

Report No:	
File No:	C301
Date:	14 October 2013
<b>Information Only - no decision required</b>	

## REPORT SUMMARY

**Report to:** Environment & Planning Committee  
**Meeting Date:** November, 2013  
**Report Author:** Paul Sheldon, Resource Scientist  
**Subject:** Air Quality in Richmond - An Update 2013

### EXECUTIVE SUMMARY

Over the last winter the national standards were exceeded nine times for 24-hour average particulate matter smaller than 10 microns (PM<sub>10</sub>). This is just over half the total number of exceedences for 2012 (16), although slightly worse than the 7 exceedences recorded in 2010. The maximum 24-hour concentration was 66 µg/m<sup>3</sup> which was the lowest annual maximum on record.

The overall real trend in PM<sub>10</sub> concentrations over the ten years of continuous record, is improving (declining PM<sub>10</sub>), median concentrations this winter were the second lowest on record. This may be in part due to additional compliance effort during the winter of 2013, including following up “objectionable and offensive discharges beyond the property boundary and on properties where solid fuel burners are no longer legally able to be used. Trends at Nelson’s St Vincent St monitor show a much more dramatic improvement in air quality over the past ten years than Richmond and this however Nelson started with a greater number of exceedences.

### RECOMMENDATION/S

That the report be received.

### DRAFT RESOLUTION

**THAT the Environment & Planning Committee receives the Air Quality in Richmond - an Update 2012 - Report REP12-09-04.**

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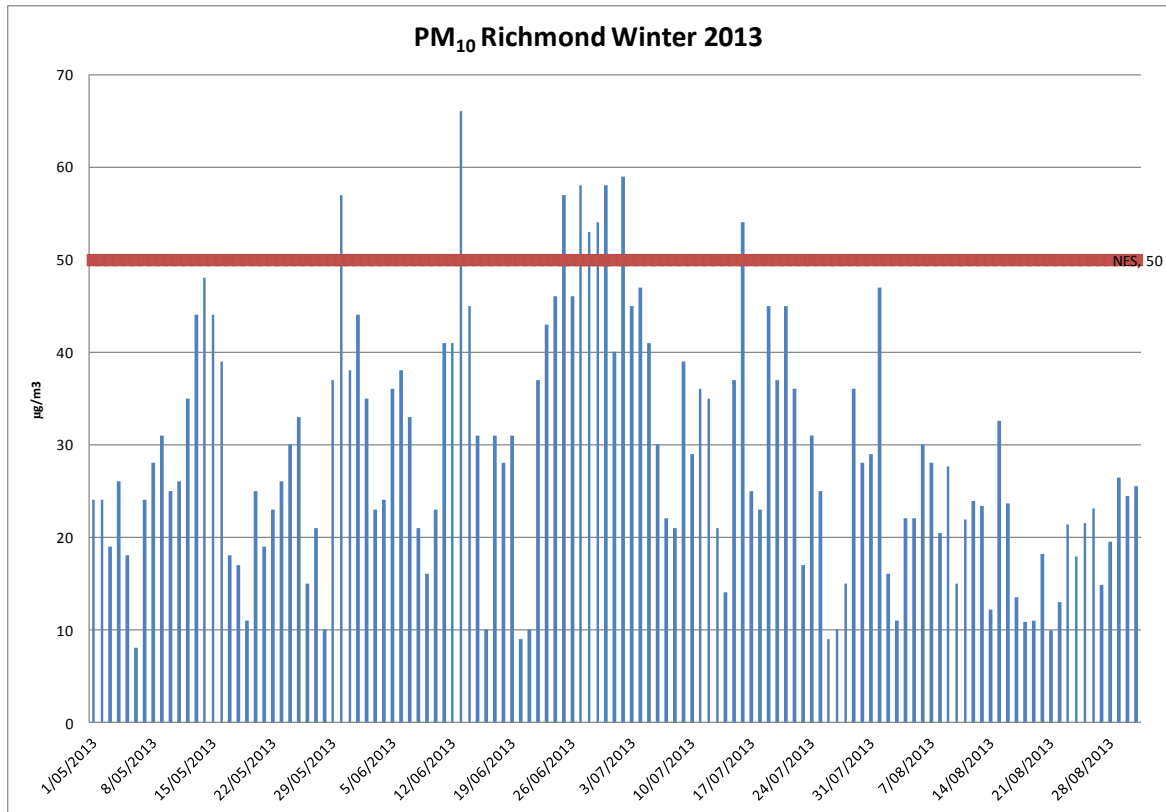
**Report to:** Environment & Planning Committee  
**Meeting Date:** Thursday, 20 September, 2013  
**Report Author:** Paul Sheldon, Resource Scientist  
**Subject:** Air Quality in Richmond - An Update 2012

## 1. Purpose

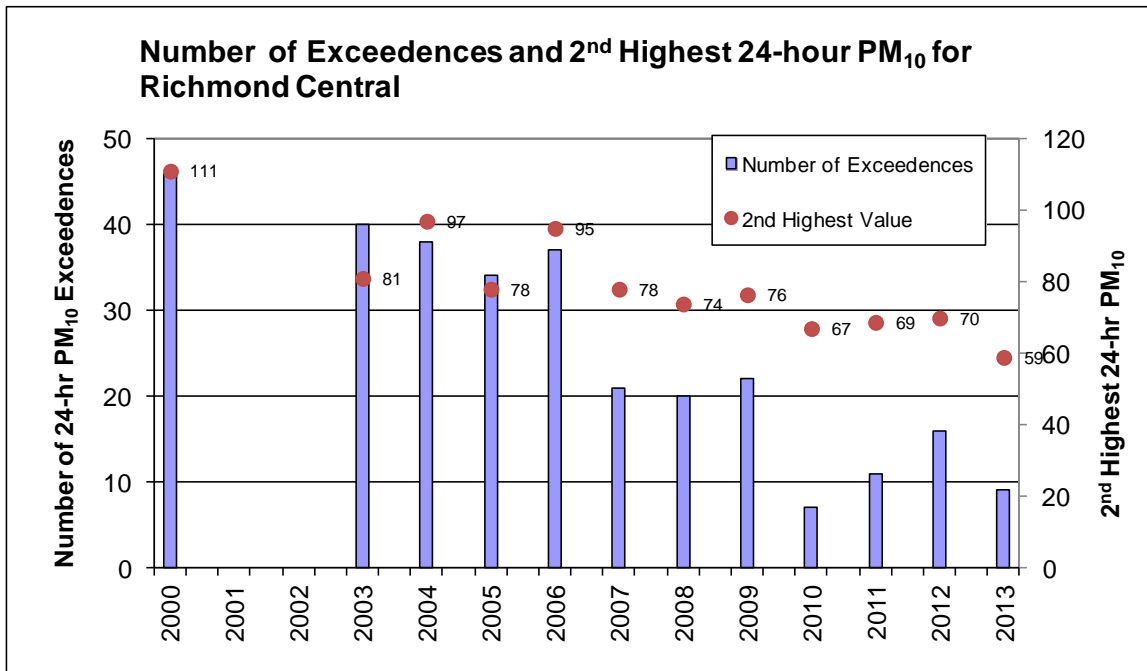
1.1 The purpose of this report is to present results for air quality monitoring in Richmond for the 2013 year-to-date and compare these results to previous years.

## 2. Results from Richmond Central Site

- 2.1 At the Richmond Central site there were nine measured exceedences of the National Environmental Standard (NES) for air quality for 24-hour average PM<sub>10</sub> this last winter (see Figure 1 & 2). Figure 1 shows a plot of 24-hour average PM<sub>10</sub> for the year to date. The maximum concentration this winter was 66 µg/m<sup>3</sup> recorded on the 13<sup>th</sup> of June. The number of exceedences and concentrations of PM<sub>10</sub> in Richmond this winter were lower than last winter and more consist with the downward trend of previous years.
- 2.2 Poor air quality generally coincides with periods of colder, calm weather. The winter began early with lower than normal temperature and lighter winds Significant cold snaps were experienced in late May, and through several episodes in June as well as early July (Figure 5). This year there were no exceedences of the standard after July 22, unlike last year after this time when there were five exceedences, with the last one being on 23 August. The monthly average temperature at Nelson Airport this August was the warmest on record (10°C).
- 2.3 The mean PM<sub>10</sub> 24-hour average for days when there was an exceedence was 61.3, which is very consistent with the mean over the past five years. This analysis includes only those days when there was an exceedence.
- 2.4 A representation of the spread of the data is shown in Figure 4 with data grouped into the following categories: good, acceptable, alert and exceeding the NES limit (from Ministry for the Environment). This data is presented for the whole year and shows a very similar pattern to last year apart from a greater percent of NES exceedences.

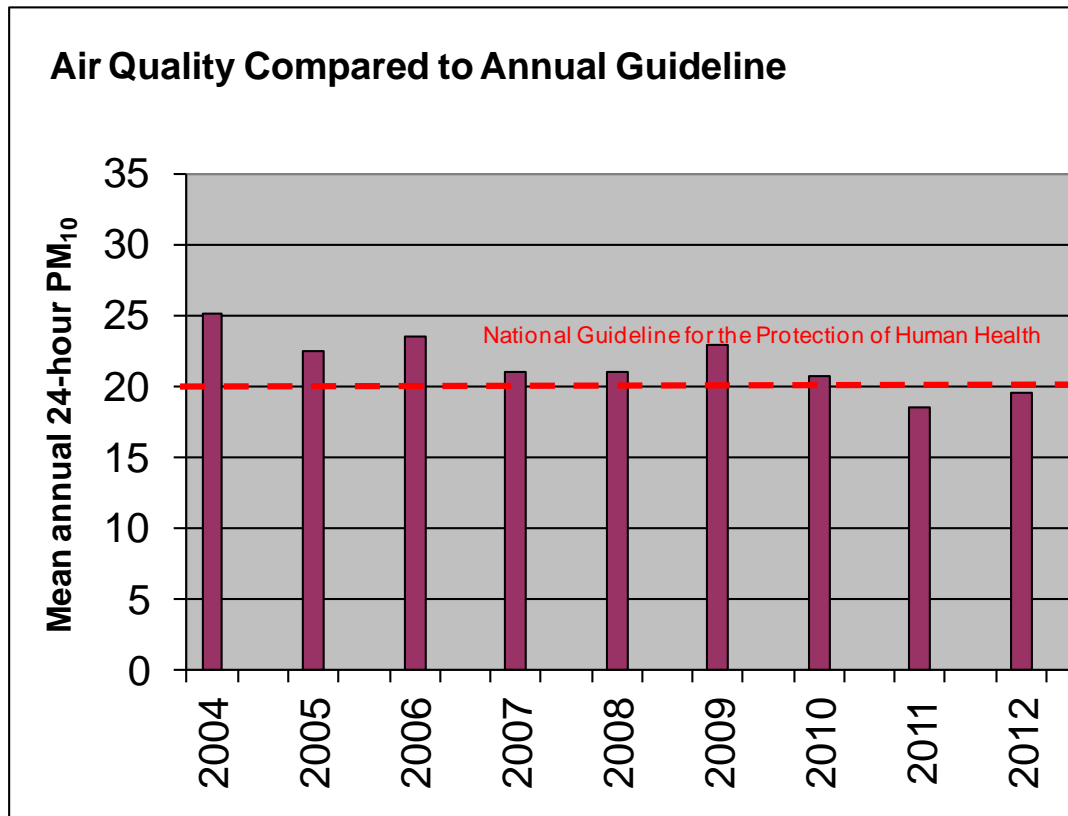


**Figure 1:** PM<sub>10</sub> 24-hour Average for Richmond Central - May-August 2013. Red line shows the National Environment Standard. (Data from BAM and adjusted by 16%, as per Wilton et al 2007).

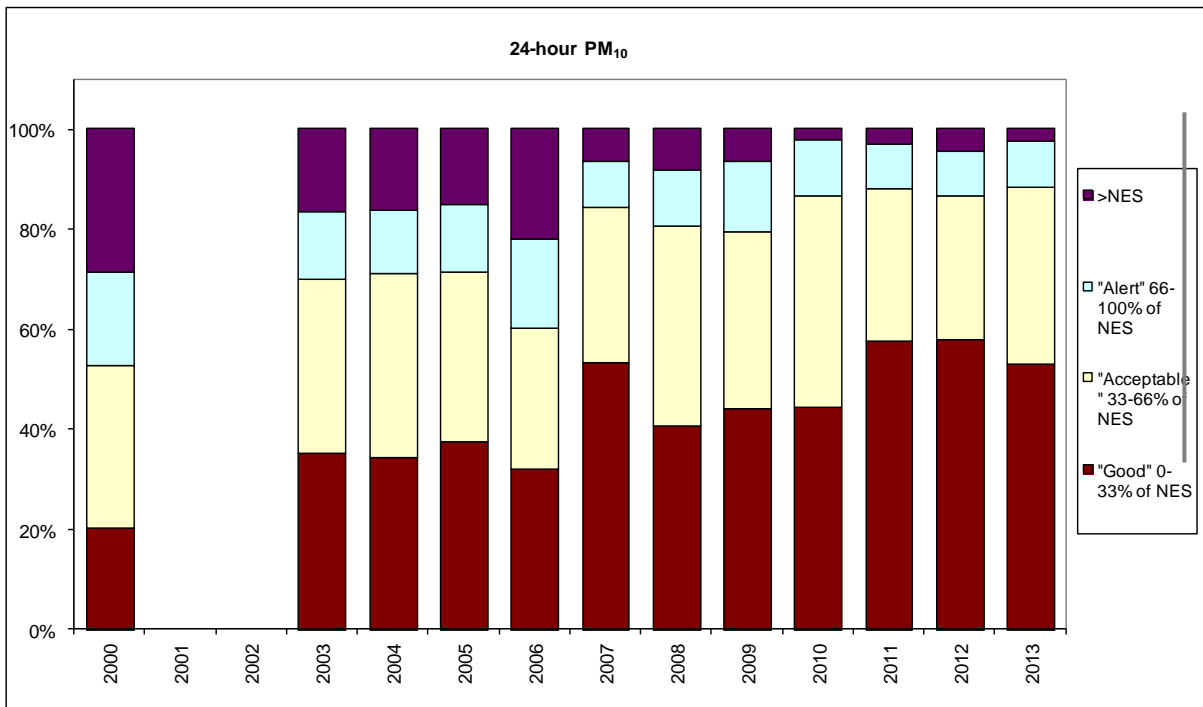


**Figure 1:** Total number of days per year that the NES was exceeded and second-highest exceedence (Note: no monitoring occurred in 2001-02).

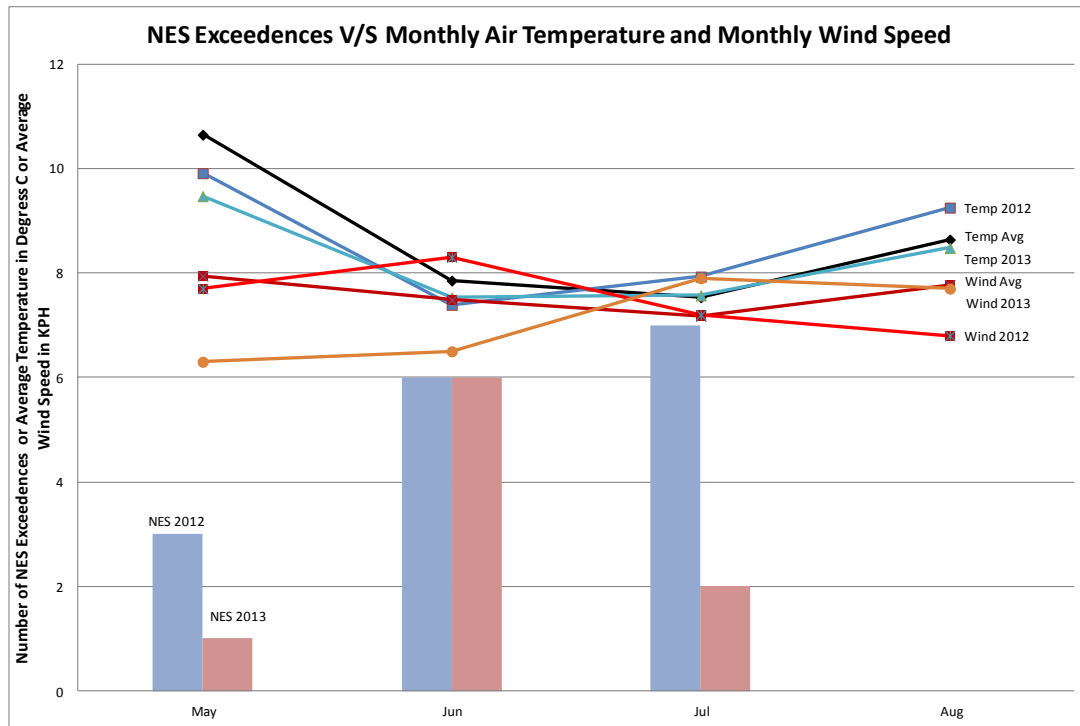
2.5 The **annual average** 24-hour average concentration for 2012 was 19  $\mu\text{g}/\text{m}^3$ . Which was the same as last year and below the national guideline of 20  $\mu\text{g}/\text{m}^3$  (see Figure 3). Over the last nine years of record, there appears to be a slight downward trend in this annual average. Note that annual averages are not part of the national standard for assessing  $\text{PM}_{10}$ .



**Figure 3:** Annual (year-round) daily average PM<sub>10</sub> concentration (2004-2012)



**Figure 4:** Ministry for the Environment indicator graphs (>NES = percent of samples breaching the National Environmental Standard for Air Quality).



**Figure 4:** Comparison of PM<sub>10</sub> Exceedences during 2012 and 2013 against monthly average wind speed and temperature. Meteorological data from Tasman District Council office met station.

### True Trends in PM<sub>10</sub> over Time

2.6 Because of the variability of air quality from year to year due to different meteorological conditions, it is important to assess trends only for particular periods when the critical meteorological factors are similar. The most critical factors related to air pollution is wind speed (worst air quality generally occurs

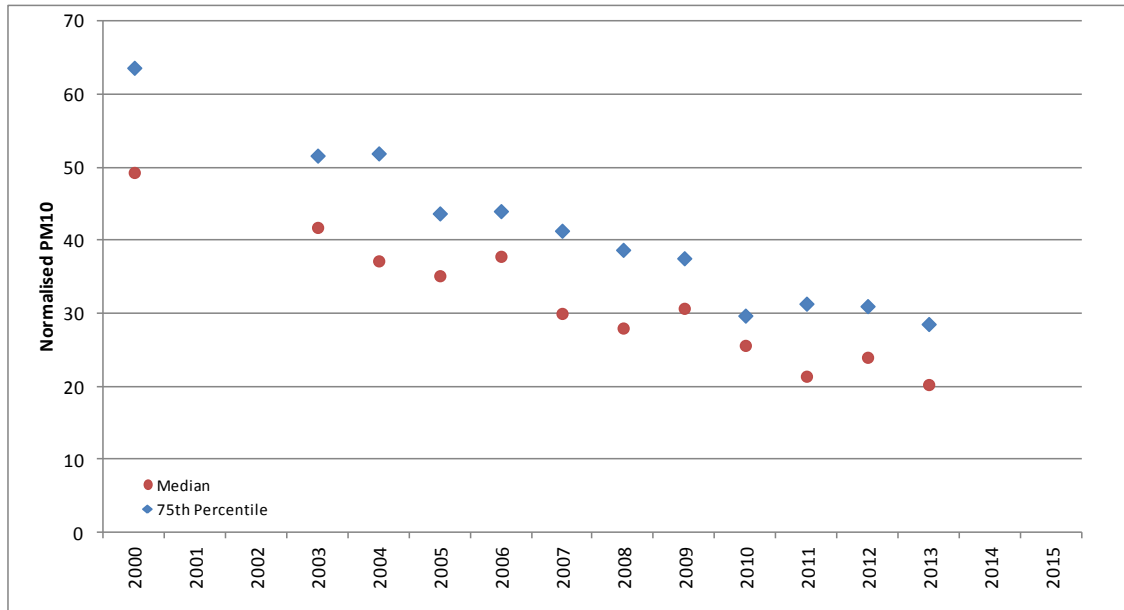
with wind speeds below 3.8m/sec) and air temperature (8.00 pm to midnight)<sup>1</sup>. True (normalised) trends have been determined by adjusting PM<sub>10</sub> data in a particular pollution-potential meteorological range by the difference between the average PM<sub>10</sub> concentration for that range and the average PM<sub>10</sub> in the baseline for that range. This adjusted PM<sub>10</sub> data is presented as the median (middle number) and 75<sup>th</sup> percentile (the value below which 75% of the data falls) for each winter (May-August inclusive).

2.7 When plotted over the years of monitoring, median normalised PM<sub>10</sub> concentrations show a general downward trend except for this winter which was 12% up on last year (Figure 6). The 75<sup>th</sup> percentile normalised PM<sub>10</sub> concentration was similar to last year and only 4% above that in 2010.

2.8 PM<sub>10</sub> concentrations are predicted to continue to fall at a similar rate until 2014 when the rate of fall will ease and is likely to almost 'flat-line' after 2016 and not

<sup>1</sup> Wilton, E; Rijkenberg, M; Bluett, J: Assessing long-term trends in PM<sub>10</sub> emissions and concentrations in Richmond, 2009. NIWA Client report 2010-015.

go below the AQNES in 2020. This is based on data up to August 2011. This information is similar to previous predictions.

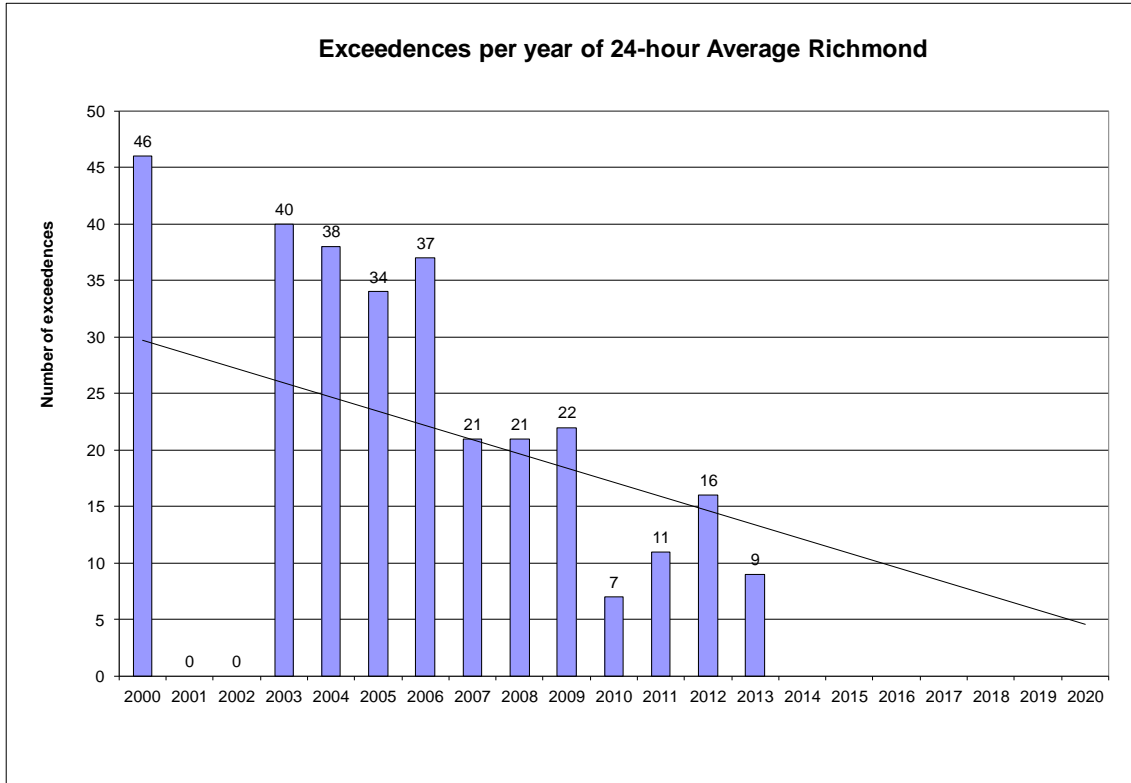


**Figure 3:** Trends in PM<sub>10</sub> metrics (median and 75<sup>th</sup> percentile) across the monitoring record for days of similar meteorological conditions.

### Deviations from the National Standard Straight Line Path for Richmond

- 2.7 The revised national standard for air quality<sup>2</sup> requires that there are no more than three exceedences in any year from 31 August 2016, and from 31 August 2020 onwards there can only be a maximum of one exceedence per year.
- 2.8 The fourth-highest value is plotted on Figure 7 in respect of this standard because the NES allows for three breaches each year in 2016. For the Richmond Central site all results were below the straight line path (the solid line shown in Figure 7). It now seems likely that we would not have met the 2013 compliance date set by the previous NES (the dashed line in Figure 7).

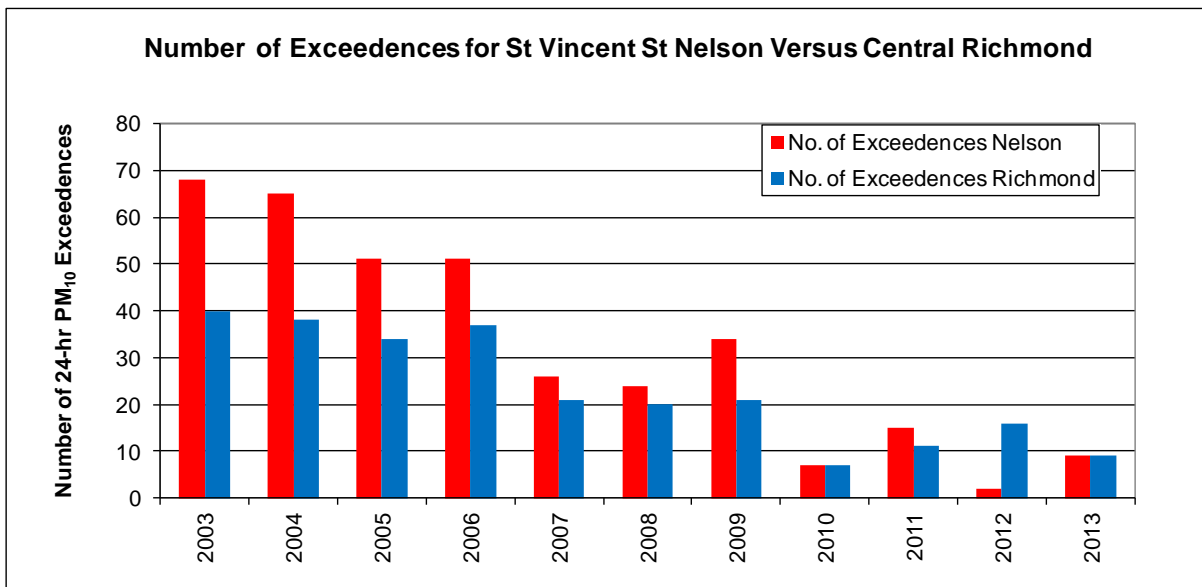
<sup>2</sup> Resource Management (National Environmental Standards for Air Quality) Regulations 2004 (SR 2004/309) (as at 1 June 2011)



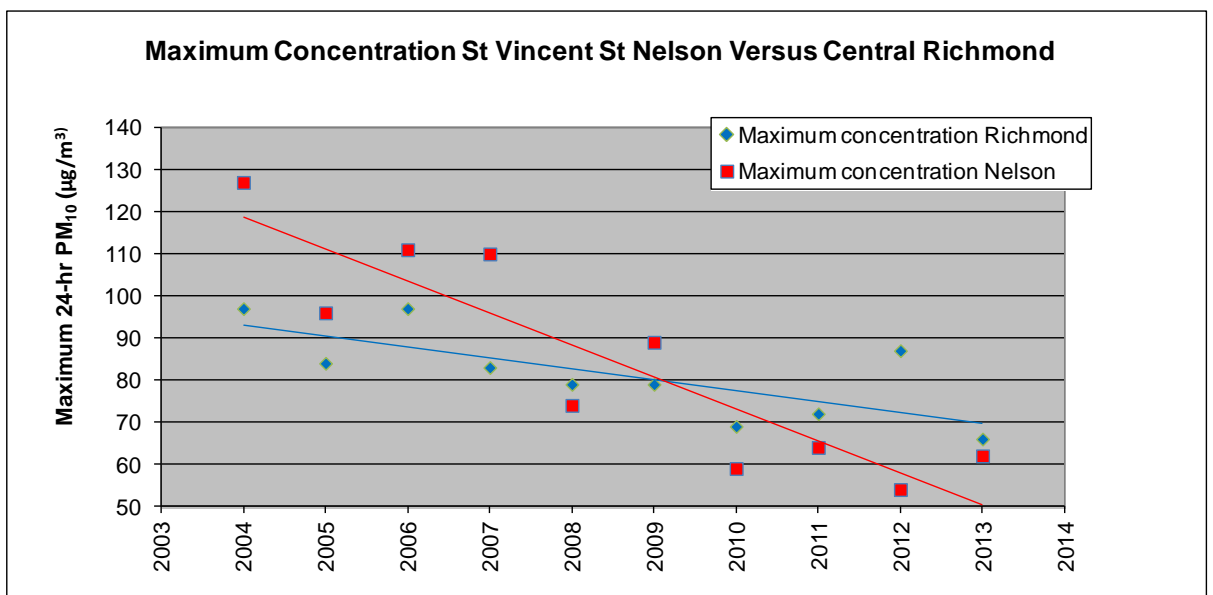
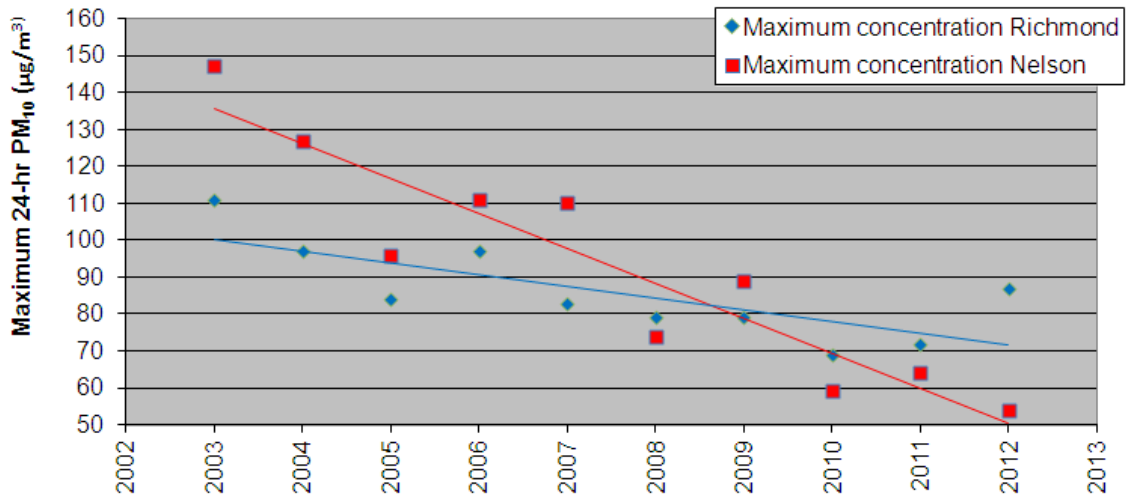
**Figure 5:** Trend in NES Exceedences with Trend Projected to 2020.



2.9 Over the past few winters prior to this winter trends for Richmond have been similar to Nelson, but this winter Nelson has improved dramatically with only two exceedences at the St Vincent St monitoring site and a maximum concentration of 54  $\mu\text{g}/\text{m}^3$  (Figure 8a and b). The meteorological conditions at this Nelson site follow a relatively similar pattern to Richmond's. The improvement in Nelson City is likely to reflect the relatively high level of investment Nelson City Council has put into education and subsidies for replacement compliant home heating, as well as compliance and enforcement.



**Figure 2:** Number of Exceedences of 24-hour  $\text{PM}_{10}$  for Richmond (Blue) Compared to Nelson (Red) from 2003-2012.



**Figure 8b:** Maximum concentrations of 24-hour PM<sub>10</sub> for Richmond (blue) compared to Nelson (red) from 2003-2012.

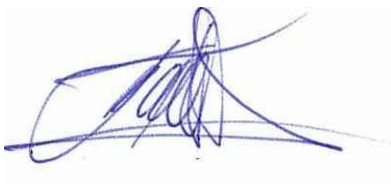
### **3. Actions to Improve Air Quality in Richmond**

- 3.1 A full report by the compliance monitoring team about achieving compliance with Tasman Resource Management Plan rules for emissions from domestic home-heating burners is not available at this time. However, a number of surveys and communications have been undertaken this winter.
- 3.2 Staff undertook several late-evening visual surveys of domestic home emissions and assessed them as whether there was “objectionable or offensive smoke” moving beyond the property boundary (TRMP 36.3.2.2(e)). The surveys were carried in the later evening to ensure that start-up emissions were not included as this is usually short-term and unlikely to contribute greatly to air pollution. Some of the worst emissions tracked for over 200m beyond the property boundary.
- 3.3 Eighty-five property owners and tenants (where the property was rented) were found to have an excessive smoke discharge from their woodburner. Letters were sent to each property owner and tenant advising them of the issue and providing them with a Good Practice Guide for Operating Woodburners. As follow-up to the letters, compliance officer, Helen Dempster, spoke with dozens of the recipients of these letters to try and identify what they may be doing to cause all the smoke, and common themes were dampening down the fire, not regularly cleaning the chimney, burning damp wood or smothering the fire with too much wood.
- 3.4 While the exact statistics are not available, it is conservatively estimated that over 75% of those 85 properties have not sold since 13 January 2007 and therefore they can lawfully continue to use often very old burners. Only three of those properties were using burners that were believed to be non-compliant with rule 36.3.7.5, i.e. the property had sold since 13/1/07, and therefore any burner must be a compliant model. In respect to the latter, where the Council did not hold sufficient information about the burner to prove its compliance status, the owners were advised to prove to Council that the burners were compliant by a specified date. Where this proof is not forthcoming and the burner use continues, the Council would need to take enforcement action as necessary. With the vast majority of problem emissions being from burners that are compliant with rule 36.3.7.5, it appears that Council will have to rely much more on enforcing compliance with the rule relating to “offensive or objectionable” emissions. It is the opinion of officers that the 85 emissions that were recorded as being “offensive or objectionable” this winter were causing the majority of visual air pollution in Richmond and likely to be the cause of a large proportion of the high PM<sub>10</sub> concentrations in Richmond.
- 3.5 In order to meet compliance with the NES, it is critical that we continue to make progress with the compliance programme.

3.6 It was announced recently that there is an additional “clean air grant” available for replacement of 30 non-complying burners in homes in Richmond. It is suggested that an invitation be extended to the 82 owners of homes which had significant emissions and who were not caught by the house sale rule (rule 36.3.7.5) to apply for this funding and to come to a meeting to discuss the issue. The meeting may be a chance to get their ideas for how we can tackle the problem without needing so much enforcement effort.”

#### 4. Draft Resolution

**THAT the Environment & Planning Committee receives the report entitled Air Quality in Richmond - An Update 2012 - Report REP12-09-04.**



Trevor James  
**Resource Scientist**

Hours spent doing airshed work in 2012 (for Helen D): 305

Hours spent doing airshed work in 2013 (for Helen D): 542

#### Stats for 2013:

Things like number of properties visited re point of sale rule: 1161

Action taken re point of sale: Generic letter sent to property owners that explains the rule re wood burner use and notes that their property is now subject to the rule.

Number of properties visited found to have objectionable discharge: 174 (in 2012, 86 properties)

Action taken over objectionable discharge: In the first instance, a letter is sent to the owner/tenant advising them of the objectionable discharge, the TRMP rules, potential causes for such a discharge and measures to avoid such discharges, as well as a copy of the Council's 'Good Practice Guide for Operating Wood burners'. Where a second offensive discharge was found occurring, the owner/tenant got a formal written warning (13 properties got a formal written warning this year). Had there been a third occurrence, they would have got an infringement notice, but none were found offending a third time this year.

33 properties were found to be using a 'non-compliant' wood burner (i.e. the property had sold since 13/1/07 and so only NES-compliant wood burners are allowed to be used on those properties). Each of these properties have been issued abatement notices requiring that they permanently cap the chimney/flue. A number of these properties have opted to upgrade to a NES-compliant wood burner rather than cap the chimney/flue. All except 1 of the 33 properties (there's always one!!!) have either capped the chimney, or removed or replaced the offending wood burner. That one, is going to get a fine.

In May 2013, 1351 letters were sent (pro actively) to households within the airshed that were known to have either NES-compliant wood burners or had wood burners and were not yet subject to the TRMP rule (i.e. the latter were allowed to continue to use their wood burner even if it was not NES-compliant). These letters advocated good practice re wood supply/storage and wood burner use.

The number of hours (approx, conservative) spent 'in the field' looking for objectionable smoke discharges and use of non-compliant burners in breach of TDC rules: 41