

1 Summary

- 1.1 Over the last winter the national standards were exceeded twice for 24 hour average particulate matter smaller than 10 microns (PM₁₀). This is the best result on record since air quality monitoring began in Richmond in 2001 and much lower than the total number of exceedences recorded during 2013 (9). The maximum 24-hour concentration recorded was 58 µg/m³, the lowest annual maximum on record.
- 1.2 The overall trend in PM10 concentrations over the ten years of continuous record, is for improving (declining PM10). Median concentrations this winter were the lowest equal on record. This is likely to be partially due to the higher than average temperatures during early winter (May-June) and higher than average wind run during the July period, which tend to reduce smoke generation and blow it away.
- 1.3 The results may also be partly due to additional compliance effort during the winter of 2013 and 2014 which included following up “objectionable and offensive discharges beyond the property boundary and checking properties where solid fuel burners are no longer legally able to be used. Trends at Nelson’s St Vincent St monitor (Airshed A) also show an unusually good year. While overall there has been a more dramatic improvement in air quality in Nelson over the past ten years, Nelson started with a greater number of exceedences and both now have a similar number.
- 1.4 Monitoring undertaken in Motueka during the mid winter period did not record any breaches or near breaches of the national standard.

2 Draft Resolution

That the Environment and Planning Committee:

- 1) **Receives the 2014 Air Quality Report REP14-11-04;**

3 Purpose of the Report

3.1 To update Council on results from air quality monitoring in Richmond and Motueka during the winter of 2014 with regard to the requirements of the Resource Management (National Environmental Standards for Air Quality) Regulations 2004 (NES).

4 Background and Discussion

4.1 The NES requires that Tasman District Council achieves no more than three breaches of the standard for PM₁₀ (mainly smoke) per year by 2016 and no more than one breach by 2020. In order to achieve this requirement Tasman District Council regulates the use of solid fuel burners and outside burning through its Resource Management and Building Act requirements. It also undertakes education (good wood and good burner operation) and uses enforcement action (illegal and objectionable discharges) where necessary.

4.2 Over the last winter the NES for PM₁₀ was exceeded twice. An exceedence occurs when the concentration of smoke (PM₁₀) is greater than 50 micrograms per cubic metre (50 µg/m) when averaged over a 24 hour period. The 2014 monitoring result of two exceedences in Richmond is the best result since monitoring commenced and a quarter of the number of exceedences recorded last year (2013) when 9 exceedences occurred. The maximum PM₁₀ concentration for 2014 was 58 µg/m³ and the second highest PM₁₀ concentration (used because by 2020 one exceedence is still allowed) was 54 µg/m³. The highest and second highest concentrations are the lowest on record since monitoring began in 2000 showing a consistent trend of improvement. Results for the last 14 years are shown in Figure 1 below.

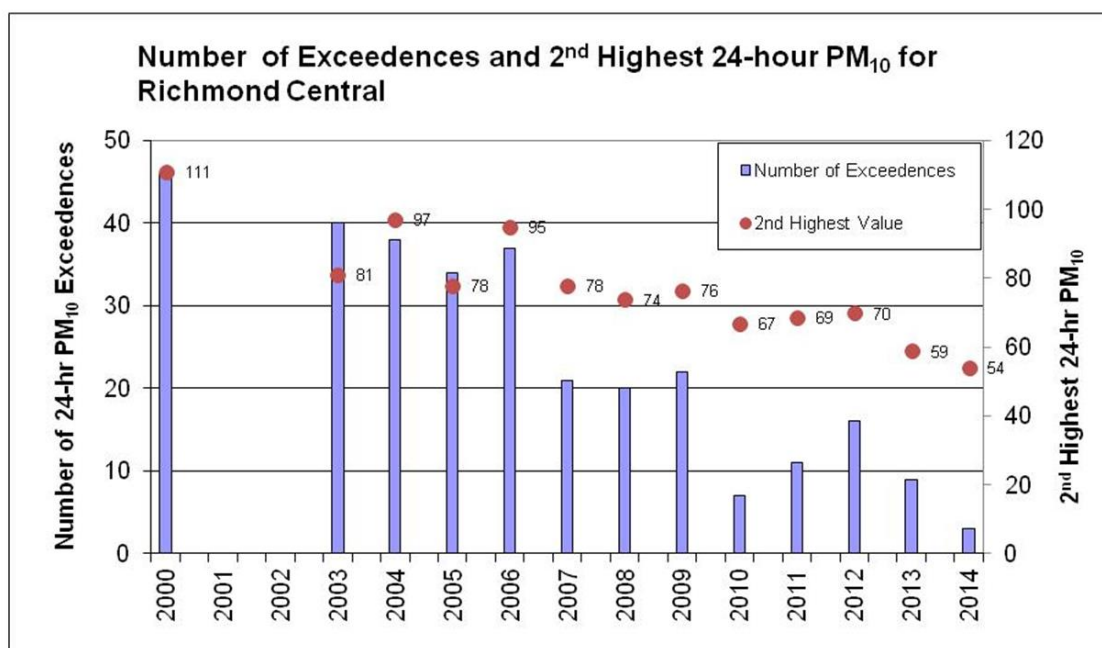


Figure 1: Total number of NES exceedences per year and second highest PM₁₀ concentration per year

4.3

4.4 Richmond and Nelson City are both part of a wider regional airshed. They are both subject to similar climatic influences, to similar smoke sources and to leakage between the airsheds. Comparable records exist for the two areas for the past 11 years (between 2003 and 2014). During 2003 Richmond Airshed had 40 exceedences of the NES while Nelson A Airshed had 68. By 2013 Richmond had dropped to 9 exceedences while Nelson A had also dropped to 9 exceedences. Over this past year (2014) Richmond had 2 exceedences while Nelson A also had 2 exceedences (See Figure 2 below).

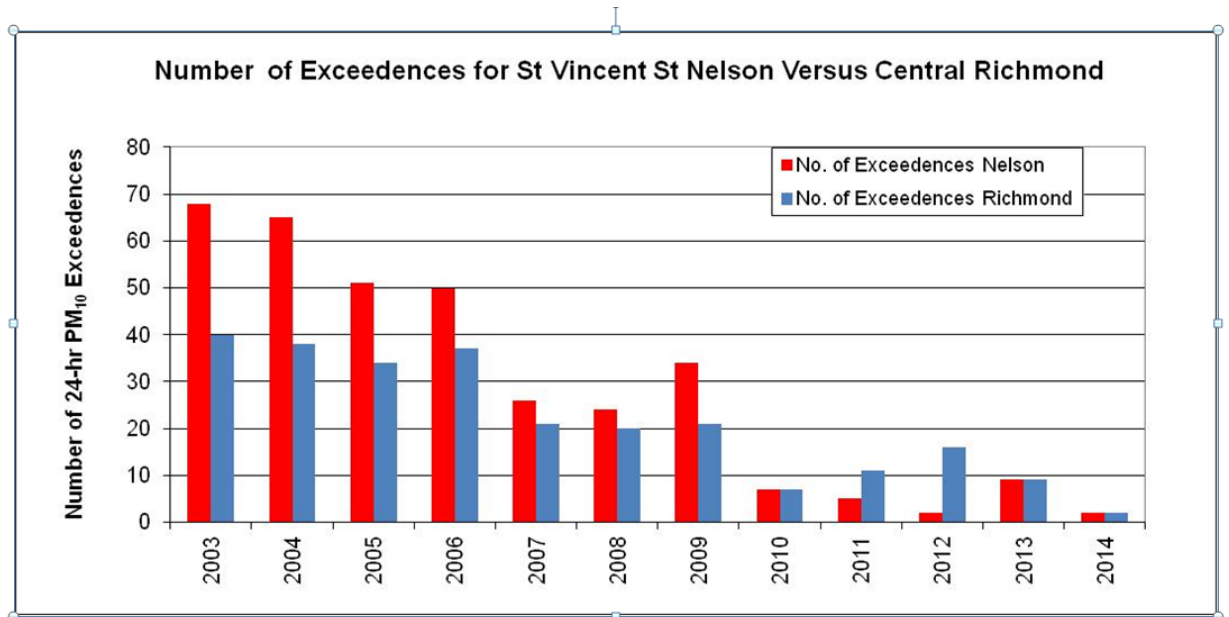


Figure 2: Comparative number of exceedences Richmond and Nelson Airshed A

4.5

4.6 The ground level PM₁₀ concentration recorded by the monitoring equipment are influenced by a number of factors including the concentration of smoke and other small particles emitted into the air due to combustion activities such household solid fuel heaters, vehicles and industry; the concentration of small particles present from natural sources such as dust, sea salt, and pollen; and the amount of turbulent mixing and removal as a result of wind, rain and weather.

4.7 Weather conditions influence smoke concentrations by encouraging greater home heating discharges (cold weather), mixing or trapping discharges through variations in wind speed and/or vertical stability and removal of smoke particles in water droplets during rain. The NES does not concern itself about why an exceedence occurs, only that it occurred. However for Council to manage air quality effectively, it needs to understand how the differing influences relate to each other so that any interventions to improve air quality are well targeted and effective.

4.8 Based on the meteorological record from the TDC Queen St meteorological monitoring site the early winter of 2014 (May and June) was much warmer than average and warmer than 2013. No NES breaches of the NES occurred during May and during June only one breach occurred. In comparison during the 2013 winter one exceedence occurred in May and six during June.

4.9 During July 2014 air temperatures dropped but were still slightly above average. Wind speed increased to slightly above average and only one exceedence of the NES was

recorded. By comparison during 2013 2 exceednces were recorded. There were no NES exceedences during August 2014 although August exceedences are rare in the record.

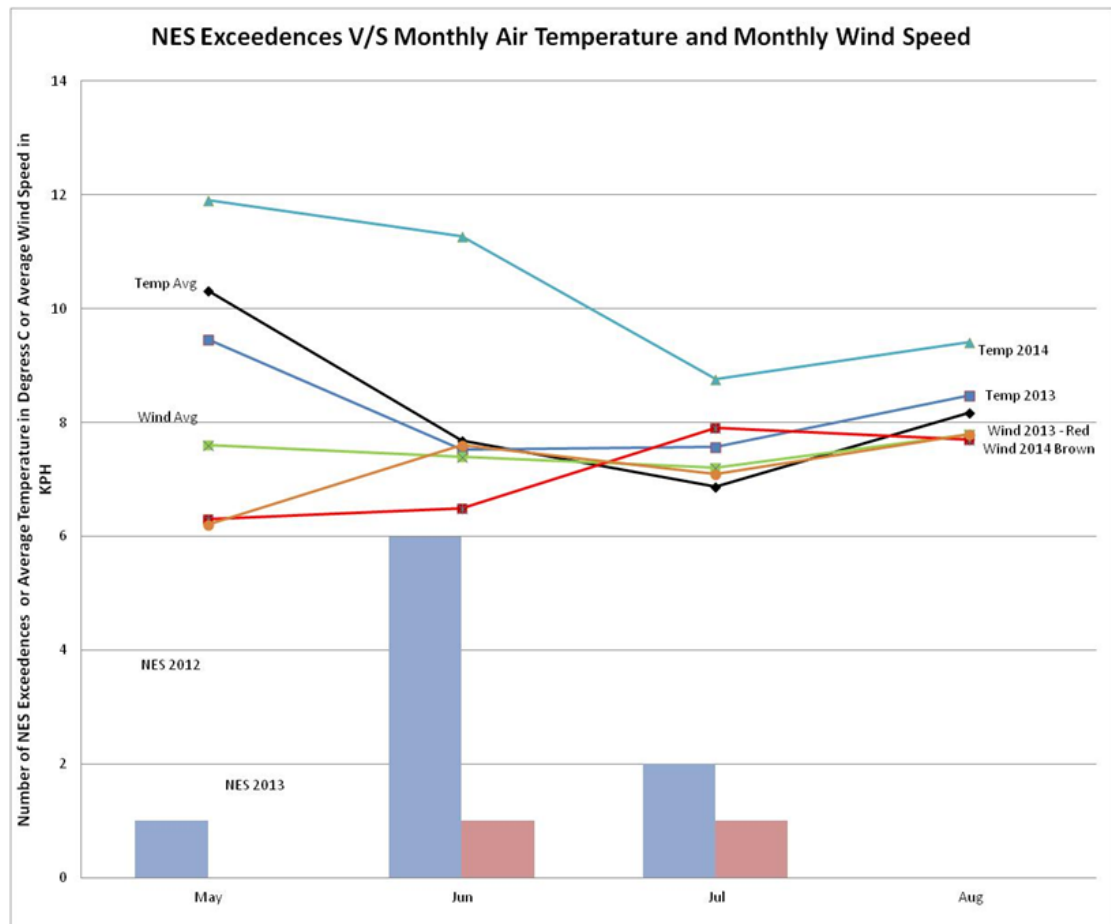


Figure 3: Comparison of NES exceedences against air temperature and wind speed

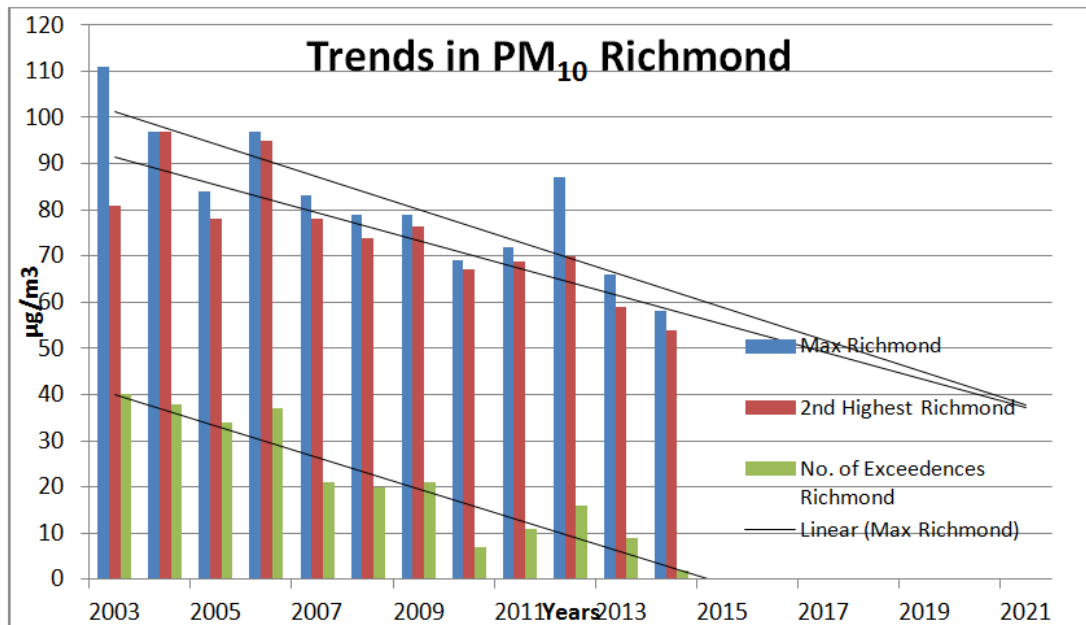
4.10

4.11 When a linear trend line is fitted to the number of PM₁₀ exceedences recorded each year since 2000 and that trend is then extrapolated out to 2020, it suggests that with the current rate of air quality improvement the requirement of the NES (no more than one breach breaches per year by 2020) should be met during 2015 (See Figure 4 below). However this projection should be treated with caution due to the weather influences discussed above.

4.12 When the maximum recorded PM₁₀ concentrations fall in and around the maximum permissible NES concentration of 50 µg/m³ then a very small change in PM₁₀ concentrations can result in air quality either meeting (below 50 µg/m³) or breaching (above 50 µg/m³) the standard. Therefore minor differences in weather patterns or in emissions resulting in minor changes to PM₁₀ concentrations can lead to significant changes in the number of exceedences. This means projections based on the number of exceedences can potentially be inaccurate.

4.13 Instead of using projections based on the number of exceedences it is common practice to project on the second highest PM₁₀ concentration for the year (99.7% value). The second highest value is chosen as the NES allows for one breach per year after 2020 and because sometimes the highest value can be an outlier and can skew

the projection. The projection based on current trends of the second highest value suggests that the requirements of the NES should be met during 2015 (max 50 $\mu\text{g}/\text{m}^3$ or lower). Projection based on the maximum values also gives a very similar result with the NES being met in 2017 (see Figure 4 below) however the unusual weather conditions experienced during 2014 suggest that the number of exceedences during a more normal year would be higher.



4.14 Figure 4: Trends in Richmond air quality projected to 2020

- 4.15 A PM₁₀ monitor was operated in the north western part of Motueka during the winter of 2014. The maximum recorded concentration was 35 $\mu\text{g}/\text{m}^3$ which is well below the maximum permissible standard of the NES. The results are shown in Figure 4 below.
- 4.16 While this is an excellent result and consistent with previous monitoring undertaken in Motueka it should be interpreted with some caution due to the unusual meteorological conditions experienced during the winter of 2014 as discussed above.

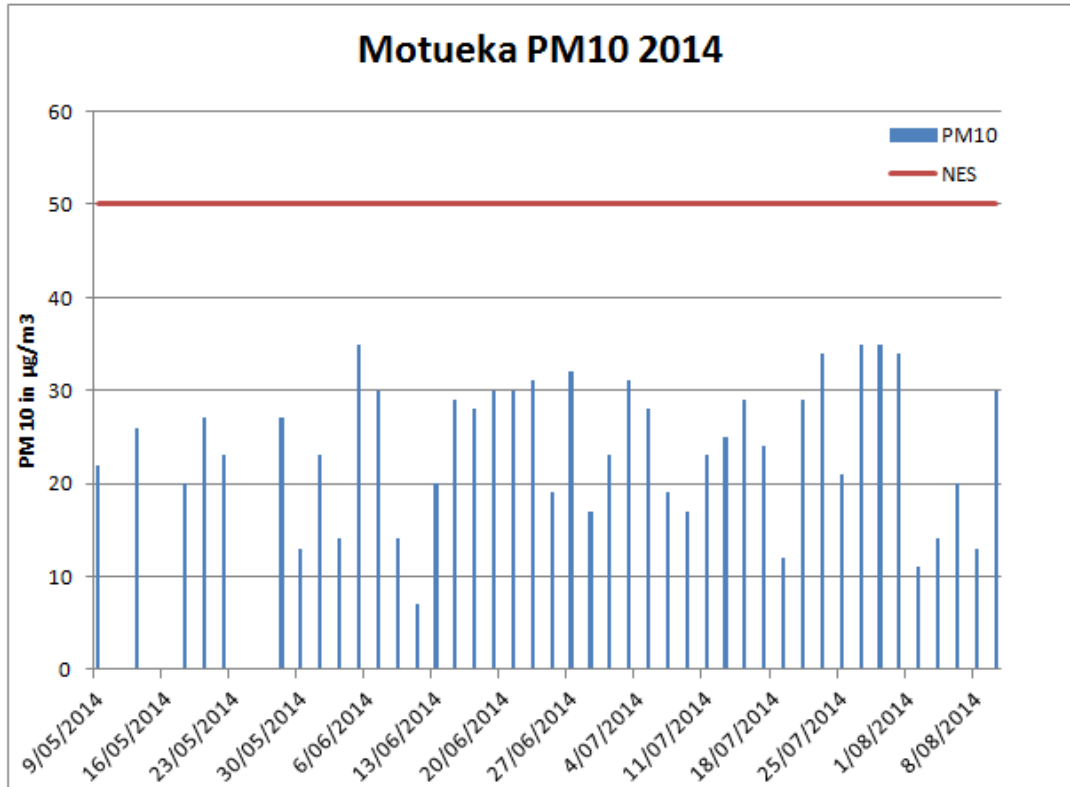


Figure 4: Motueka PM₁₀ air quality 2014

4.17

5 Options

- 5.1 The National Environmental Standard for PM₁₀ along with its achievement date of 2020 is set by law and Tasman District Council is required to meet it. Based on the best information available to it, Council has developed rules to manage air quality. Air quality monitoring to date suggests that the current rules should achieve the necessary improvement in air quality by 2020 provided they are accompanied by sufficient education and where necessary enforcement action.
- 5.2 While the Council could chose to either relax or tighten the current rules any relaxation is likely to mean that the requirements of the NES will not be met and any tightening is likely to increase costs for homeowners and/or the Council. The current balance appears to be working.

6 Strategic Challenges / Risks

- 7 Three main risks exist. Firstly the current trends of improving air quality rely on the TRMP rules being complied with. Experience over the past few winters suggest that if education and enforcement is not ongoing many owners/occupiers may fail to comply.
- 7.1 Secondly the current trend in part relies on replacement of older wood burners as houses change owners. If market conditions reduce the number of property sales then the rate of air quality improvement could slow down.

- 7.2 Thirdly even after 2020 a particularly cold and/or still winter could lead to higher PM₁₀ concentrations. In that situation there could still be NES exceedences. Exceedences will impact on the business community through Council's ability to issue discharge permits.

8 Policy / Legal Requirements / Plan

- 8.1 The current TRMP rules related to discharges from small scale solid fuel burning appliances strike a balance between achieving the requirements of the NES and the cost involved. Any increased stringency of rules such as requiring faster phase out of older wood burners will increase the costs. That additional cost will need to be met by either the landowner, Council or by Central Government. There currently does not appear to be a justification to change these rules.

9 Consideration of Financial or Budgetary Implications

- 9.1 There is no additional budgetary requirement proposed however it should be noted that the current improvements in air quality are likely to be dependent on the current budgets for air quality monitoring and for education/enforcement of TRMP rules being maintained.

10 Significance and Consultation

- 10.1 This is not significant as no decisions to change TRMP rules are required.
10.2 There is no consultation required as no changes are proposed.

11 Conclusion

- 11.1 Based on current trends PM₁₀ (smoke) air quality in Richmond should meet the requirements of the National Environmental Standard by 2020 provided that the current levels of education and enforcement are maintained.
11.2 The monitoring results from Motueka meet the NES but should be interpreted with caution due to the mild winter.

12 Next Steps / Timeline

- 12.1 <Enter text>