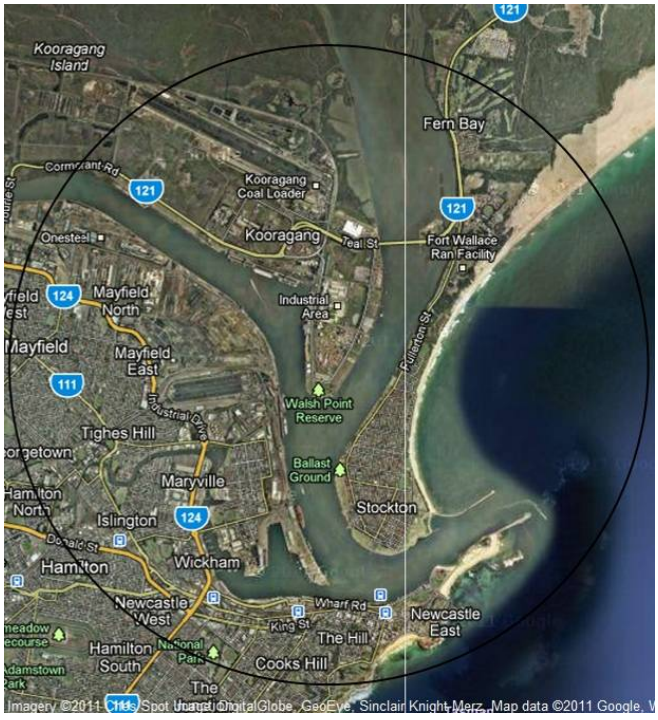
To the Senate Inquiry into health impacts of air quality
From Stockton Community Action Group Inc

We would like to thank you for this Inquiry. We hope that we can get some good outcomes for communities across Australia who are dealing with poor air quality.

We would like to request that the Senate Inquiry comes to Newcastle/Hunter so that you can see first hand what conditions we live with.

By highlighting just one facility on Kooragang Island in the Port of Newcastle, we thought we could best explain what has happened in our suburb

We live in Stockton, Newcastle, please see the map below that shows Stockton as well as the Port of Newcastle & the other suburbs that are within 4 Km of this facility. Approximately 44,000 people live within this area.



On 8 August 2011 the suburb of Stockton had Hexavalent Chromium leaked over it by Orica. That was bad enough but what then happened became quite devastating for many residents. There was no notification to residents for 2 days. Many residents did not find out for 3 days when they heard about it through the media. The incident occurred during the night. Orica notified no one, believing that it had been contained on site. The next morning they realised that it was much worse than they originally believed. They notified the EPA & brought in their top people to deal with the emergency. EPA states they told Orica to notify the Health Department but Orica states they weren't

told to do this. The Health Department was notified the next day. Two Newcastle Councillors were notified by workers & residents of Stockton that something had happened at Orica. They contacted Newcastle City Council who contacted the local EPA & were told that nothing had happened. The 2 Councillors & Newcastle Council were only notified about the incident by the residents & through the media.

We had a number of people displaying symptoms of being exposed to the Hexavalent Chromium. Many visited doctors & hospitals but as the Health Department knew nothing about the incident, they hadn't advised health care professionals to be on the look out for symptoms. Some of the symptoms were bleeding from the nose, weepy eyes, runny nose & sore throat.

We have 2 Primary Schools and 1 Pre School in Stockton. The Pre School was the biggest concern as while it is on the beach side of our peninsular, it was almost directly in line with the Orica fallout. For 2 days Preschoolers played outside with no one knowing that they could have been playing with and exposed to the toxin. Thankfully when the tests were finally carried out, no Hexavalent Chromium was found there. As luck would have it, on 9 August, the day after the incident, a local High School conducted a walkathon around Stockton.

Our group, the Stockton Community Action Group (SCAG) became an entity at this time. Our mission is to "work for a clean and safe community"

In September 2011, Orica leaked an amount of Arsenic into the Hunter River.

The same company, Orica, then had an Ammonia leak causing two workers across the river, on the Mayfield side, to be taken to hospital. This occurred less than 1km from a primary school (on top of a hill). The incident happened at 2pm. One can only imagine what would have happened if it occurred at 3 pm when the students were leaving the school.

After these incidents Orica had a number of other incidents & part & then all of the plant was closed down while they did repairs & upgrades to the site.

It had become apparent that no matter what happens, even with so many breaches, no one seems to have the authority to close down a facility. Indeed, there are currently plans for another ammonium nitrate plant to be built next to the Orica plant on Kooragang Island. As well as enduring the current pollution residents are being subjected to, it is very likely that we will be facing more.

Please see attachment "Three Strikes & not out" that gives a good overview of Orica's performance between August 2011 and March 2012.

Stockton has since had an air monitor established & paid for by Orica. This has been operating since 13/10/12. (Please see attached report). Below is an extract from the summary of the report:

“The Stockton Air Quality Monitoring Station has provided valuable data over the first 3.5 months of operations. While ammonia, NOx, NO2 and PM 2.5 levels have been below standard or targets there is a major concern with the high level of exceedances of PM 10 particles which have exceeded the NEPM standard 13 times in only 3.5 months (5 exceedances allowed per year for natural events). Many of these exceedances correlated with winds directions bringing particles from Kooragang Island. The worst period for winds coming from Kooragang Island are the autumn and winter months and it is likely that the exceedances will increase significantly giving a very high level of exceedances for a one year period of PM10 levels. PM10 daily average reading up to 80 µg/m3 are a concern as are hourly averages exceeding 200 µg/m3 for the community.”

This report highlights how valuable the monitors are. Now that we know about the exceedances we can start to get better outcomes for our community because we have clear proof of the pollution levels.

The outcomes we would like are:

- Get rid of self regulation. It doesn't work.
- All new plants or expansion of existing facilities should aim to have a closed loop system to deal with their own pollution. Pollution produced should be remediated on site
- Base line, up to date and regular data of cumulative impacts of actual and allowable pollution levels from related industries must be made available to the public.
- Cumulative impacts must be taken into account before any new plants are approved. If the cumulative impact is then deemed too great, no new approvals.
- The community’s concerns needs must be taken into account.
- Base line data of cumulative impacts of actual and allowable pollution levels must be made available to the public.
- More monitors need to be established, that can give both the authorities, the companies & the community better understanding of when, how often & what pollution we are being exposed to.

Kate Johnson

Chairperson

Stockton Community Action Group

Three strikes, not out

When a dry storm produces a freak flash of lightning from out of nowhere in clear blue skies, which happens to strike a chimney just as hydrogen is periodically venting and starts a fire, surely it's some kind of omen. By **Brooke Showers**

They say bad luck comes in threes.

For Orica, bad luck just came.

Last year there were eight incidents at Orica's Kooragang Island site, which produces ammonia and ammonium nitrate, reported to the New South Wales Office of Environment and Heritage.

The environmental incidents have prompted significant changes to be made at Orica's mining service and chemical businesses.

Orica managing director Graeme Liebelt said the environmental incidents had been challenging for Orica's mining business.

Former Newcrest Mining chief executive Ian Smith took the reins from Liebelt in March. Liebelt had been with the chemical giant for 22 years, with six of those in charge.

It is Smith's mission to turn Orica's environmental track record around. Another issue on his to do list will be to turn around the performance of Orica's mining consumables business Minova. That company, which Orica acquired in 2006, has failed to really fly.

While Orica's explosives business posted a record profit, Orica was not able to reach the goal of 18% of return on net assets for the Minova wing of the business. Minova recorded a 29% decrease in earnings.

Probably more pressing though will be Kooragang Island. The problems there have been more than local. Some miners in the area failed to meet sales targets as a result of a lack of explosives due to the Kooragang issues. This in turn stalled their blasting plans as the ammonium nitrate plant was temporarily shut down.

Before its environmental issues Orica had plans to expand its Kooragang Island operations and set up an ammonium nitrate storage and distribution facility in the Hunter Valley.

Efforts have been redirected from expansion to generating action plans to improve safety, sustainability and site performance. The company also is working hard on its community relations.

Orica remains hopeful, however, that its Kooragang Island expansion will still go ahead. ▶

Orica's Kooragang Island plant.

The company also has plans for a bulk emulsion facility to be developed in the Pilbara.

Orica's problems began last year when hexavalent chromium was released from its KI ammonia plant in early August. That affected nearby homes in the coastal city of Newcastle in New South Wales.

"In August, we had an incident at our Kooragang Island plant, in which an amount of sodium chromate, containing hexavalent chromium was released, some of which fell into the neighbouring community," Liebelt said. "We have damaged our relationship with the community, and we will have to work to rebuild that trust."

This incident was an enormous wake up call for Orica. It prompted lessons to be learnt at all of Orica's major plants as the company strived to improve its communication processes with the communities and the authorities.

Orica was required by the NSW OEH to complete actions outlined in an independent expert's report, at the plant before restarting the operation.

Later in August, Orica also announced 1.2 megalitres of effluent containing a concentration of 0.067 milligrams per litre of arsenic – higher than permitted levels – was discharged from an effluent storage pond on site into the Hunter River.

Orica stopped using arsenic on the KI site in 1993 and has a long-term program in place to find and clean up any remaining material.

The effluent spill occurred as part of the on-site clean-up activities following the incident earlier in the month. The company said a small amount of arsenic was released and found its way to a storage pond from where it was discharged to the Hunter River.

Adding to the woes, on November 9 an emission of ammonium vapour drifted from the site, which affected a number of workers at a nearby site.

Two further incidents occurred only one month later, sparking more attention from regulators and more PR pain for Orica. On December 7 there was a weak ammonium nitrate fertiliser solution spill at KI. Nine days later there was a sulfuric acid leak at Orica's Port Kembla facility, south of Wollongong.

Between August 8 and December 14, the KI ammonium plant remained closed due to an OEH prevention notice.

The plants at KI were intended to be back online and producing ammonium nitrate as of December 15. The community was reassured KI would be restarted safely. However, the plant was not restarted until January 3. Orica made the decision to delay the start to modify some equipment there.

Orica's luck had definitely not changed though. On December 16 the company reported a contained leakage of about 4000 litres of sulfuric acid from a pipe at its Port Kembla facility.

The acid leaked from the ship-to-shore pipeline and was contained within a concrete culvert.

Although there was no danger or risk to the community or the environment, the cause of the leakage is still being investigated and believed to be from a small hole in the pipeline.

Orica said the containment system had worked as it was designed to and no employees were endangered.

Back at the KI plant, Australia/Asia sustainability manager Sean Winstone was appointed as site manager for the start-up phase.

Winstone has more than 20 years of ammonia and ammonium nitrate manufacturing experience. He was previously responsible for all of Orica's large nitrate sites.

> "While it is not part of Orica's normal start up procedures, the ignition of hydrogen from a vent stack is not a unique event."
>
> – Orica sustainability manager Sean Winstone

Winstone is also part of the start-up oversight team, which includes mining services manufacturing and supply chain manager Molly Zhang and group general manager major projects Richard Hoggard.

A start-up support team has been formed with three experienced nitrate site managers as well as former Orica global nitrates manager Russell Higgins and corporate safety, health and environment systems development manager Simon Farrar.

Independent ammonia process technology experts also were brought in from leading global engineering firms to review plans and provide expert advice during start up.

"We recognise that having the correct expertise onsite for this restart is important," Winstone said in December. "So we won't move into the start-up phase until we have the appropriate oversight in place."

Orica was not satisfied with the performance of one of its compressors at the KI ammonia plant on January 24 so the plant was shut down again. The company said it was not prepared to proceed with the restart while the compressor could not perform as designed.

That was not the only incident to bedevil the troubled plant. On January 8, lightning struck, as an electrical storm ignited hydrogen gas venting from a stack at the KI ammonia plant.

State regulators said the flare posed no environmental risk.

The venting of hydrogen gas was part of the normal plant start-up process and its ignition produced a visible flare to nearby residents.

"While it is not part of Orica's normal start up procedures, the ignition of hydrogen from a vent stack is not a unique event," Winstone said.

"It has happened in the past both at Orica and at other parts and we have procedures in place to manage it.

"Hydrogen, a colourless, odourless, non-toxic gas, which produces water when it burns, is produced by the plant and is discharged from vent stacks during the restart process.

"Some plants will deliberately ignite it during the restart process.

"At Orica we do not deliberately light the gas as part of our standard procedures but the flare poses no risk to the community or to the plant."

After visits from NSW Fire & Rescue and NSW Workcover it was determined the flare posed no risk and the re-start could continue.

"The highly visible flame, which was caused as a result of lightning strikes is unusual and has only occurred due to electrical storm activity at the same time as the ammonia's plant start-up," Environmental Protection Authority chief environmental regulator Mark Gifford said.

Orica used its SMS system to alert local residents.

"I cannot stress enough the importance of communicating quickly and effectively with the community and I was pleased to see that Orica had taken this on board in this instance," Gifford said.

On January 18, Orica was blasted again by the EPA with another potential breach of its environmental license, when its Botany plant tested positive to breaking the mercury emission limit.

A direct thermal desorption plant stack at Orica's Carpark waste pemediation project registered a reading of 0.49 milligrams per cubic metre of mercury in an EPA air sample. The legal limit is 0.2mg/cu.m.

The plant was closed at the time of the incident for regular maintenance. The EPA advised Orica not to restart the plant until the reasons for the breach had been fully investigated and any issues resolved to prevent a reoccurrence.

EPA acting chief environmental regulator Gary Whytcross said the potential breach did not pose any risk to public health or the environment and was relatively minor in nature, as "a reading of 0.49 milligrams per cubic metre is still well within safe limits".

The hits just keep on coming.

Recently Orica was rocked by the Danish government's cancellation of shipments of hexachlorbenzene shipments from Botany to Denmark. This has forced Orica to explore alternative options for safe destruction.

The waste remains safely stored at Botany until the issue can be resolved. AMM

Stockton Air Quality Monitoring Station Report No1

1. Introduction

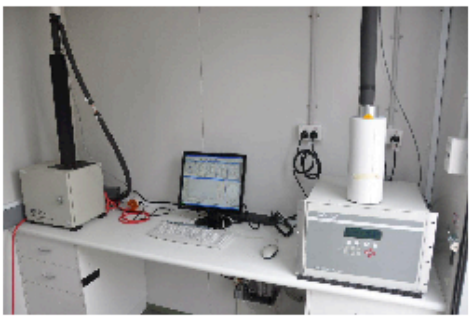
Following representations and a proposal from the Stockton Community Action Group, Orica agreed to install an air quality monitoring station in Stockton.

The station design and equipment selected was undertaken in consultation with OEH and the EPA to ensure the station met the OEH standards. The station was installed and commenced operation on the 13 October 2013.

Orica Air Quality Monitoring Station Stockton

The station included monitoring for:

1. PM10 particles
2. PM2.5 particles
3. Ammonia
4. NOx
5. NO_2



PM10 and PM2.5 Monitors

Ammonia, NOx and NO2 Monitor

An ANSTO PM10 and PM2.5 analyser was also leased to allow collection of these particles for analysis/speciation by ANSTO and the CSIRO. Orica employed the company Ecotech to design, install, commission and service the monitoring station. Ecotech also developed a website which provides the following information:

1. Live data for wind direction and speed
2. PM10 1hr and 24 hr data
3. PM2.5 1 hr and 24 hr data
4. Ammonia 1 hr data
5. NOx 1 hr data
6. NO_2 1 hr data

There are also for the current month and previous month graphs for:

1. PM 10 average hr
2. PM10 daily average
3. PM 2.5 hourly average
4. PM2.5 daily average
5. Ammonia hourly average
6. NOx hourly average
7. NO2 hourly average
8. Wind direction hourly average
9. Wind speed hourly average

Data from previous months is also archived on the website.

2. Review of Data from 13 October 2012 to 1 February 2013

The monitoring station has now been operating for approximately 3.5 months and has provided useful trends and performance after this period. An overview of the data and performance with particle levels against the NEPM standards are assessed from the data.

2.1. PM10 Particles

PM10 particles (< 10 µm) have varied from 4.4 to >200 µg/m^3 for hourly average readings and from 8.0 to 80 µg/m^3 for daily average readings. In only the 3.5 months of operation there have been 13 exceedances of the NEPM standard of 50 µg/m^3. The NEPM standard allows for 5 exceedances a year to allow for natural events such as bushfires.

The data shows in only 3.5 months the 5 requirement has easily been exceeded (13 exceedances) indicating significant air quality issues in Stockton that requires more detailed investigation by the NSW Government. The high hourly peaks exceeding 200 µg/m3 are also a concern for the community. Many of the daily average exceedances have corresponded with winds from the west to north-west direction bringing winds from Kooragang Island.

The exceedances are outlined in Table 1 below; the January 2013 graph for the daily average PM10 levels is shown in figure 1 and January 2013 graph for PM10 hourly average in Figure 2.

Table 1: PM10 NEPM Standard Exceedances

Date	Reading (µg/m³)	Comment
16/10/12	50.3	
17/10/12	52.2	
25/10/12	61.0	
5/11/12	51.5	
6/11/12	59.4	
7/11/12	62.0	
21/11/12	52.9	
8/12/12	50.8	
11/1/13	74	Read from graph
18/1/13	72	Read from graph
29/1/13	65	Read from graph
31/1/13	80	Read from graph
1/2/13	62	Read from graph

Figure 1: PM10 Daily Average Graph for January 2013

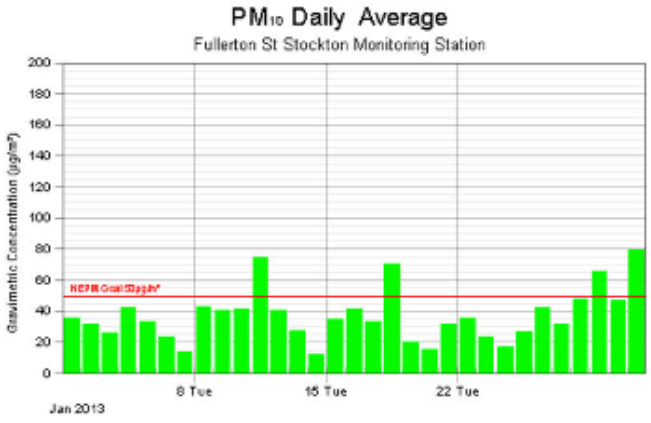
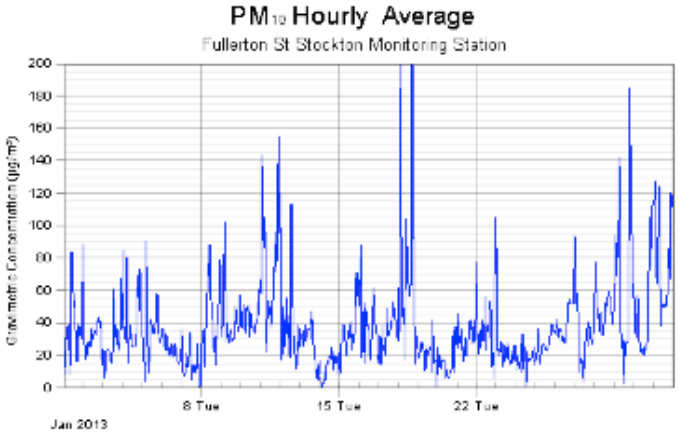


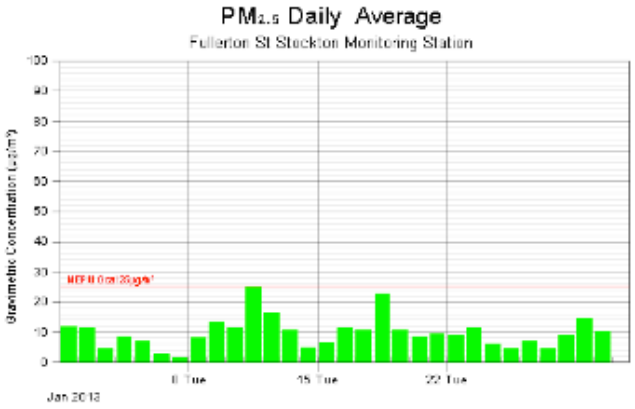
Figure 2: PM10 Hourly Average Graph for January 2013



2.2. PM 2.5 Particles

The PM 2.5 particles (< 2.5 µm) have varied from 0 to >134 µg/m³ for hourly average readings and from 1 to 25 µg/m³ for daily average readings. The NEPM target level of 25 µg/m³ for PM2.5 particles has not been exceeded in the first 3.5 months of operation. The daily average for PM 2.5 particles for January 2013 is shown in Figure 3 below.

Figure 3: PM2.5 Daily Average Graph for January 2013

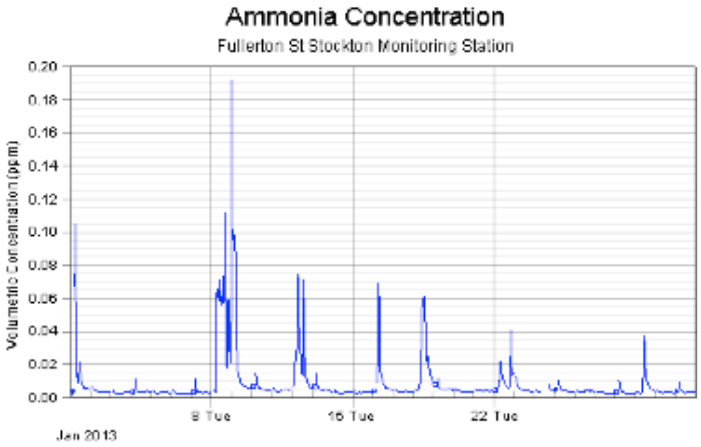


2.3. Ammonia

Ammonia levels have generally been low in the first 3.5 months of monitoring however there have been a number of peaks that have caused concern for the community and are likely to be related to fugitive releases from the Orica Kooragang Island (KI) plant.

Generally ammonia levels range from 0.004 to 0.02 ppm with peaks up to 0.19 ppm. The peaks correlate with winds directions from the Orica KI plant. Figure 4 shows the ammonia 1 hour average graph for January 2013.

Figure 4: Ammonia 1 hour Average Graph for January 2013



2.4. NOx and NO_2

NOx and NO_2 levels have generally been low and the NO_2 levels have been below the NEPM standard. However there appears to be regular peaks and occasional higher peaks in NOx and NO_2 hourly average readings. The NOx hourly average readings have varied from 0.001 to 0.11 ppm and NO_2 hourly average readings varied from 0.001 to 0.044 ppm which is below the NO_2 NEPM standard of 0.12 ppm.

Figures 5 and 6 show the hourly average graphs for NOx and NO2 for January 2013.

Figure 5: NOx Hourly Average Graph for January 2013

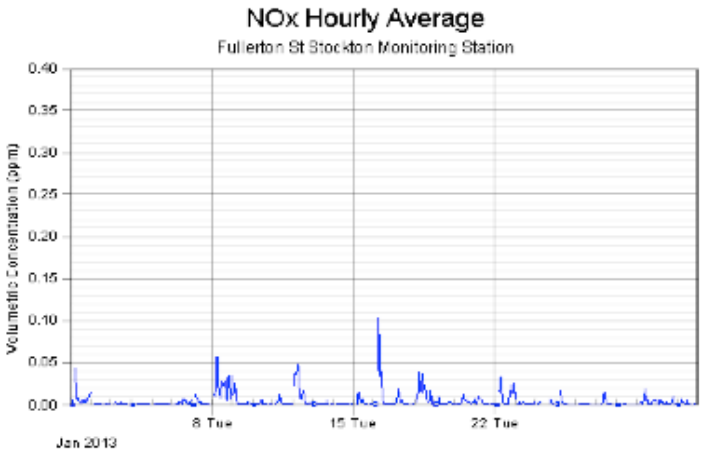
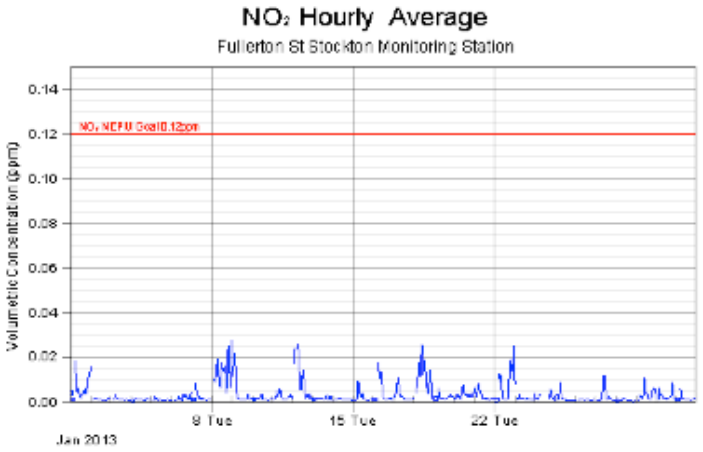


Figure 5: NO_2 Hourly Average Graph for January 2013



2.5. Wind Direction Effect Example

Wind direction can make a significant difference to fine particle levels particularly PM10 levels. The figures below show the effect of wind direction. PM 10 hourly average levels rose to >170 µg/m³ with winds from the west to north range (Kooragang Island (KI) direction) and dropped sharply to <30 µg/m³ when the wind direction changed to southerly direction (not from industry). This is also reflected in the PM10 daily average which exceeded the NEPM standard on the 1 February with northwest winds (KI direction) with a value of >60 µg/m³ and dropped to <20 µg/m³ with strong southerly winds (not from industry).

Figure 6: PM10 Hourly Graph 1 and 2 February 2013

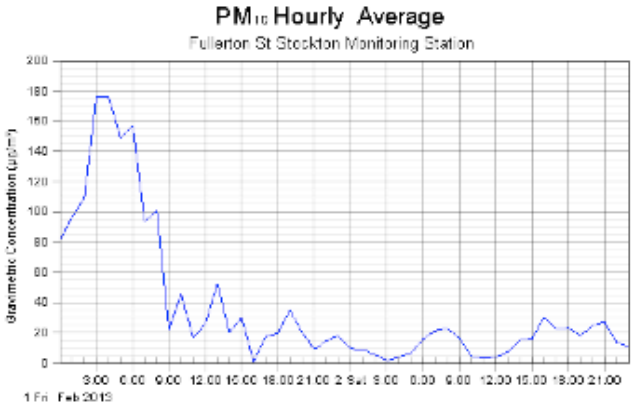


Figure 7: PM10 Daily Average Graph 1 and 2 February 2013

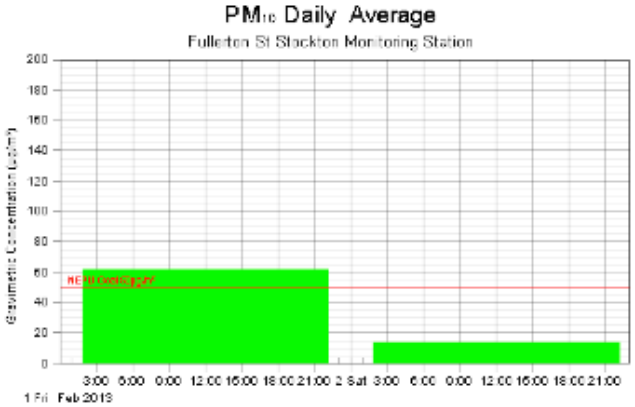
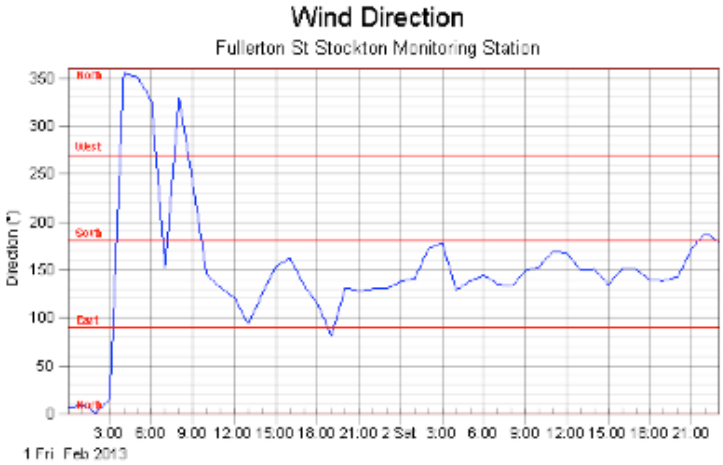


Figure 8: Wind Direction 1 and 2 February 2013



3. Summary

The Stockton Air Quality Monitoring Station has provided valuable data over the first 3.5 months of operations. While ammonia, NOx, NO_2 and PM 2.5 levels have been below standard or targets there is a major concern with the high level of exceedances of PM 10 particles which have exceeded the NEPM standard 13 times in only 3.5 months (5 exceedances allowed per year for natural events). Many of these exceedances correlated with wind directions bringing particles from Kooragang Island.

The worst period for winds coming from Kooragang Island are the autumn and winter months and it is likely that the exceedances will increase significantly giving a very high level of exceedances for a one year period of PM10 particles. PM10 daily average readings up to 80 $\mu g/m^3$ are a concern as are hourly averages exceeding 200 $\mu g/m^3$ for the community.

These levels cause significant health concerns for the Stockton community and concerns that new industries will create increased fine particle pollution such as the T4 project.

The Stockton air quality monitoring station clearly shows how the current monitoring stations in Newcastle do not provide a complete picture of pollution from industry in the Newcastle LGA and the urgent need for the new air quality monitoring stations being implemented by the EPA at Carrington, Mayfield, Stockton and Fern Bay.

It is noted these PM10 particle levels are worse than many of the current EPA Upper Hunter monitoring station results.

The particle analysis data from particles collected in the ANSTO monitor at the Stockton monitoring site should begin to provide data in the first half of 2013 for the chemical composition of the fine particles.

3.1. Recommendations

The following recommendations are:

1. This report is copied to the Minister for the Environment Robyn Parker, The EPA Chairman and Board members, key personnel in the EPA in Newcastle and Sydney.

2. The EPA/OEH undertake a study to evaluate the sources of the high particle levels including correlating graphs of PM10 and PM 2.5 levels at monitors across the region with the Stockton monitoring station. The graphical data of sites from the Upper Hunter, Newcastle and Stockton be prepared by the Sydney office of the EPA for the March NCCCE meeting.

3. The new monitoring stations proposed for Carrington, Mayfield and Fern Bay are installed as soon as possible.