissions using a method based on Oregon Method 41 (OM41). This method is also known as the Condar Method.

Principle of Operation

The sampling head includes a dilution system to dilute and cool the flue gas. This simulates the dilution and cooling that occurs when flue gases mix with ambient air and results in condensation of oily compounds such as polyaromatic hydrocarbons which can then be captured on the filter.

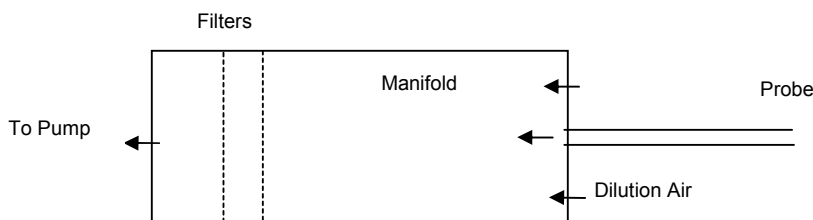
In practice, flue gases are drawn into a manifold through the sample probe. Dilution air is also drawn into the manifold through small holes in its face. The diluted gases are then drawn through two filters which collect the particulate emissions.

Details of the Sampler**General**

The sampler includes a sampling head (detailed below) which captures the sample of particulates. In addition flue temperature is measured, flue gases are analysed continuously for oxygen and carbon dioxide content and the carbon dioxide content of the diluted gas stream is analysed. The sampler also contains gauges to monitor and set gas flows through the sample head and flue gas analysers, canisters of drying agent to remove water vapour from the gas streams, a gas meter to quantify the sample flow and a vacuum sensor to monitor filter loadings. The sampler is interfaced to a laptop computer which activates the sampling pump when the heater is operated and the flue temperature rises. The computer is also used to log data.

Sampling Head

The sampling head consists of a stainless steel dilution manifold (length 100 mm, internal dia 49 mm) fitted with two end caps. One end cap is fitted with a short probe with a glass insert. The probe is inserted into the flue so that the inlet is near the flue center. Dilution air is admitted to the manifold via 12 x 1 mm dia holes in the face of the end cap. The sample is collected on two 47 mm glass fibre filters (Gelman Type A/E Cat No 61631) mounted on two filter holders fitted to the other end cap of the manifold.

Figure 1. Schematic Of Sampling Head

Apart from the probe and manifold assembly the sampling assembly is the same as used in AS/NZS 4012/3. As with NZS4013 two glass fibre filters are used to collect the particulate materials. The flue gas composition is also measured and is used to calculate the total volume of gas which has passed up the flue per kg of fuel burnt. The total emissions can then be calculated from rate at which material is collected on the filter and the dilution ratio.

Comparison of Results Obtained with AS/NZS 4012/3

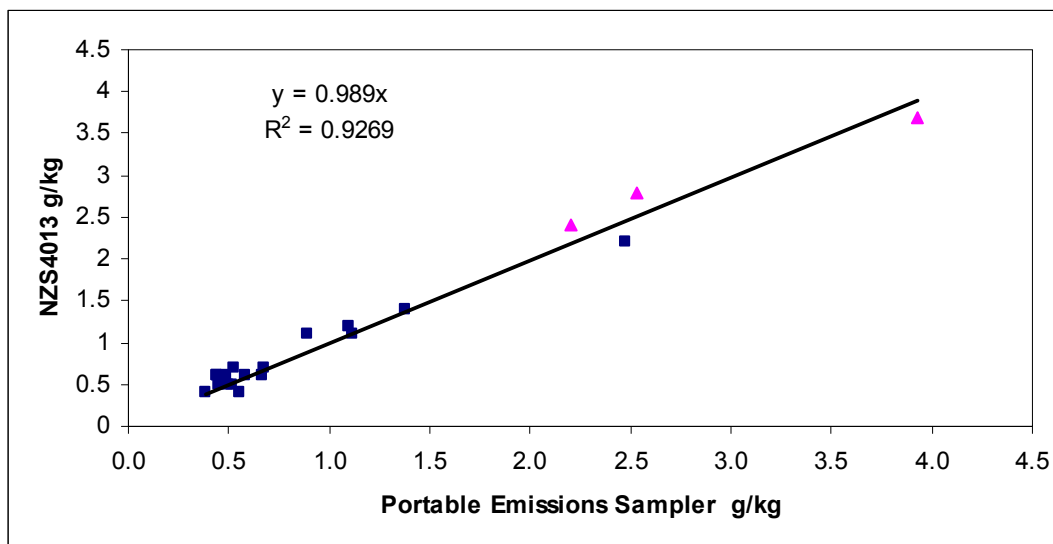
Laboratory tests of wood burners for compliance to particulate emissions standards in New Zealand are currently tests carried out according to methods set out in the joint Australian/ New Zealand standard AS/NZS 4012/3. The test involves capture of the entire gas stream exiting the flue which is then passed to a dilution tunnel where it is mixed with room air which provides dilution and cooling. The particulate sample is drawn from the end of the dilution tunnel. Because the velocity of gas in the dilution tunnel is more easily measured than that in the flue the amount of particulate generated is relatively easily calculated.

During the comparative tests the portable emissions sampler was set up in the test room and run at the same time as the laboratory test rig.

Results

The graph below shows the results of nineteen runs carried out on a range of heaters. Of these seventeen (squares) were obtained during tests where fuelling was carried out in accordance with the requirements of AS/NZS 4012/3 and three (triangles) were carried out during five hour runs and a “real life” fuelling regime in accordance with SMF Contract Application Number 2205. Results are particulate emissions in g/kg.

Figure 2 Comparison of Results Obtained with Portable Emissions Sampler and AS/NZS 4012/3



The results show that a good correlation exists between results obtained with the two methods.

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Appendix 4 Test Data

		Emissions Rate (g/kg)				Flue Temp (°C)		
		Sampler 1	Sampler 2	Ratio S2/S1	Dilution Tunnel	Sampler 1	Sampler 2	Tav
Day 1	P1	7.15	12.84	1.80	6.08	142.30	200.80	172
	P2	4.12	7.35	1.78	8.12	133.80	291.00	212
	P3	2.86	4.85	1.70	5.50	141.50	285.00	213
	P4	0.76	24.76	32.69	1.47	57.00	127.00	92
	P5	0.75	9.09	12.18	1.49	47.00	99.80	73
Day 2	P1	9.34	11.12	1.19	11.83	125.40	229.60	178
	P2	10.83	7.71	0.71	8.81	140.60	263.10	202
	P3	5.22	5.23	1.00	6.72	145.80	280.50	213
	P4	1.81	44.53	24.62	1.24	50.90	132.80	92
	P5	1.31	21.58	16.46	1.89	43.00	109.10	76
Day 3	P1	6.32	14.59	2.31	10.25	170.70	305.90	238
	P2	4.10	3.54	0.86	2.94	181.60	412.70	297
	P3	1.95	2.42	1.24	2.12	174.80	401.00	288
	P4	2.76	26.95	9.76	4.44	58.60	154.00	106
	P5	0.45	15.21	33.63	3.43	39.80	81.00	60
Day 4	P1	10.08	4.36	0.43	12.90	202.00	379.00	291
	P2	10.52	8.32	0.79	11.81	175.00	353.00	264
	P3	47.86	68.22	1.43	42.12	64.50	150.00	107

Fuel loads

Note: Start up phase uses wood for kindling and Intermediate 1 loads each day

Sampling time is the time the sampling was taking place, the burn times for each phase were 2-3 minutes longer

Average burn rate is on a dry weight basis

Day 1 - Coal only

	6/01/2014 Giles Creek Coal	Bed weight at loading kg	Fuel Load kg	Moisture Content	Flue Temp at loading °C	Ave Flue Temp °C	Fuel burnt kg Fuel load + ember bed weight difference	Sampling Time min	Ave burn rate kg/h	Fuel dry weight kg
				%ww						
P1	Start-up Phase kindling	0.00	1.472	14	20	206	3.741	60	3.74	2.86
	Intermediate 1	0.95	0.919	31	331					
	Intermediate 2	0.93	3.040	28.7	230					
P2	High Burn Rate	1.69	3.066	28.7	281	295	3.056	60	3.06	2.18
P3	High Burn Rate	1.70	3.022	28.7	292	326	2.832	60	2.83	2.02
P4	Low Burn Rate	1.89	3.002	28.7	289	140	1.432	62	1.39	1.02
P5	Low Burn Rate	3.46	1.422	28.7	124	109	1.132	60	1.13	0.81
	End	3.75								
		Total fuel added	15.943				12.193	302	2.42	8.89

Day 2 - Coal and wood mix

	7/01/2014 Giles Creek Coal and Beech (50/50)	Bed weight at loading kg	Fuel Load kg	Moisture Content	Flue Temp at loading °C	Ave Flue Temp °C	Fuel burnt kg Fuel load + ember bed weight difference	Sampling Time min	Ave burn rate kg/h	Fuel dry weight kg
				%ww						
P1	Start-up Phase kindling	0.00	1.462	14	25	258	4.276	60	4.28	3.22
	Int 1	0.89	0.963	31	406					
	Int2	1.15	3.121	29.9	351					
P2	High Burn Rate	1.27	3.340	29.9	269	300	3.27	60	3.27	2.29
P3	High Burn Rate	1.34	3.094	29.9	289	306	3.034	60	3.03	2.13
P4	Low Burn Rate	1.40	3.047	29.9	292	147	1.767	60	1.77	1.24
P5	Low Burn Rate	2.68	3.079	29.9	134	118	1.809	60	1.81	1.27
	End	3.95								
		Total fuel added	18.106				14.156	300	2.83	10.15

Day 3 - first high burn coal, second high burn coal and wood, first low burn Coal, second low burn coal and wood

	8/01/2014	Bed weight kg	Fuel Load kg		Moisture Content		Flue Temp at loading °C	Ave Flue Temp °C	Fuel burnt kg Fuel load + ember bed weight difference	Sampling Time min	Ave burn rate kg/h	Fuel dry weight kg
			Wood	Coal	%ww wood	%ww coal						
P1	Start-up Phase kindling	0.00	1.453		14		20	307	4.961	60	4.96	3.99
	Intermediate 1	0.38	0.975		31		341					
	Intermediate 2	0.76		3.076		18.4	252					
	Intermediate 3	3.16		2.957		18.4	206					
P2	High Burn Rate	3.50		2.995		18.4	386	421	3.995	60	4.00	3.26
		5.40		3.030		18.4						
P3	High Burn Rate	5.53	1.474	1.597	31	18.4	534	408	3.201	60	3.20	2.41
P4	Low Burn Rate	5.40		3.006		18.4	390	163	0.856	60	0.86	0.70
P5	Low Burn Rate	7.55	0.53	0.500	31	18.4	108	88	0.31	60	0.31	0.23
	End	8.27										
		Total fuel added	21.593						13.323	300	2.66	10.59

Day 4 – Bituminous coal for start up and first high burn, blend 3 for second high burn and low burn

	9/01/2014	Bed weight kg	Fuel Load kg		Moisture Content	Flue Temp at loading °C	Ave Flue Temp °C	Fuel burnt kg Fuel load + ember bed weight difference	Sampling Time min	Ave burn rate kg/h	Fuel dry weight kg
			Wood	Coal	%ww						
P1	Start-up Phase kindling	0.00	1.201		14	20		0.272	60	0.27	2.71
	Intermediate 1	1.08	0.991		31	348					
	Intermediate 2	0.86		2.998	7.5	219					
P2	High Burn Rate	1.92		3.004	7.5	339	393	2.254	52	2.60	2.08
P3	High Burn Rate	2.67		3.000	18.1	291	353	2.76	60	2.76	2.26
P4	Low Burn Rate	2.91		3.000	18.1	299	154	1.200	60	1.20	0.98
	End	4.71									
		Total fuel added	14.194					6.486	232	1.68	8.04

Appendix 4: Report on Evaluation of effectiveness of OekoTube in reducing Reefton PM¹⁰ emissions

**Appendix 5: Report on Monitoring the Operation of an Electrostatic Precipitator
Filter on Reefton Chimneys**



**MONITORING THE OPERATION
OF AN
ELECTROSTATIC PRECIPITATOR
FILTER ON
REEFTON CHIMNEYS**

October 2014

Introduction

This report outlines the results of a trial monitoring the operation of an electrostatic precipitator (ESP) filter on two domestic burners in the Reefton Airshed. The particular ESP filter used is called the OekoTube which is designed to make PM₁₀ particles adhere to chimney walls, thus reducing the amount of PM₁₀ emissions discharged out the flue.

Background

Since October 2012 the Reefton Airshed Committee (RAC or the Committee) has been investigating options for reducing PM₁₀ emissions from domestic burners in the Reefton Airshed, to improve air quality and meet the National Environmental Standard for Air Quality (NESAQ).

The NES requires that PM₁₀ levels be no higher than 50 µg/m³ averaged over a 24-hour period, with three permissible exceedances per year after September 2016, and only one per year after September 2020. Council's air quality monitoring in the Reefton Airshed shows multiple exceedances of the standard every year since 2006.

While the OekoTube appears to be a possible solution to reducing PM₁₀ emissions in the Reefton Airshed, there is no information on its performance on domestic coal fires. A laboratory trial was therefore undertaken in January 2014 to determine the percentage reduction of PM₁₀ by the OekoTube on a coal, and coal and wood (50:50), fire. The results indicated a 90-97% reduction when the fire was operated at low burn setting, and approximately 58% reduction in total emissions across all the trialed burn cycles,⁶ although the actual reduction could be higher in the colder Reefton air temperatures. The lab trial results give a positive indication that the ESP filter on domestic burners may be sufficient to achieve the NES for PM₁₀ in Reefton, in tandem with other methods.

There is likewise no information on maintenance requirements of the ESP filter operating on a coal fire, specifically how quickly soot dust builds up on the flue wall and how often a chimney may need cleaning. The purpose of this trial is to identify how well the OekoTube runs mechanically in live conditions.

The trial

ESP filter

Two ESP filters were installed on a coal, and wood and coal, fire in the Reefton Airshed on 12th May 2014. The filters used are known as OekoTubes, consisting of a 1.5 metre long steel rod placed in the top inside of the chimney. A small electrical current is sent through the rod which causes PM₁₀ and smaller particles to cluster together into larger particles and attach to the side of the chimney rather than discharging into the air. Further details about the OekoTube are shown in Appendix 1. While there may well be other ESP devices being developed overseas, the OekoTube is the only one Council is aware of that is currently accessible in New Zealand.

⁶ Wilton, E. February 2014. Evaluation of the effectiveness of the OekoTube ESP in the management of PM₁₀ in Reefton.

The OekoTube ESP filter**OekoTube circuit box on chimney****Light at bottom of circuit cover**

Domestic burners

The flues on the two burners used in the trial were swept prior to the OekoTube being installed and operated, so there was no build-up of soot dust on the flue wall at the start of the trial.

The homeowners proceeded to operate their burners as they usually do during the colder Winter months (both burners are 25kW). The household burning coal and wood used Reddale coal, and to further replicate burning typically carried out in Reefton homes they burnt moderately wet, native wood.⁷ The household burning only coal used Giles Creek coal. Bituminous coals were not used as the laboratory trial identified that bituminous coal soot, being very fine and powdery, clogs up the ESP filter so it stops functioning.

Both burners were operated 24 hours a day, seven days a week, and were only stopped for approximately 10-12 hours before each monitoring round to enable the flue to cool down enough for the contractor to view and measure the soot dust in the flue.

Monitoring

Levels of soot dust on both chimneys were measured four times during the Winter months, on 30 May, 27 June, 28 July, and 3 September. Daryl Topp of Topp Services Ltd in Greymouth was contracted to the West Coast Regional Council to do the monitoring, which involved climbing up on each roof, measuring the thickness of the soot dust layer at various places on the ESP filter and in the flue, recording measurements, and taking photos. Appendix 2 is a copy of the recording sheet.

Results of the trial

Note: No photos were available from the first round of monitoring due to a technical problem with the camera.

Table 1: Dust on insulator

The colour of the dust on the insulator of the OekoTube was ranked from "1" being all white to "10" being dark black. Dust thickness on the insulator was measured to give an indication of particulate matter coming out the chimney, which flows through the extension of the chimney and circulates under the circuit cover of the ESP filter.

⁷ The moisture content of wood burnt in the Airshed is often more than 25% as the wood is not stored long enough to sufficiently dry out. Most wood is sourced from the local area and is native, which takes longer to dry out than exotic timber such as pine or eucalyptus.

Date	Mace Street (coal)		Colour	Plaskett Street (coal and wood)	
	Color	Thickness		Thickness	
30 May	8	Under 1/10mm	4	Under 1/10mm (very little dust)	
27 June	6	Under 1/10mm	7	Under 1/10mm	
28 July	8	1mm	Not recorded	1mm	
3 September	9	1mm	8	1mm	

After nearly four months of burner operation layers of soot dust accumulating on the OekoTube's white insulator has obviously changed the appearance of the insulator to dark grey and black.

There is little difference between the colour and thickness of dust on both insulators, although the texture varied. Dust on the insulator of the coal fire tended to be dull, fine and powdery, compared to the dust from the coal-wood fire which had a shiny, varnished appearance due to the resin from the wood.



Insulator on coal fire, second monitoring round, 27 June



Insulator on coal-wood fire, monitoring round, 27 June



Insulator on coal fire, third monitoring round, 28 July. Note damage on top



Insulator on coal-wood fire, third monitoring round, 28 July

ring, discussed under 'Cleaning the firebox' on Page 8

Table 2: Dust on electrode and flue wall

Dust thickness on the top of the electrode, and upper and lower flue wall were measured. The lower flue wall at the base of the electrode could not be physically measured so it was visually estimated relative to being a $\frac{1}{4}$, $\frac{1}{3}$, or $\frac{1}{2}$ of the distance between the flue wall and the electrode, which is a maximum distance of 75mm (see Question 6 of the record sheet in Appendix 1). These results are translated into millimetres.

Date	Mace Street (coal)			Plaskett Street (coal and wood)		
	Horizontal part of electrode	Flue wall near top of electrode	Flue wall at bottom of electrode	Horizontal part of electrode	Flue wall near top of electrode	Flue wall at bottom of electrode
30 May	Under 0.5mm	4mm	Under 19mm	Under 0.5mm	3-6mm	Under 19mm
27 June	0.1mm	1-4mm	Not recorded	Under 0.5mm	4-10mm	Under 19mm (approx. 4-5mm)
28 July	1mm	1mm	Not recorded	1-2mm	5-12mm	About 19mm
3 September	0.5mm	0.5mm	At least 37mm spikes	1.5mm	5-8mm	5-8mm

The results show a minor buildup of soot dust in both chimneys, to different extents for the coal, and wood-coal, fires.

Electrode

There is very little buildup of dust on the electrode from both fires, indicating that the OekoTube is working properly with the electrical current making particles attach to the flue wall rather than to the electrode, except for a typically very small amount attracted to the electrode due to it being in the gas stream and having a positive charge. This is a positive outcome as too much dust on the electrode will make it stop functioning. As expected, spikes on the lower flue wall have broken off before they became long enough to touch the electrode and cause a shortage.

Flue dust from coal fire

The contractor noted that with the coal fire there was only a small buildup of very fine, powdery soot dust on the flue wall, and this tended to be evenly spread throughout the flue for most of the trial period. By the fourth monitoring round further buildup had occurred on the flue wall at the bottom of the electrode, while the thickness at the flue top and on the electrode had slightly reduced. The latter may be due to reentrainment which is discussed later in this report.

The lesser buildup compared to the wood-coal fire can be attributed to the Giles Creek coal dust being very light, dispersing more readily, and not having wood resin to bind more of it to the flue wall.

The soot colour also changed from black at the earlier monitoring rounds to light grey at the fourth monitoring round. The latter colour indicates that the particles clustered on the flue wall are well burnt from a hot fire.



Black coal soot 1-4mm thick on upper flue wall, wall, 0.1mm on electrode, 27 June



Coal dust 0.5mm thick on upper flue wall, 3 September



Lower flue wall, soot less than 19mm thick, 27 June



Lower flue wall, soot evenly spread, grey colour, 28 July

Flue dust from wood-coal fire

As mentioned above, the thicker soot dust on the upper flue wall of the coal-wood fire compared to the coal fire is due to the wood resin from burning wet wood. The higher the moisture content in the wood, the more tar is present in the particles, and the more particles adhere to surfaces. In the early stages of the trial the dust was flaky in appearance, with a black shine underneath from the wood. At the end of the trial drier wood was used, and so the soot changed to a powdery consistency.

The contractor noted at the second monitoring round a lot of soot flakes on the roof. The drop in soot thickness by the fourth monitoring round may be due to reentrainment.

As with the coal fire, after four months of burning the dust changed from a dark grey/black colour to light grey with white edges, indicating that the soot was well incinerated by a hot fire.



Black wood-coal soot, 4-10mm thick on upper flue wall, under 0.5mm on electrode, 27 June



Light grey dust, 5-8mm thick on upper flue wall, 3 September



Wood-coal soot, less than ¼ the distance between the lower flue wall and the bottom of the electrode, grey/black colour, 27 June



Light grey dust, approx. 5-8mm evenly spread on lower flue wall, 3 September

Reentrainment

Reentrainment is where soot dust particles cluster together into flakes or spikes on the flue wall, and when large enough break off and either drop down into the firebox to be re-burnt, or are discharged out the chimney when the burner vents are fully opened. Flakes generally land on the roof around the chimney base or on the ground, depending on weather conditions. Reentrainment discharged out the chimney is significantly larger than the PM₁₀ size, much less likely to enter human airways, and is easily washed away by rain.

It was observed in this trial that a smaller amount of reentrainment from the coal fire settled on the roof, compared to reentrainment from the wood-coal fire. Notwithstanding weather conditions and volume of fuel burnt, this may be due to wood resin making the wood-coal particulate heavier and stickier.



Reentrainment particles at the chimney base of the coal fire



Particles on the roof from the wood-coal fire



Wood-coal reentrainment on a plastic chair

The phenomenon of reentrainment makes it difficult to obtain precise measurements of the amount of soot dust buildup on the flue wall, however it is not the purpose of this trial to measure the total amount of dust retained.

Findings

The ESP filter has clearly retained soot dust containing PM_{10} within the flue almost continually over Winter without any major malfunctions, confirming that it does operate well in real life conditions on coal and coal-wood fires. The minor buildup of soot dust on the flue wall did not interfere with the safe operation of the burners.

Maintenance findings

On-site testing has proved to be very valuable in identifying some minor maintenance and operational matters that will improve use of the ESP device.

Chimney cleaning

The small amount of soot buildup on the flue wall indicates that with the ESP filter operating full time over the four-month Winter period, cleaning the flue and electrode once a year should be sufficient to ensure the flue functions safely and efficiently. The buildup of soot dust over the trial period was not enough to require the chimneys to be cleaned during the trial period. The reentrainment process created by the ESP device is self-cleaning to a large extent, and fully opening the vents helps to remove spikes and flakes.

Minor modification to flue

A minor modification may need to be made to the flue cap to avoid smoke potentially shorting out the insulator. The chimney cap fitted on most chimneys to stop rain infiltration partially restricts the flow of smoke out the chimney, resulting in some smoke flowing through the ESP circuit box. Too much smoke entering the circuit box can lead to a heavier buildup of dust on the insulator which in turn causes the device to short out. The problem can be alleviated by extending the height of the cap legs to give greater clearance. If smoke still flows through the circuit box under heavy discharge, a second option is to make a 50mm diameter hole in the flue cap allowing more smoke and tar to escape directly out the flue, and reducing the amount going through the circuit box. A 50mm hole will not allow volumes of rain in which will extinguish the fire. As there will still be some smoke that flows through the circuit box the insulator and circuit unit needs to be checked and cleaned once a year.

Routine checks

It is helpful if occupants regularly check that the ESP filter is operating properly. This can be done by checking what colour the light is at the bottom of the circuit cover (on the outside of the filter device at the top of the chimney):

Red:	means there is a problem with the OekoTube. A common problem is an electrical shortage. If soot builds up on the flue wall at the bottom of the electrode and gets too close to the electrode, or builds up on the insulator, or the electrode is off-centre, this can make the OekoTube cut out. It could also be caused by a faulty security magnet built into the OekoTube cover for safety reasons, which can easily be replaced.
Green flashing:	means the fire is not on and the OekoTube is on standby. There is 10 seconds between each flash so allow enough time to ensure the green light is flashing. During warmer months when fires are not used, the OekoTube can be switched off.
Green	means the OekoTube is working and the fire is going.
No light	means the OekoTube is switched off.

Cleaning the firebox

Clearing ash from the grate too quickly or vigorously can damage the insulator, causing the ESP filter to stop working. A cloud of ash going up the flue will settle on the insulator, and can short out the unit. The photo on the right shows damage to the top ring of the insulator where the electricity current has arked across the ash buildup, cracking the ring and causing chips to come away around the edge. Shorting out will stop the OekoTube working for around 10-15 minutes until the ash cloud has cleared. This should be avoided as it means that additional PM₁₀ is discharged out the chimney while the OekoTube is not working. The grate needs to be cleaned slowly and gently to avoid stirring up too much ash.

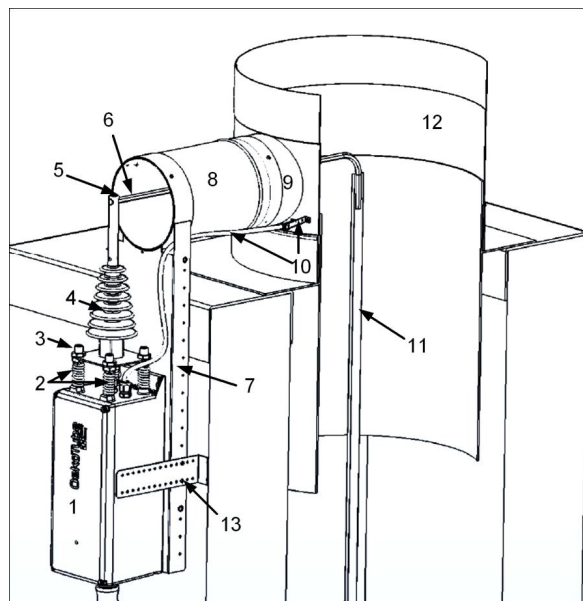


Conclusions

This trial has established that an ESP filter can work effectively on domestic coal and coal-wood fires in the Reefton Airshed during Winter months. Monthly monitoring of the OekoTube on two domestic fires in Reefton between May and September showed that soot dust containing PM₁₀ was retained on the flue wall and parts of the ESP device, with an overall increase in the thickness of soot between the start and finish of the trial. No major malfunctions occurred with the OekoTube when the device and burner were operated properly. The minor maintenance and operational matters identified in the course of the trial can be adequately dealt with by households to ensure that an ESP filter functions to its optimal capacity.

APPENDIX 1: DIAGRAM OF THE OEKOTUBE ELECTROSTATIC PRECIPITATION FILTER

15. Electronic box
16. Springs
17. Adjusting nuts
18. Insulator
19. Grub screw to fix the hexagonal electrode
20. Holder (6)
21. Hexagonal electrode holder (steel rod)
22. Electronic box mounting bracket
23. Extension pipe
24. T-piece connecting piece
25. Temperature sensor and cable holder
26. Flexible electrode
27. T-piece
28. Mounting bracket



APPENDIX 2 TRIAL RECORDING SHEET



Recording Sheet for OekoTube Dust Monitoring – Winter 2014

Physical address :

Date :

Time :

Contractor doing monitoring :

.....

Note if any re-entrainment (larger soot flakes) are present in the air or on the ground

(Include approx. date)

.....

.....

.....

1. Control light on circuit cover (tick the relevant circle)

All Red

Green flashing

All green

No lights

2. Dust colour on the insulator: rank from '1' being all white to '10' being dark black

Score:

If the dust is unevenly spread, describe where most and least dust occurs, using a clock face description, with 6 o'clock being at the point where the horizontal rod touches the flue wall.

Most dust located: o'clock Least dust located:
o'clock

Description of the dust:

.....

Remarks:

.....

Photo No of the flue wall:

Photo No of the ruler:

6. Dust on flue wall at the bottom of the electrode, estimated in relation to distance between the wall and the electrode (max 75 mm):

Less than $\frac{1}{4}$ of the distance 0

About $\frac{1}{4}$ of the distance 0

About $\frac{1}{3}$ of the distance 0

About $\frac{1}{2}$ of the distance 0

More than $\frac{1}{2}$ of the distance 0

Description of the dust 'spikes':

.....

Photo No of flue wall at bottom of electrode:

General comments about the monitoring

.....

.....

.....

.....

.....

FEBRUARY 2014

PREPARED FOR
West Coast Regional Council

PREPARED BY
Emily Wilton, Environet Ltd
www.environet.co.nz



Evaluation of the
effectiveness of the
OekoTube ESP in the
management of PM₁₀ in
Reefton.



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EXECUTIVE SUMMARY

This report evaluates the likely effectiveness of the OekoTube Electrostatic Precipitator (ESP) in reducing PM₁₀ concentrations in Reefton. Ambient air monitoring carried out by the West Coast Regional Council indicates that concentrations of PM₁₀ in Reefton currently exceed National Environmental Standards for Air Quality (NESAQ) (50 µg m⁻³, 24-hour average, one allowable exceedence per year) regularly each winter. Compliance with the NES is required by September 2020 and an interim target of three exceedences must be met by 2016. A 56% reduction in PM₁₀ concentrations is required to meet the NES for PM₁₀ (Wilton, 2012).

A testing programme was undertaken to determine the effectiveness of the OekoTube in reducing particulate from coal burning. The tests were carried out in the Applied Research Services (ARS) laboratory in Nelson using two portable samplers located above and below the OekoTube. Tests were carried out over four days with measurements of particulate made each hour for 3-5 hours. The fuels used were sub bituminous coal, wood and sub bituminous coal and bituminous coal. Tests were made for start-up and for low burn and high burn settings.

The current emission factor used for burning coal on a multi fuel burner is around 21 g/kg. Data suggested an average value of around 18 g/kg. However it is noted that the appliance used in the test procedures is modern relative to existing burners in Reefton and a combination of wood and coal were used for some test runs. Based on the information available it is considered that the original value of 21 g/kg is still reasonable for emission inventory and management options assessment purposes.

The OekoTube ESP was most effective in reducing particulate emissions when the fire was operated at low burn setting (90-97% effective) compared with at high burn setting and was around 39% effective during start up. Emissions at high burn, however, were much lower than at low burn meaning the lower efficiency was less significant. The OekoTube was most effective when emissions reductions were important. Thus while the average efficiency across the burn cycles was around 47% the reduction in total emissions across the trialled burn cycle was around 58%.

While there are some limitations in the evaluation, including the absence of data across all aspects of burner operation, results suggest that requiring the installation and maintenance of the OekoTube ESP device on coal and multi fuel burners in Reefton in conjunction with a ban on the use of bituminous coals may be sufficient to achieve the NES for PM₁₀. If implementing this as a management option the West Coast Regional Council would need to be satisfied that operation and maintenance procedures are such that the effectiveness of the OekoTube in reducing PM₁₀ is permanent.

1 INTRODUCTION

The purpose of this report is to evaluate the likely effectiveness of the OekoTube Electrostatic Precipitator (ESP) in reducing PM₁₀ concentrations in Reefton.

Concentrations of PM₁₀ in Reefton currently exceed National Environmental Standards for Air Quality (NESAQ) (50 µg m⁻³, 24-hour average, one allowable exceedence per year) regularly each winter. In 2012 the NES was exceeded on 27 occasions. Compliance with the NES is required by September 2020 and an interim target of three exceedences must be met by 2016. A 56% reduction in PM₁₀ concentrations is required to meet the NES for PM₁₀ (Wilton, 2012).

An evaluation of management options for Reefton (Wilton, 2012) suggests the following options may be able to achieve adequate reductions in concentrations in Reefton:

- Prohibit outdoor rubbish burning and the use of open fires, no new installations of multi fuel burners and incentives to encourage 40% of household to replace solid fuel heating methods with cleaner heating options with a 15 year burner phase out, or;
- Prohibit outdoor rubbish burning and the use of open fires and multi fuel burners, or;
- Compulsory use of secondary technology such as ESPs for all coal burners and wood burners not complying with the NES design criteria for wood burners, assuming on going effectiveness of technology can be maintained.

The latter option however, required testing of ESP technology available in New Zealand to confirm that particle reduction efficiencies reported overseas were applicable to the New Zealand situation. This report evaluates the results of testing of the OekoTube ESP device in terms of implications for air quality management in Reefton.

1.1 The OekoTube ESP

The OekoTube ESP is an electrostatic precipitator manufactured by OekoSolve of Switzerland to reduce particulate emissions from small scale burning devices up to 40 kW heat output. The OekoTube removes particles using a high voltage electrode which releases electrons into the chimney space containing the particles. The particulates become polarised and move towards the chimney wall and accumulate into coarser material on the chimney wall. It is intended that the resulting particulate matter be removed from the chimney wall by a chimney sweep.

In evaluating their effectiveness it is important to note that electrostatic precipitators such as the OekoTube use an electronic charge to remove particulate emitted from the fire that is in particulate form in the chimney. They do not remove the volatiles that are in gaseous forms when passing the ESP that will condense out to form particulates at lower temperatures. The effectiveness of the OekoTube in reducing PM₁₀ from domestic heating will therefore depend on the amount of volatiles in the air stream and the temperature of the flue at the point where the ESP is functioning.

2 EMISSIONS FROM COAL BURNERS

The objective of the study was to evaluate the effectiveness of the OekoTube in reducing particles from the coal burner. However, the study also provides information on the mass emissions from coal fired burners in New Zealand. While the sample size was small the data are useful as current emission factors are also based on limited data.

Table 2.1 shows the total burner emissions for each test phase for the pre-OekoTube sampler (prior to removal of particulate). This shows the operation of the burner is significant in terms of PM₁₀ emissions with high burn results around 6 g/kg compared with around 28 g/kg for low burn using sub bituminous coal or a mix of sub bituminous coal and wood. Only one test was conducted with bituminous coal but results indicated a high burn emission of around 8 g/kg and a low burn emission around 68 g/kg.

The average emission factors used for coal/ multi fuel burners in the emission inventories and management options assessments is 21 g/kg. The weighted average of the four days from the real life testing based on 19% bituminous and 81% sub bituminous coal is 18 g/kg. It should be noted, however, that the appliance that was used for the testing was a modern multi fuel burner which may be less polluting and not necessarily representative of the Reefton burner fleet.

Figure 2-1: Summary of test data for particulate emissions prior to exposure to the OekoTube ESP device (B = before)

Phase name	Phase	Run 1 (B)	Run 2 (B)	Run 3 (B)	Run 4 (B)
Start up	1	13	11	15	
High burn	2	7	8	4	4
High burn	3	5	5	2	8
Low burn	4	25	56	27	68
Low burn	5	9	24	15	
Average		12	21	13	27

3 OEKOTUBE TESTING

3.1 Study design and testing

The study design aimed to provide information on the effectiveness of the Oekotube at various stages of the burn cycle, for a typical sub bituminous coal used in Reefton and using a combination of wood and coal.

The original design was for a three day programme with the following objectives:

Day one – standard burn cycle using sub bituminous coal (Giles Creek)

Day two – standard burn cycle using wood and coal (50:50 mix) (Giles Creek and beech wood 33% wet weight)

Day three – simulated real life operating

The standard burn cycle was:

Phase 1 – start up (one hour)

Phase 2 – high burn (one hour)

Phase 3 – high burn (one hour)

Phase 4 – low burn (one hour)

Phase 5 – low burn (one hour)

Some additional funding was also provided to test the impact of the OekoTube on bituminous coal (day 4). Day four used bituminous coal and measured particulate for phases 2, 3 and 4.

Testing was carried out as detailed in Applied Research Services Limited, (2014). The test method used two portable samplers and accuracy checks were made using the dilution tunnel method specified in the NZS 4013: 1999. A good correlation between the portable samplers and the dilution tunnel was observed ($r^2 = 0.93$). A linear regression plot of the dilution tunnel (y axis) versus the portable sampler gave a slope of 0.94. However, no adjustments were made to the portable sampler values in this analysis owing to the strong influence of one data point on the slope.

The method of determining the effectiveness of the OekoTube was comparison of PM_{10} measured before passing across the OekoTube by using a portable sampler located in the flue prior to ESP exposure to PM_{10} measured after exposure to the OekoTube. In both cases the PM_{10} is extracted from the flue but mass measurements are made after cooling to allow the measurement of condensables. The difference in PM_{10} between the two samplers is assumed to be the effectiveness of the OekoTube.

In addition the Applied Research Services Limited (ARS) report indicates an estimate of effectiveness made by comparing PM_{10} measured using the dilution tunnel (from the top of the flue) to the amount removed by the ESP and retained on the inside of the chimney. The latter particulate is collected by sweeping the inside of the chimney after each phase. Using this method the ARS report indicated that the ESP was removing around 30% of the particulate.

3.2 Results

Results from the testing are detailed in the ARS report 14/2660 (Applied Research Services Limited, 2014). A summary is given in Table 3.1 which shows the particulate emissions testing before (B) and after (T) exposure to the OekoTube ESP device. The percentage reduction for each phase and each run is shown in Table 3.2.

The ARS report also identified a strong temperature dependence on the effectiveness of the OekoTube in reducing particulate. Figure 3.1 shows the relationship between flue temperature (top) and the effectiveness of the OekoTube (expressed as ratio of bottom (B) sampler particulate concentrations to top (T) sampler particulate concentrations - a high value indicating more effective operation of the OekoTube). Results illustrate low emissions when flue temperatures are high and limited effectiveness of the OekoTube for flue temperatures more than 120 degrees C at the top of the flue. At temperatures below 70 degrees the OekoTube is typically more effective in removing particulate. The exception is for the one test of bituminous coal under low burn conditions when the temperature was 65 degrees C at the top of the flue and the effectiveness of the OekoTube was low (ratio value of 1.4:1).

Figure 3-1: Summary of test data for particulate emissions (g/kg) above (T) and below (B) the OekoTube ESP device

Phase name	Phase	Run 1 (T)	Run 1 (B)	Run 2 (T)	Run 2 (B)	Run 3 (T)	Run 3 (B)	Run 4 (T)	Run 4 (B)
Start up	1	7	13	9	11	6	15	10	4
High burn	2	4	7	11	8	4	4	11	8
High burn	3	3	5	5	5	2	2		
Low burn	4	1	25	2	56	3	27	48	68
Low burn	5	1	9	1	24	0	15		
Average		3	12	6	21	3	13	23	27

Figure 3-2: Percent particle reduction efficiency

Phase name	Phase	Run 1 % reduction	Run 2 % reduction	Run 3 % reduction	Run 4 % reduction
Start up	1	44%	16%	57%	-131%
High burn	2	44%	-40%	-16%	-26%
High burn	3	41%	0%	19%	
Low burn	4	97%	97%	90%	30%
Low burn	5	92%	95%	97%	
Average		64%	33%	49%	-25%
Average (no negatives)		64%	42%	53%	30%

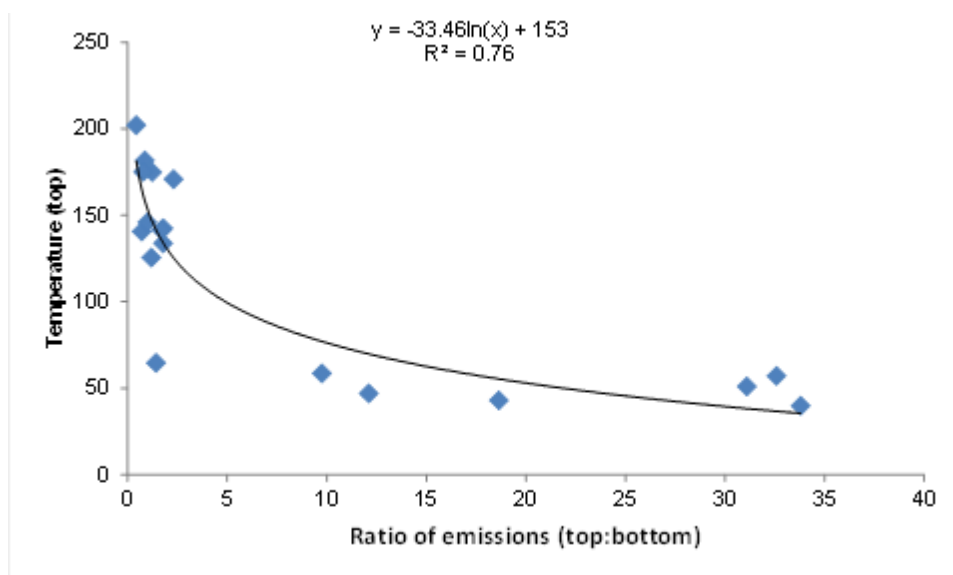


Figure 3-3: Estimated impact of requiring coal and multi fuel burners install and maintain an operating OekoTube ESP.

Thus results indicate the effectiveness of the OekoTube is temperature dependent and a much greater efficiency is observed when the appliance is operated on low burn and consequently the flue temperatures are low. This is likely to occur because the lower the flue temperature the greater the proportion of what would be particulate at ambient temperatures is in particulate form in the flue. The ESP device is only effective in removing particles and does not target volatile gases that will condense into particulate. The temperature dependence of the ESP means that additional attention should be given to the burn cycle and how burners are operated in real life.

No information is available on the average burner operating cycle and the proportion of time a burner is operated at low, medium or high. In addition no information is available on the effectiveness of the burner at medium burn. A realistic burn cycle of 12% high burn, 38% medium and 50% low is used for this assessment. Medium burns are assumed to be similar in emissions to the high burn as the temperature data suggests that the flue temperature needs to be less than 70 degrees C for the OekoTube to be highly effective and it would seem likely that medium burn rates would result in temperatures between 70 and 120 degrees. In reality it is also probable that medium burn rates will produce more particulate than high burn rates and the effectiveness of the OekoTube is uncertain. This creates a degree of uncertainty around the analysis.

The average particle reduction efficiency is around 47% when negative data are excluded from the analysis¹. However, the device is more effective when emissions are highest so a weighted efficiency estimate is required. Based on a 50:50 split between high and low burn outputs and a 19:81 split of bituminous to sub bituminous coal use, the average emission factors are 18 g/kg and 7.5 g/kg for pre OekoTube and post OekoTube respectively. This gives a weighted average efficiency of around 59%.

It is worth noting that this method of evaluating data indicates the OekoTube is much more effective than indicated using the sweeping method from the ARS report (30%). The reason for the difference is unclear although it may be possible that accumulated particulate is falling back into the fire rather than being retained on the chimney walls and consequently is not being measured in the "sweeping".

In addition, the OekoTube appears to be less effective with the bituminous coal (30% compared with 90%+) under the low burn conditions. It is important to note the significant limitations of a single data point for this observation. However, if the OekoTube is less effective with the bituminous coal then a further reduction in PM₁₀ emissions would be expected if the use of bituminous coal were also prohibited.

¹ There is no physical mechanism for explaining a negative impact that occurs as a result of the OekoTube. Hence it is assumed that negative values occur for other reasons e.g., condensation of volatiles.

4 MANAGEMENT OPTIONS FOR REDUCING PM₁₀

The assessment of management options for reducing PM₁₀ concentrations in Reefton (Wilton, 2012) includes an evaluation of the impact of prohibiting the use of bituminous coals as well as introducing the requirement for secondary technology such as the OekoTube ESP device for reducing PM₁₀ emissions. Both existing assessments rely on assumptions relating to the effectiveness of each option. Reanalysis of the effectiveness of these options based on the test data is required.

4.1 Impact of prohibiting the use of bituminous coal

A reduction of around 9% was estimated if bituminous coal was prohibited based on PM₁₀ emission estimates of 18 g/kg and 32 g/kg for sub bituminous and bituminous coal respectively. Results from the analysis suggest a slightly greater differential of 15 g/kg to 31 g/kg. The estimated reduction in PM₁₀ emissions based on these data is around 12%.

4.2 Impact of requiring households to install and maintain an ESP device such as the OekoTube

The use of secondary control measures such as the OekoTube was estimated for Reefton based on the assumption of a 65% efficiency for PM₁₀ reduction for wood and coal, and the assumption that the ESP is effective and maintained for the duration of the burners life. This suggested that the device may be effective in reducing PM₁₀ concentrations to meet the NES. It is important to note that attention would need to be given to the ongoing maintenance requirements for ESPs to ensure that this assumption is valid. It would not be a set and forget type of regulation if imposed on Reefton as a management measure to reduce PM₁₀ concentrations.

Results from this testing indicate that the OekoTube ESP is very effective in reducing PM₁₀ concentrations from coal burning at low temperatures when particulate emissions are highest. Limited testing of the effectiveness of the OekoTube on wood burning carried out for Environment Canterbury suggests the OekoTube is less effective for wood burning because of the higher proportion of condensable particulates that are gaseous when passing the ESP. Figure 4.1 shows the estimated impact of requiring an ESP device with the estimated effectiveness of the OekoTube based on a 58% particle reduction efficiency in Reefton. Note this scenario does not include the requirement of an ESP device on wood burners in Reefton.

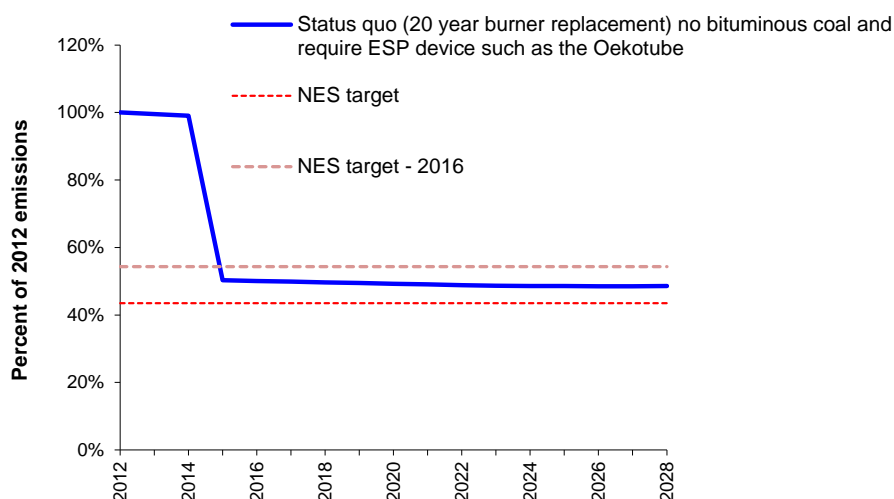


Figure 4-1: Estimated impact of requiring coal and multi fuel burners install and maintain an operating OekoTube ESP.

4.3 Impact of OekoTube and prohibiting the use of bituminous coal

Test data suggest that PM_{10} emissions from burning of bituminous coal are higher than for sub bituminous coal and that the OekoTube is much less effective in reducing particulate emissions from bituminous coal. The post scrubbing emissions for bituminous coal were still higher at 23 g/kg than for the other fuels (3, 3 and 6 g/kg) and the efficiency under low burn for the one test result was significantly lower at 30% compared with greater than 90%. This suggests additional benefits of prohibiting the use of bituminous coal. Figure 4.3 shows the estimated impact of requiring OekoTubes be fitted to all coal and multi fuel burners in Reefton as well as prohibiting the use of bituminous coal. Note however, the analysis is made in the absence of information on the impact of a medium burn and a relatively small sample size which increases the uncertainty.

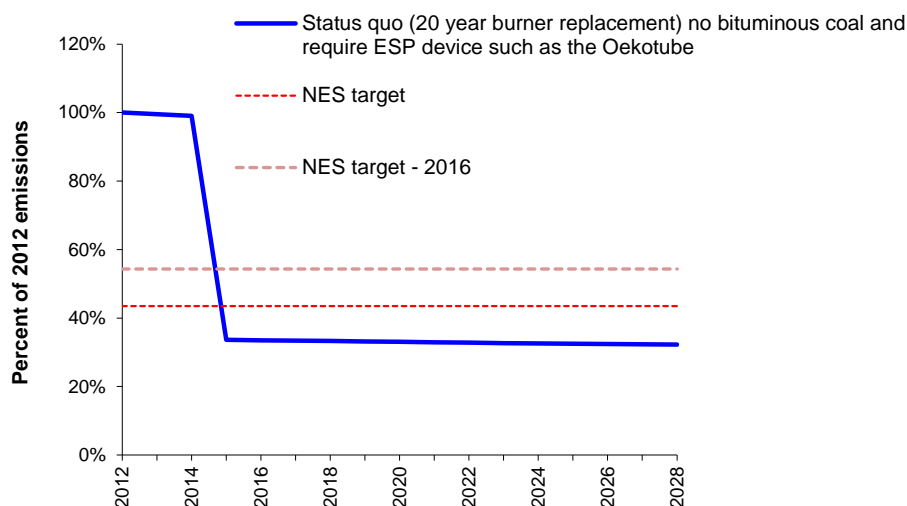


Figure 4-2: Estimated impact of requiring coal and multi fuel burners install and maintain an operating OekoTube ESP as well as prohibit the use of bituminous coal in Reefton

4.4 Practicalities of implementation

Council would need to be satisfied that the OekoTube can be adequately operated and maintained such that its effectiveness in reducing PM₁₀ is perpetual.

It is also important to consider issues of commerciality in writing any rules around the use of ESP devices in Reefton. One option might be to specify a required efficiency that must be demonstrated in a similar situation to the OekoTube testing. In addition it would be of value to specify some design characteristics to ensure overly noisy ESPs or devices that required impracticable maintenance or were easy to tamper with were excluded for example.

5 SUMMARY

Concentrations of PM₁₀ in Reefton currently exceed National Environmental Standards for Air Quality (NESAQ) (50 µg m⁻³, 24-hour average, one allowable exceedence per year) regularly each winter. A 56% reduction in PM₁₀ concentrations is required to meet the NES for PM₁₀ (Wilton, 2012). Compliance with the NES is required by September 2020. In addition measures to reduce PM₁₀ concentrations to no more than three exceedences of 50 µg/m³ are required to be effective by September 2016.

The OekoTube is an electrostatic precipitator which reduces particulate emissions from the flue of a small scale solid fuel burner. The effectiveness of the OekoTube in reducing particulate from coal burning was tested in the ARS laboratory during January 2014. Tests were carried out over four days with measurements made each hour for 3-5 hours. The fuels used were sub bituminous coal, wood and sub bituminous coal, and bituminous coal. Tests were made for start-up and for low burn and high burn settings.

The average emission factor from the testing was 18 g/kg (weighted average based on 81% sub bituminous coal use) and compares with an average emission factor typically used for coal burning in emission inventories and management options assessments of 21 g/kg. It is considered a reasonable agreement because the testing involved some wood burning (which typically has a lower emission) and because the appliance used was more modern than the majority of coal and multi fuel burners used in Reefton.

Emissions from bituminous coal (one burn cycle only) were about double those from sub bituminous coal.

The OekoTube ESP was most effective in reducing particulate emissions when the fire was operated at low burn setting (90-97% effective) compared with at high burn setting, and was around 39% effective during start up. Emissions at high burn, however, were much lower than at low burn meaning the lower efficiency was less significant. The OekoTube was therefore most effective when emissions reductions were important. Thus while the average efficiency across the burn cycles was around 47% the reduction in total emissions across the trialed burn cycle was around 58%.

A significant observation was that the OekoTube had reduced effectiveness for the one burn cycle when bituminous coal was used.

The impact of regulations including the installation of an OekoTube (or similar) ESP on ambient air quality and compliance with the NES was evaluated. Results suggested that this option, when combined with a 20 year wood burner phase out rule, would probably not be sufficient to meet the NES. However, the inclusion of an additional rule prohibited the burning of bituminous coal is likely to significantly increase the probability of achieving compliance.

If the use of an ESP device such as the OekoTube is included as a regulatory tool for managing PM₁₀ concentrations in Reefton then Council would need to be satisfied that the OekoTube can be adequately operated and maintained such that its effectiveness in reducing PM₁₀ is perpetual.

REFERENCES

Applied Research Services Limited. (2014). Testing of the OekoTube Electrostatic Precipitator on Coal Emissions. Applied Research Services Report 14/2660.

Wilton, E. (2012). Management options for reducing PM10 concentrations in Reefton - 2012 update. West Coast Regional Council.

5.1.2

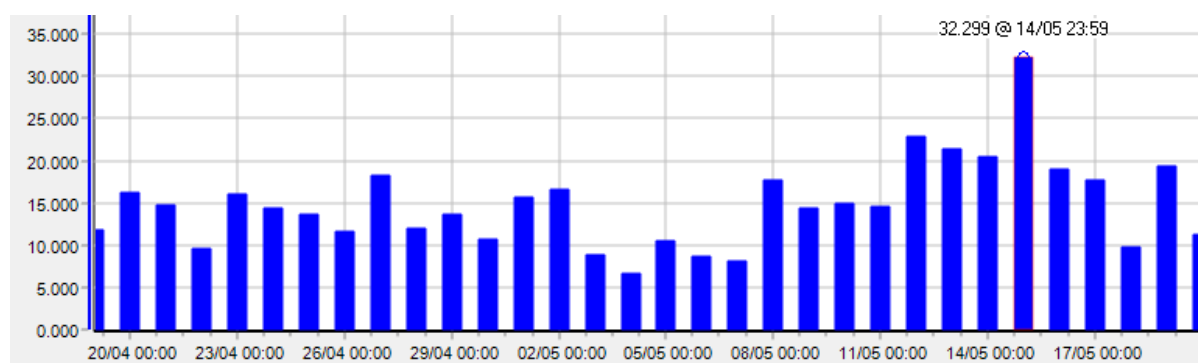
THE WEST COAST REGIONAL COUNCIL

Prepared for: Resource Management Committee – 9 June 2020
 Prepared by: Jonny Horrox, Team Leader – Water Quality
 Date: 28 May 2020
Subject: REEFTON AIR QUALITY SUMMARY

There have been no exceedances of the Resource Management (National Environmental Standards for Air Quality) Regulations 2004 for PM₁₀ in Reefton so far this year (Figure 1).

The new Teledyne T640x air quality machine is operational, but not yet fully calibrated. Data presented in this report is from our existing BAM air quality machine which continued to operate and send data via telemetry during the Covid-19 level 4 and 3 lockdown period. One maintenance visit was conducted during level 3 to calibrate the BAM machine. It was conducted under strict Health and Safety guidelines.

Figure 1. Reefton daily PM₁₀ for 2020.



Envirolink - Three Additional Air Quality Related Projects.

Covid-19 restrictions have led to the cancellation of Envirolink projects around the country, which at short notice allowed for three Reefton air quality projects to be initiated this financial year. The grant funding for the Council equates to \$60,000.

The first project involves a thorough desktop analysis of Reefton's historic meteorological data. This will help us understand how Reefton's meteorology has changed over time, specifically in relation to our particulate monitoring results. The second project will evaluate spatial differences in particulates (PM₁₀ and PM_{2.5}) across the Reefton air shed, using a range of temporarily installed monitoring devices. The third and final project will focus on validating the machines we are using at the current monitoring site, and establish ways to compare data between machines and across the historical record.

RECOMMENDATION

That the report is received.

Hadley Mills
Planning, Science and Innovation Manager

THE WEST COAST REGIONAL COUNCIL

Prepared for: Resource Management Committee 9 June 2020
 Prepared by: Jorja Hunt – Consents and Compliance Monitoring Officer
 Date: 27 May 2020
Subject: CONSENTS MONTHLY REPORT

This report covers March, April and May 2020 due to March and April reports being deferred during the Covid-2019 lockdown period. Consent work continued remotely during this period, however site visits were suspended.

0 Consents Sites Visit were undertaken 27 February to May 27 2020

12 Non-Notified Resource Consents were Granted 27 February to May 27 2020

CONSENT NO. & HOLDER	PURPOSE OF CONSENT
RC-2020-0028 New Zealand Transport Agency Fox Hills	To undertake earthworks on slopes greater than 25 degrees associated with underpinning of the State Highway, Fox Hills.
RC-2020-0027 Arnold Contracting Limited Harold Creek	To disturb the dry bed of Harold Creek for the purpose of extracting gravel.
RC-2020-0025 Westroads Limited - Greymouth Office Flower Street, Greymouth	To take groundwater via two bores for the purpose of washing gravels. To discharge water from washing gravel into the coastal marine area.
RC-2020-0011 WestReef Services Limited Multiple Buller sites	To disturb the dry bed of the Maruia River for the purpose of gravel extraction. To disturb the dry bed of the Big Totara River for the purpose of gravel extraction. To disturb the dry bed of Bullock Creek for the purpose of removing gravel. To disturb the dry bed of Landing Creek for the purpose of removing gravel. To undertake earthworks associated with land based gravel extraction, McPaddens Pit, Westport.
RC-2020-0033 C Hutchinson North Beach Road, Greymouth	To discharge treated onsite sewage wastewater from a domestic dwelling to land in circumstances where it may enter water at 332B North Beach Road, Point Elizabeth.
RC-2020-0024 Cranley Farms Limited Kawhaka	To undertake earthworks associated with contouring/flipping activities, Kawhaka. To discharge sediment associated with contouring/flipping activities to land where it may enter water, Kawhaka.
RC-2020-0037 DS Subritzky Gillams Road, Hokitika	To discharge treated onsite sewage wastewater from a domestic dwelling to land at Lot 4 DP 3304 BLK XIV, Gillams Gully Road.

RC-2017-0116
No. 8 Limited
McCulloughs Creek, Whataroa

To disturb the bed and banks of McCulloughs Creek to install and maintain a hydro electricity generation scheme, Whataroa.

To take and use surface water from McCulloughs Creek for hydro electricity generation, Whataroa.

To divert water from McCulloughs Creek for hydro electricity generation, Whataroa.

To discharge water containing contaminants to water associated with hydro electricity generation, McCulloughs Creek, Whataroa.

RC-2020-0003
New Zealand Transport Agency
Black Creek near Karangarua

To disturb the bed of Black Creek to undertake river protection works.

To temporarily discharge sediment to water associated with river works, Black Creek.

RC-2020-0047
KP & JM Kilkelly
Tasman View

To discharge treated onsite sewage wastewater from a domestic dwelling on Lot 1 DP 316853 to land in circumstances where it may enter water.

RC-2020-0046
Glenfern Property Limited
Franz Josef

To undertake bore pump testing and bore development in close proximity to a wastewater disposal system, Franz Josef.

RC-2014-0040-V1
WH Hassan
Blairs Road, Cronadun

To change conditions relating to the consented mining area within MP54317

Seven Changes to and No Reviews of Consent Conditions were granted in the period 27 February to May 27 2020

RC-2016-0110-V2
Roa Mining Company Limited
Rajah Pit, Roa Mine

To raise the Otto storm water sump area, Rajah Pit, Roa Mine.

RC-2019-0146-V1
TruLine Civil Limited
Ahaura

To allow green waste to be deposited with clean fill, Ahaura Bridge replacement works.

RC-2014-0159-V4
Prospect Resources Limited
Maori Gully

To undertake earthworks associated with land based gold mining on an additional area of land.

RC-2018-0096-V1
Brunner Station Limited
Aratika

To increase the area in which earthworks, including contouring, can take place, Aratika.

RC89038-V6
BT Mining Limited
Stockton Plateau

To move compliance monitoring point where samples are undertaken, Stockton Plateau

RC-2015-0167-V5
Greid Mining Limited
Stafford (MP53750)

To change the minerals permit number within the term and location of the consent

RC-2018-0049-V2
Aureon Limited
Stafford

To vary the unrehabilitated area associated with mining

Four Limited Notified and no Notified Resource Consents were granted in the period 27 February to May 27 2020

<p>RC-2019-0105 GJ Cooper Duffers Creek Road Stafford</p>	<p>To undertake earthworks associated with alluvial gold mining in the Westland District, Duffers Creek.</p> <p>To undertake earthworks associated with alluvial gold mining, Duffers Creek.</p> <p>To disturb the bed of an unnamed tributary of Duffers Creek associated with its diversion.</p> <p>To take surface water and groundwater via seepage associated with alluvial gold mining, Duffers Creek.</p> <p>To permanently divert water in an unnamed tributary of Duffers Creek associated with alluvial gold mining.</p> <p>To discharge contaminants to land where it may enter water associated with alluvial gold mining, Duffers Creek.</p>
<p>RC-2019-0117 West Coast Regional Council Karamea</p>	<p>To permanently divert flood water from a stopbank, Karamea.</p>
<p>RC-2019-0040 Hokitika Gold Limited Houhou</p>	<p>To undertake earthworks associated with alluvial gold mining in the Westland District, Hou Hou Terrace.</p> <p>To undertake earthworks associated with alluvial gold mining, Hou Hou Terrace.</p> <p>To undertake works on the bed of an unnamed creek associated with its diversion, Hou Hou Terrace.</p> <p>To take surface and groundwater via seepage associated with alluvial gold mining, Hou Hou Terrace.</p> <p>To divert water in an unnamed creek associated with alluvial gold mining, Hou Hou Terrace.</p> <p>To discharge contaminants to land where it may enter water associated with alluvial gold mining, Hou Hou Terrace.</p>
<p>RC-2017-0132 ZA & SM Darrell Partnership Waimangaroa River</p>	<p>To disturb the bed of the Waimangaroa River to undertake water diversion</p> <p>To permanently divert water in the Waimangaroa River as a result of river training</p>

RECOMMENDATION

That the June 2020 report of the Consents Group be received.

Heather McKay
Consents & Compliance Manager

5.2.2

THE WEST COAST REGIONAL COUNCIL

Prepared for: Resource Management Committee – 9 June 2020
 Prepared by: Heather McKay – Consents & Compliance Manager
 Date: 28 May 2020
 Subject: **COMPLIANCE & ENFORCEMENT MONTHLY REPORT**

Site Visits

A total of 86 site visits were undertaken during the reporting period, which consisted of:

Activity	Number of Visits
Resource consent monitoring	1
Mining compliance & bond release	30
Complaints	17
Dairy farm	38

Due to the Covid – 19 Lockdown this report covers the period of 28 February 2020 to 28 May 2020.

- A total of 34 complaints and incidents were recorded.

Non-Compliances

Note: These are the activities that have been assessed as non-compliant during the reporting period.

A total of eight non-compliances occurred during the reporting period.

Activity	Description	Location	Action/Outcome	INC/Comp
Discharge to water	A coal miner reported that they had a consent breach relating to sample results for metals exceeding their consented limits.	Stockton	An explanation was provided that after a prolonged dry period there was 230 mm of rain in a short duration which may have flushed material out. No further action was undertaken.	Incident
Gold mining	Complaint received regarding the discharge of sediment laden water from a gold mining operation.	Camerons	The site was visited and established that sediment laden water was escaping off the site into a road side drain. The discharge then entered a creek. As the discharge did not occur through the settling pond system it is an unauthorised discharge. A decision on enforcement action has not yet been made.	Complaint

Activity	Description	Location	Action/Outcome	INC/Comp
Discharge to land	A compliance officer observed a vehicle outside of a business premises being water blasted and contaminants entering a storm drain. The contaminant included a degreaser to remove oil.	Greymouth	A letter of direction has been sent to the business to undertake improvements to their system.	Incident
Stormwater & Earthworks	Complaint received that a neighbour has done earthworks to build up the height of his section. Also that a newly constructed boundary fence has caused flooding when a creek has burst its banks. The footing of the fence has prevented the floodwaters from escaping.	Granity	The site has been visited and established that the neighbour is not responsible for the flooding on the property. Some of the earthworks undertaken is not permitted as it is within 50 metres of the CMA and required resource consent. A letter of direction will be sent to the property owner.	Complaint
Gold mining	A compliance officer found a gold mining operation discharging untreated sediment laden water to a creek.	Stafford	This is a newly set up mining operation an abatement notice was issued to cease the discharge.	Incident
Dairy farming	A compliance inspection established that there was an unconsented discharge of dairy effluent into a stormwater drain	Kokatahi	The farmer has been advised to undertake remedial work. No decision has been made yet on enforcement action.	Incident
Discharge to water	A second complaint received regarding the discharge of sediment laden water from the gold mining operation at Camerons as noted above.	Camerons	The site was visited and established that sediment laden water was again escaping off the site into a road side drain. The discharge then entered a creek. As the discharge did not occur through the settling pond system it is an unauthorised discharge. A decision on enforcement action has not yet been made.	Complaint
Discharge to water	An assessment of non-compliant monitoring results has been undertaken regarding the discharges of milk factory waste water from WMP that has occurred between January 2020 and April 2020.	Hokitika	Enforcement action has been undertaken for the breach of consent conditions. A formal warning and two infringement notices were issued for exceedances.	Incident

Other Complaints/Incidents

Note: These are the other complaints/incidents assessed during the reporting period whereby the activity was not found to be non-compliant or compliance is not yet established at the time of reporting.

Activity	Description	Location	Action/Outcome	INC/Comp
Discharge to land	A coal miner reported that they have had a diesel spill to land of approx. 600 litres.	Stockton	Enquiries are ongoing.	Incident
Works in the bed of a river	Complaint received that a property owner has diverted a small creek.	Houhou	A site visit was undertaken and after viewing historical aerial images it was established that the creek had not been diverted.	Complaint
Earthworks	Complaint received regarding earthworks for track construction having the potential to cause erosion.	Woodstock	The site was visited and established that the works complied with permitted activity rules	Complaint
Works in the bed of a river	Complaint received regarding an excavator working in a creek.	Aratika	The site was visited and established that the excavator was working near the creek but not in it.	Complaint
Works in the bed of a river	Complaint received that a contractor was working in the wet bed of a river.	Hokitika	Enquiries were carried out and established that there was a consent in place which authorised the work.	Complaint
Discharge to air	Complaint received regarding the discharge of odour from the Westland Milk products site.	Hokitika	The site was visited and established that the odour was short in duration and was the result of plant maintenance.	Complaint
Discharge to water	Complaint regarding the water quality in the Ngakawau River. Complainant alleges that the water quality has deteriorated over recent years because of a coal mining operation.	Ngakawau	Enquiries established that the site is compliant with their discharge consent conditions. A recent fish survey also shows that fish numbers have increased of recent times.	Complaint
Discharge to water	Complaint received that a creek was running discoloured due to a coal mining discharge.	Roa	The site was investigated and established that the site was compliant at the time of the inspection.	Complaint
Gold Mining	Complaint received that a miner was working outside of their consented hours of operation.	Stafford	Enquiries were made with the miner who stated that they were doing farm work on the property that was not related to their consented mining operation.	Complaint
Discharge to water	Complaint received that there was an unusual foam on the beach at Taramakau.	Taramakau	Enquiries established that the foam is from natural processes.	Complaint
Stormwater	Complaint received that a neighbour has constructed an earth bund and this is causing stormwater to discharge onto his property.	Fairdown	Enquiries with the person who carried out the earthworks was undertaken and the stormwater rule was explained. The person has since remediated the situation.	Complaint

Activity	Description	Location	Action/Outcome	INC/Comp
Gravel Extraction	Complaint received regarding the extraction of gravel being undertaken to close to a state highway bridge.	Mawheraiti	When the person was contacted they had already finished extracting gravel and had remediated the site.	Complaint
Dead Sheep	Complaint received that sheep carcasses had been dumped in a creek and were causing an odour issue.	Rutherglen	The site was investigated and established that the carcasses were on the bank of the creek and were too decomposed to remove.	Complaint
Gravel Extraction	Complaint received regarding the extraction of gravel from a creek.	Fairdown	Enquiries established that the person was extracting a small volume under permitted activity rules.	Complaint
Works in the bed of a river	Complaint received that a contractor was working in the bed of a creek during fish spawning season.	Franz Josef	Enquiries established that the contractor was carrying out work for NZTA and voluntarily ceased working in the wet bed and worked from the bank instead.	Complaint
Earthworks	Complaint regarding a person undertaking earthworks on their property. The complainant was concerned that the work may cause erosion.	Barrytown	The site was visited and established that the person was complying with permitted activity rules.	Complaint
Riparian margin clearance	Complaint received regarding a person clearing vegetation from the riparian margin of a creek.	Birchfield	The site was visited and established that the clearance had taken place outside of the riparian margin of the creek.	Complaint
Noise complaint	Complaint received regarding the noise from a gold mining operation that had occurred several days prior to reporting the complaint.	Stafford	Enquiries were made with the miner who advised that he would undertake some mitigation to reduce the noise.	Complaint
Discharge to land	Complaint received regarding the dumping of rubbish near a creek. The complainant has observed a vehicle travelling up a creek bed and dumping bags of rubbish.	Marsden	Enquiries are ongoing.	Complaint
Noise complaint	Complaint received regarding noise from a gold mining operation.	Marsden	The monitoring of noise outside of the Westland District is not the responsibility of the Regional Council. The miner was notified of the complaint and was going to undertake mitigation measures.	Complaint

Activity	Description	Location	Action/Outcome	INC/Comp
Gold mining	Complaint regarding noise from a mine site and working outside of their consented hours.	Kaniere	Enquiries established that the person was not doing work related to their mining operation and was loading rock onto a truck that was not located at the mine site.	Complaint
Discharge to land	Complaint regarding the location of an offal pit being close to a road.	Fairdown	The site was visited and established that it was not an offal pit. It was a trench which contained rubbish on a private property which is permitted.	Complaint
Discharge to water	A gold miner reported that approx. 20 litres of diesel had discharged into their settling pond.	Blue Spur	The spill was contained in the pond and the miner remediated this himself. No action undertaken	Incident
Stormwater	The complainant alleges that flooding in his area after a heavy rain event is down to a neighbouring farm doing diversions and land contouring.	Cronadun	The site was investigated and the complaint was not substantiated. There was flooding in other areas as it was a heavy rain event.	Complaint
Discharge to water	Complaint received that there was an oil/diesel slick in the Hokitika River.	Hokitika	The site was investigated and a minor sheen was observed however the source was not located.	Complaint
Stormwater	Complaint received regarding flooding of a property in a heavy rain event. The property owner believes that someone has done a diversion which has directed water onto their property. Their property has flooded as the state highway culvert could not cope with the flood water.	Fairdown	The site has been investigated and established that this was a natural event where the creek was in flood and overwhelmed the state highway culvert causing the water to flow across the state highway and into the complainant's property. There is no breach of the regional rules.	Complaint

Update on Previously Reported Ongoing Complaints/Incidents

Activity	Description	Location	Action/Outcome	INC/Comp
Gold Mining	A compliance officer saw that a creek was discoloured with sediment which resulted in an inspection of a gold mining operation. As the discharge continued for several days a complaint was also received from the public.	German Gully	An inspection was undertaken of a gold mining operation which established the site had discharged significant amounts of sediment to the creek. An abatement notice was issued and further enforcement action is pending. Four infringement notices have now been issued. Two notices issued to the company and two notices issued to the director for discharges of sediment.	Incident / complaint

Formal Enforcement Action

Formal Warning: There was one formal warnings issued during the reporting period.

Activity	Location
Milk Factory: Discharge of waste water.	Hokitika

Infringement Notice: There were six infringement notices issued during the reporting period.

Activity	Location
Westland Milk Products: Two infringements for the discharge of waste water.	Hokitika
Gold Mining: Four notices issued for the discharge of sediment laden water. Two notices to the company and two notices to the director.	Marsden

Abatement Notices: There was one abatement notice issued during the reporting period.

Activity	Location
Gold Mining: One notice issued to cease the discharge of sediment laden water.	Stafford

Mining Work Programmes and Bonds

The Council received the following 33 work programmes during the reporting period. 32 of the work programmes have been approved. The remaining AWP has recently been received.

Date	Mining Authorisation	Holder	Location	Approved
24/02/2020	RC10217	Moore Mining Limited	Reefton	Yes
02/03/2020	RC09084	Goldstone Mining Group	Humphreys Gully	Yes
03/03/2020	RC10137	Boatman's Coal Ltd	Boatman's	Yes

09/03/2020	RC-2014-0170	Goldriver Mining Ltd	Butlers	Yes
09/03/2020	RC-2015-0112	Goldriver Mining Ltd	Waimea	Yes
12/03/2020	RC12164	Madden Mining Ltd	Chesterfield	Yes
17/03/2020	RC-2018-0107	Robert Graham	Blue Spur	Yes
17/03/2020	RC-2019-0056	Titan Resources Ltd	Bell Hill	Yes
18/03/2020	RC-2017-0092	Fitzherbert Investments	Arthurstown	Yes
20/03/2020	RC-2015-0026	Ross Beach Mining Ltd	Maori Creek	Yes
23/03/2020	RC-2014-0013	Roa Mining Company Ltd	Roa	Yes
23/03/2020	RC07012	Roa Mining Company Ltd	Roa	Yes
23/03/2020	RC10194	Roa Mining Company Ltd	Roa	Yes
23/03/2020	RC10186	Roa Mining Company Ltd	Roa	Yes
23/03/2020	RC-2014-0109	Roa Mining Company Ltd	Roa	Yes
23/03/2020	RC-2016-0110	Roa Mining Company Ltd	Roa	Yes
31/03/2020	RC07022	Francis Mining Co Ltd	Reefton	Yes
31/03/2020	RC12180	New Creek Mining Ltd	New Creek	Yes
31/03/2020	RC09108	Francis Mining Co Ltd	Reefton	Yes
31/03/2020	RC09035	Francis Mining Co Ltd	Reefton	Yes
31/03/2020	RC09120	Francis Mining Co Ltd	Reefton	Yes
02/04/2020	RC96051	Birchfield Coal Mines Ltd	Giles Creek	Yes
02/04/2020	RC90027	Birchfield Coal Mines Ltd	Island Block	Yes
07/04/2020	RC-2015-0109	Dempster and Phoenix Ltd	Callaghans	Yes
15/04/2020	RC-2016-0088	Roundhill & Inwood	Landing Creek	Yes
16/04/2020	RC-2014-0159	Prospect Resources Ltd	Maori Gully	Yes
20/04/2020	RC12089	Fahey Contracting Ltd	Red Jacks	Yes
30/04/2020	RC10193	Buller Coal Ltd	Escarpment	Yes
05/05/2020	RC-2016-0034	Amalgamated Mining Ltd	Notown	Yes
08/05/2020	RC-2016-0100	JA Morley Family Trust	Ahaura	Yes
11/05/2020	RC-2019-0040	Hokitika Gold Limited	Hokitika	Yes
25/05/2020	RC11001	Phoenix Mining Ltd	Nemona Forest	No
26/05/2020	2017-0114	Paramount Mining Ltd	Hokitika	Yes

Two bonds have been received during the reporting period

Date	Mining Authorisation	Holder	Location	Amount
12/03/2020	RC-2019-0141	Ross Beach Mining Ltd	Maori Gully	\$7,344.00

20/03/2020	RC-2015-0026	Longford Holdings Ltd	Rimu	\$12,000
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Three bonds are recommended for release

Mining Authorisation	Holder	Location	Amount	Reason For Release
RC13158	Hokitika Gold Ltd	Hokitika	\$15,000	Mining has concluded, rehabilitation completed
RC98005	MJK Mining Ltd	Bell Hill	\$12,000	Mining has concluded, rehabilitation completed
RC91038	Francis Mining Ltd	Roa	\$5,000	Mining has concluded, rehabilitation completed

RECOMMENDATIONS

- 1. That the June 2020 report of the Compliance Group be received.*
- 2. That the bond of \$15,000 for RC13158 Hokitika Gold Ltd, \$12,000 for RC98005 MJK Mining Ltd and the \$5,000 for RC91038 Francis Mining be released.*

Heather McKay
Consents and Compliance Manager

COUNCIL MEETING

THE WEST COAST REGIONAL COUNCIL

Notice is hereby given that an **ORDINARY MEETING** of the West Coast Regional Council will be held in the Offices of the West Coast Regional Council, 388 Main South Road, Greymouth on **Tuesday, 9 June 2020** commencing on completion of the Resource Management Committee Meeting

A.J. BIRCHFIELD
CHAIRPERSON

M. MEEHAN
CHIEF EXECUTIVE OFFICER

<u>AGENDA NUMBERS</u>	<u>PAGE NUMBERS</u>	<u>BUSINESS</u>
1.		APOLOGIES
2.		PUBLIC FORUM
3.		MINUTES
	1 – 4	3.1 Minutes of Council Meeting 14 May 2020
4.		REPORTS
	5 – 7	4.1 Engineering Operations Report
	8 – 9	4.2.1 Annual Plan 20/21 & TTPP Joint Committee Budgetary and Funding Report
	10	4.2.2 Borrowing June 2020
5.	11	CHAIRMAN'S REPORT
6.	12	CHIEF EXECUTIVE'S REPORT
7.		GENERAL BUSINESS

THE WEST COAST REGIONAL COUNCIL**MINUTES OF THE MEETING OF THE COUNCIL HELD ON 14 MAY 2020,
AT THE OFFICES OF THE WEST COAST REGIONAL COUNCIL, 388 MAIN SOUTH ROAD, GREYMOOUTH,
COMMENCING AT 10.30 A.M.****PRESENT:**

A. Birchfield (Chairman), S. Challenger, P. Ewen, D. Magner, B. Cummings, J. Hill, L. Coll McLaughlin

IN ATTENDANCE:

M. Meehan (Chief Executive), R. Mallinson (Corporate Services Manager), R. Beal (Operations Director),
T. Jellyman (Minutes Clerk), J. Hawes (IT Support).

1. APOLOGY:

There were no apologies.

2. PUBLIC FORUM

There was no public forum.

3.1 CONFIRMATION OF MINUTES

The Chairman asked the meeting if there were any changes to the minutes of the previous meeting.
There were no changes requested.

Moved (Ewen / Coll McLaughlin) *that the minutes of the Council meeting dated 28 April 2020, be confirmed as correct, with the minor amendment below made.*

Carried

Cr Coll McLaughlin stated that Westport had two projects submitted as part of the Covid 19 Economic Recovery Infrastructure, and not just one as documented in the minutes. The second project is Westport flood protection, with construction of extensive stopbanks designed to prevent floodwaters from inundating large numbers of properties at a total cost \$10M (funding sought \$7.5M).

Matters arising

There were no matters arising.

REPORTS:**4.1 OPERATIONS REPORT**

R. Beal spoke to his report and advised that work has been completed in the Punakaiki, Karamea, Wanganui, Taramakau and Inchbonnie rating districts. He advised that repair work on the Greymouth Floodwall was suspended during lockdown due to the amount of people accessing the floodwall as the correct social distancing was unable to be maintained. R. Beal advised that work will recommence next week.

R. Beal advised that quarry waste from the Inchbonnie Quarry has been used to top up protection work along the Taramakau River. R. Beal answered questions from Councillors.

Moved (Magner / Challenger) *That the report is received.*

Carried

4.1.1 COASTAL EROSION – COBDEN

R. Beal spoke to this report and advised there has been severe erosion around Jellyman Park. He stated that Council engineers are happy with the recommendations in the NIWA report. 2

Moved (Challenger / Cummings)

1. *That Council receives this report.*
2. *That the NIWA Report is received and provided to Grey District Council*

Carried

4.1.2 COASTAL EROSION – HOKITIKA RATING DISTRICT

R. Beal spoke to this report and stated that the erosion between the seawall and the Hampden Street groyne is being monitored two to three times a month, as well as the area between Tudor Street and Richards Drive. R. Beal advised that the report reveals that the northern most groyne at Richards Drive is working, but the southern groynes are not working as good. He advised that the recommendation is to leave the groynes in place, and to not do any work near the river mouth. Cr Cummings stated that the groynes need to be stood back up to stop water getting behind. Discussion took place, R. Beal advised that the southern groynes do need to be beefed up. Cr Challenger agreed and stated that the groynes need to be re-shaped. Cr Challenger stated that he will be visiting the areas tomorrow at the request of a ratepayer. Cr Challenger spoke of change in sea patterns and advised that seawalls are only a temporary measure. Cr Challenger stated that options to retreat in Hokitika need to be considered along with a coastal hazard management plan. Cr Challenger stated that the Beca Report is a sound report.

Moved (Challenger / Magner)

1. *That the report is received.*
2. *That the BECA report is received and provided to the Hokitika Seawall Joint Committee.*
3. *That following further advice Council support an application to extend the Hokitika seawall to the Crown Infrastructure Projects Fund.*

Carried

4.2 CORPORATE SERVICES MANAGERS MONTHLY REPORT

R. Mallinson spoke to his report and advised that this is the eight month report up to the end of March 2020. He reported that there is an accounting surplus \$1.38M. R. Mallinson advised that the investment portfolio has suffered a large reduction in value of \$865,000 during March, and had this not have occurred, he would have been reporting a surplus of \$2.2M. R. Mallinson stated that during April the portfolio bounced back considerably with an increase of \$550,000. He advised that the surplus includes \$1.2M of NEMA receipts and \$0.5M worth of insurance receipts. Cr Ewen asked if there was more income expected from NEMA with regard to the emergency event in Franz Josef. R. Mallinson responded that Council has received an interim insurance claim payment of \$0.5M but final settlement still to be agreed upon as there is still \$700,000 yet to come in. R. Mallinson answered questions relating to the investment portfolio and the Catastrophe Fund. He advised that the Catastrophe Fund will be refunded when the final settlement comes in from insurer, and this should be back up at around \$1M in a couple of years.

Moved (Ewen / Cummings) *That the report be received.*

Carried

4.2.1 RATES DEBTORS –ASSISTANCE TO RATEPAYERS UNABLE TO PAY INSTALMENT DUE 20 APRIL 2020

R. Mallinson spoke to this report and advised that this report recognises the impact of Covid -19 on some ratepayers, especially those who have suffered a substantial loss of income. Extensive discussion took place, M. Meehan stated that it will be useful to see how government plays this out and if council needs to do anything further to assist ratepayers. M. Meehan advised that Council is looking at a zero rate increase for next year. R. Mallinson answered questions from Councillors and provided historic information on this matter.

1. *Council agrees that ratepayers who did not pay the second rates instalment due on 20 April be identified and written to and given the opportunity to seek a payment deferral for six months from 20 April 2020 until 20 October 2020 if their wages income has decreased by at least 20% or business income by at least 30% due to COVID19 related impacts.*
2. *Appropriate declaration form to be developed to simplify the process.*
3. *Council to agree to waive all penalties relating to any amounts unpaid on 20 April, whether COVID19 related or not.*

Carried

4.2.2 MEMBERSHIP OF LOCAL GOVERNMENT NZ

R. Mallinson spoke to his report and advised that the cost of membership is \$33,314. Cr Challenger asked if the membership is forgone, would this impact on opportunities to borrow from the Local Government Funding Agency (LGFA). R. Mallinson confirmed that there would be no such impact. M. Meehan advised that every Council in New Zealand is a member of LGNZ and there are a lot more positives than negatives with being a member. He stated that at the moment LGNZ is going through a change with their Chief Executive about to stand down, and the President, Mr Dave Cull will leave his post in a month or so. M. Meehan advised that LGNZ have been very useful in petitioning with the Three Waters and they coordinate all of the Regional Sector meetings. M. Meehan stated that LGNZ has some very talented people who do a very good job in ensuring that the Local Government voice is heard. M. Meehan advised that Council should maintain membership. Cr Challenger agreed and stated that he has concerns with Mr Cull. The Chairman stated he objects to Mr Cull's anti-mining and anti-development stance. Cr Challenger stated that Mr Cull is still President of LGNZ but he is not an elected member, he queried whether a non-councillor should be able to keep this position. M. Meehan stated that if an elected member stands down as Mayor, while in the term as President of LGNZ, that individual has the choice of whether or not to continue with the term. M. Meehan stated that Mr Cull chose to continue in the role as LGNZ President until his term finishes in June or July this year. Cr Ewen stated that there may be changes with Mr Cull's departure, and he feels that Council could hold off and see what happens with the change of President. M. Meehan explained the process for putting forward a remit at the LGNZ annual meeting. Cr Coll McLaughlin stated that LGNZ has a lot of training resources available for new councillors. She is in favour of council retaining its membership but does have concerns with leadership. Cr Hill supports Cr Challenger's comments and would like a strongly worded letter sent to LGNZ. Cr Magner agreed with Cr Coll McLaughlin's comments regarding the training resources. The Chairman suggested that membership is reviewed each year. M. Meehan explained the National Council to the meeting, including the makeup of the sector and the zones for each sector. He advised that Cr Coll McLaughlin is part of the Policy Advisory Group which provides policy advice to the sector, and she attends the quarterly meetings in Wellington. Cr Ewen stated that Council's nomination should be considered if the rural voice is to be heard. M. Meehan advised that this needs to be done though Zone or the regional section. He stated that Mayor Smith made an attempt to secure this role but the Selwyn mayor got it. Discussion took place and it was agreed that the recommendation would be amended to include the change to the constitution, as discussed, and that Council review's its membership annually.

Moved (Challenger / Cummings)

1. *That Councillors continue its membership in Local Government New Zealand*
2. *That Council writes a letter to LGNZ confirming its membership but expressing its disappointment in Mr Cull's comments at the Minerals Conference.*
3. *Council would like to see the constitution changed to ensure that when an elected member stands down they do not have the President's role.*
4. *That Council annually reviews its membership.*

Carried

GENERAL BUSINESS

Cr Hill stated that he has received some customer complaints about flooding in culverts. He stated these seem to be more prevalent during lockdown. Cr Hill gave an example of a person who had contacted him expressing concern about the different agencies she had been advised to contact. Cr Hill stated that a lot of time is being spent duplicating things. M. Meehan agreed that this can type of complaint can be quite complicated as sometimes it could be an NZTA culvert that Buller District Council administer on their behalf. M. Meehan advised that Council looks at the rules to ascertain whether or not there has been a breach of

any rules and then checks to see if follow up is required before passing the complaint onto the appropriate agency. M. Meehan offered to put some comms in place for this type of complaint.

The meeting closed at 11. 25 a.m.

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Chairman

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Date

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THE WEST COAST REGIONAL COUNCIL

Prepared for: Council Meeting – 9 June 2020
Prepared by: Paulette Birchfield – Engineer, Brendon Russ - Engineer
Date: 29 May 2020
Subject: **ENGINEERING OPERATIONS REPORT**

Works Report – May 2020Wanganui Rating District

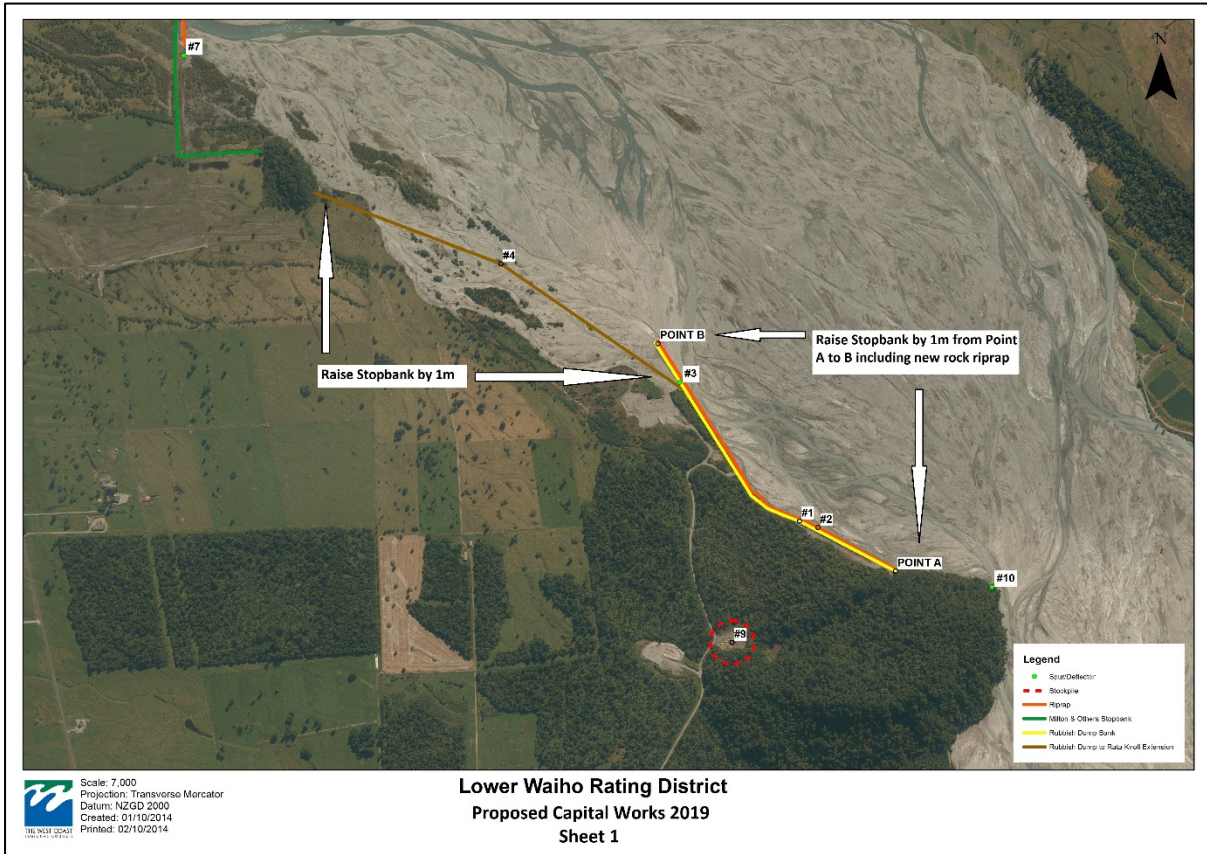
Work involving the placement of approximately 2500t of rock on the Wanganui River, below the State Highway bridge, was awarded to McKenzie Contracting at \$22/t + GST. This work will be claimed under our insurance from the March 2019 flood event.



Further work downstream from this area is currently being investigated.

Lower Waiho Rating District

Work involving the raising of the stopbanks from Canavans Knob to Rata Knoll has been completed. The bulk earthworks were carried out by Graeme Condon Contracting and the rock work was carried out by Glacier Concrete and Contracting.



**Quarry Rock Movements for the period February, March, April 2020
(excluding Royalty Arrangements)**

Quarry		Opening Stockpile Balance	Rock Sold	Rock Produced	Closing Stockpile Balance
Camelback	Large	0	1424	1424	0
Whataroa	Small/medium	9,056	0	0	9,056
	Large	7,500	0	0	7,500
Blackball		670	0	0	670
Inchbonnie		5,000	0	0	5,000
Kiwi		0	0	0	0
Miedema		0	0	0	0
Okuru		450	0	0	450
Whitehorse		1,334	0	0	1,334
Totals		24,010	1424	1424	24,010

Rock Requested

Quarry	Contractor	Amount	Permit Start	Permit Finish
Camelback	Henry Adams	202	31.01.20	28.02.20
Camelback	Henry Adams	943	12.02.20	19.02.20
Camelback	Henry Adams	279	09.03.20	12.03.20

RECOMMENDATION

That the report is received

Randal Beal
Director of Operations

THE WEST COAST REGIONAL COUNCIL

Prepared for: Council Meeting – 9 June 2020
 Prepared by: Robert Mallinson – Corporate Services Manager
 Date: 28 May 2020
 Subject: **ANNUAL PLAN 20/21 & TTPP JOINT COMMITTEE BUDGETARY AND FUNDING**

In assessing the impact of COVID-19 on our Regional Ratepayers Councillors agreed that Council could and should lessen these impacts with no increases in General, UAGC, ODP or Emergency Management rates collections.

My previous report to the April meeting included “placeholders only” for activity ODP pending more clarity from the Joint Committee on their exact budgetary requests. I identified that Council could get by with borrowing of \$485,000 to “balance the budget (prior to any ODP adjustments). The Joint Committee met on 28 May 2020 to finalise their budget requests to WCRC.

The budget sought is as follows:

Salaries	\$248,000
Consultant Planner	\$100,000
Governance	\$65,000
Research	\$100,000
Stakeholder engagement	\$17,000
Communications platforms	\$10,000
Legal advice	\$2,000
Share of WCRC overhead	\$150,000
TOTAL	\$692,000

Funding is the responsibility of WCRC as per the Order in Council. The ultimate responsibility and decisions with regard to the size of the budget adopted and the actual funding of the budget belongs to West Coast Regional Council who must of course give appropriate consideration to the Joint Committee budget requests.

Funding available to fund ODP activity is as follows:

Credit balance c/fwd from 19/20	\$100,000
Targeted rate	\$250,000
Existing WCRC general rate contribution	\$150,000
TOTAL	\$500,000

With the inclusion of the full Joint Committee budget requests, and holding of the ODP rate to only \$250,000; the Operating / Funding statement now looks as follows

Operating Statement	2019/20 LTP Budget	2020/21 LTP Budget	2020/21 AP Budget
General Rates	3,502,627	3,578,557	3,484,200
Investment Income	1,400,085	1,424,069	1,068,680
Economic Development	153,176	156,497	(0)
Resource Management	1,361,617	1,391,134	1,470,750
Transport	84,073	85,896	109,000
Emergency Management	1,174,350	1,199,808	1,166,890
River, Drainage & Coastal Protection	1,643,806	1,622,059	1,794,407
VCS Business Unit	3,971,346	4,057,436	4,925,850
Warm West Coast	13,068	10,420	6,750
Total Revenue	13,304,148	13,525,875	14,026,527
Governance	525,102	499,456	642,132
PCR/Rolleston	60,792	59,577	29,426
Economic Development	306,163	312,606	(0)
Resource Management	3,680,213	3,716,566	4,431,345
Transport	207,926	211,072	154,484
Hydrology & Floodwarning	1,004,809	1,150,401	1,051,096
Emergency Management	1,232,048	1,255,757	1,147,494
River, Drainage & Coastal	2,144,803	1,982,168	1,796,285
Bio-security	121,391	124,181	327,609
VCS Business Unit	3,460,845	3,535,705	4,404,954
Warm West Coast	8,482	6,453	3,386
Total Expenses	12,752,574	12,853,941	13,988,210
Surplus / (Deficit)	551,574	671,934	38,317
Less Surplus Belonging to Rating Districts			(888,274)
Plus carried forward ODP funds from 19/20			100,000
Funding Deficit			- 749,957

This funding deficit before borrowing is within the limit of what was agreed to at the April meeting.

The complete 20/21 Annual Plan cannot be submitted for approval until after Council has given consideration to the TTPP ODP budget request.

As previously agreed by Councillors, the 20/21 budget and Annual plan will be within the 2018/28 LTP financial envelope, with no increases proposed to the General rate, UAGC, ODP or Emergency Management rates. And ODP funding was consulted on in the 19/20 Annual plan.

Therefore no public consultation on the 20/21 Annual Plan is required.

Subject to the recommendations to follow, I will bring the final 20/21 Annual Plan document to Council for adoption at a Special Meeting in late June 2020.

RECOMMENDATIONS

1. *That Council agree to the TTPP proposed budget of \$692,000 for inclusion in the 20/21 Annual plan.*
2. *That funding be by way of;*
 - *Carry forward credit balance \$100,000 from 19/20.*
 - *Targeted Rate \$250,000*
 - *Existing General rate contribution \$150,000*
 - *Borrowing of balance of \$192,000*

Robert Mallinson
Corporate Services Manager

4.2.1

THE WEST COAST REGIONAL COUNCIL

Prepared for: Council Meeting 9 June 2020
 Prepared by: Robert Mallinson – Corporate Services Manager
 Date: 29 May 2020
Subject: Borrowing June 2020

Background

There are a number of Rating District capital works that require loan funding < 30 June 2020. These include:

	Anticipated spend to 30/6/20
Karamea stopbank upgrade and associated works	\$200,000
Greymouth Floodwall fix	\$150,000
Lower Waiho (Rata Knoll extension)	\$200,000
Hokitika seawall	\$200,000
	\$750,000

Following migration of debt to LGFA in 219, Council borrowing is now similar to a "Treasury" type funding model, where Council "lends internally" to Rating districts and other activities and ensures that there is "more or less" matching external funding in place to cover.

Funding required @ 30/6/20	\$8,315,000
Funding in place	
LGFA	\$7,600,000
Westpac	\$200,000
	\$7,800,000

Given that LGFA borrowing is required to be in \$1,000,000 parcels, I intend to borrow \$1,000,000 in June from LGFA. The rate for this borrowing will be at a fixed rate to 26 May 2026. Interest rate will be close to 1.30%

Current LGFA borrowing details are:

Maturing 26/11/20	\$2,000,000	Floating	0.62%
Maturing 30/5/22	\$1,400,000	Fixed	2.02%
Maturing 30/5/23	\$1,400,000	Floating	1.76%
Maturing 30/5/24	\$1,400,000	Fixed	2.27%
Maturing 30/5/25	\$1,400,000	Fixed	2.39%
	\$7,600,000		

Weighted average cost of borrowing of LGFA debt is currently 1.72%

RECOMMENDATIONS

1. That the report be received.
2. That Council notes the intention to borrow \$1,000,000 from LGFA during June 2020.

Robert Mallinson
Corporate Services Manager

5.0

THE WEST COAST REGIONAL COUNCIL

Prepared for: Council Meeting- 9 June 2020
Prepared by: Allan Birchfield – Chairman
Date: 28 May 2020
Subject: **CHAIRMAN'S REPORT**

Meetings Attended:

- I met with Mark Patterson, List Member, NZ First on 22 May.
- I attended the meeting of the Te Tai o Poutini Committee on 28 May.
- The Chief Executive and I met with Lou Sanson, Director General of DoC, and Mark Davies, Director of DoC, on Thursday 28 May.
- I attended the launch of Predator Free 2050 at Te Kinga on 29 May.

I attended to various constituency matters, and took a number of phone calls during the reporting period.

RECOMMENDATION

That this report be received.

Allan Birchfield
Chairman

6.0**THE WEST COAST REGIONAL COUNCIL**

Prepared for: Council Meeting – 9 June 2020
Prepared by: Michael Meehan – Chief Executive
Date: 2 June 2020
Subject: **CHIEF EXECUTIVE'S REPORT**

Meetings Attended:

- I attended the Mayors, Chairs and Iwi forum on 20 May.
- I met with the Chief Executive of Development West Coast on 20 May.
- I participated in weekly meetings with MfE and other government agencies during the reporting period.
- I took part in a CDEM workshop to discuss the CDEM Group network of deployable multi-purpose habitation on 26 May.
- I met with Lou Sanson, Director General of DoC, and Mark Davies, Director of DoC, on Thursday 28 May.
- I attended the launch of the Predator Free 2050 Programme at Te Kinga on 29 May.

Health and Safety Audit

Recently an external three day health and safety audit was completed on site. This audit is required to meet the AS/NZ Standard ISO 45001 Occupational Health and Safety Management Systems.

During the audit process the auditor reviewed the Council Health and Safety system and completed three off site visits. The auditor met with the Health and Safety Chair along with a number of one on one meetings with staff.

The results of this audit will be presented to the next Council meeting, moving into the future elected members will be presented with regular Health and Safety reports as part of the CEO report to the Council meeting.

Covid- 19

I attended various meetings with multiple agencies during the reporting period.

RECOMMENDATION

That this report be received.

Michael Meehan
Chief Executive

THE WEST COAST REGIONAL COUNCIL

To: Chairperson
West Coast Regional Council

I move that the public be excluded from the following parts of the proceedings of this meeting, namely, -

Agenda Item No. 8.

- | | | |
|---------|-----|--|
| 13 - 17 | 8.1 | Confirmation of Confidential Minutes 14 May 2020 |
| 18 – 19 | 8.2 | Insurance Claim 26 March 2019 Flood Event |
| | 8.3 | Response to Presentation (if any) |
| | 8.4 | In Committee Items to be Released to Media |

Item No.	General Subject of each matter to be considered	Reason for passing this resolution in relation to each matter	Ground(s) under section 7 of LGOIMA for the passing of this resolution.
8.			
8.1	Confirmation of Confidential Minutes 14 May 2020		Clause 7 subclause 2 (a)
8.2	Insurance Claim 26 March 2019 Flood Event		Clause 7 subclause 2 (a)
8.3	Response to Presentation (if any)		Clause 7 subclause 2 (i)
8.4	In Committee Items to be Released to Media		Clause 7 subclause 2 (i)

I also move that:

- Michael Meehan
- Robert Mallinson
- Randal Beal
- Hadley Mills
- Heather McKay
- Nichola Costley

be permitted to remain at this meeting after the public has been excluded, because of their knowledge on the subject. This knowledge, which will be of assistance in relation to the matter to be discussed.

The Minutes Clerk also be permitted to remain at the meeting.