



Stephen Parry
Chief Executive
Gore District Council
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Land and Water Science
61 Leet Street
Invercargill

18 May 2018

Dear Stephen

RE: Weekly NH₃ Monitoring Report 18 March – 30 April (Weeks 20 – 25)

In April 2018 Gore District Council (GDC) engaged Land and Water Science to conduct continuous monitoring of ammonia (NH₃) gas emissions from the Mataura Mill dross storage site (121 Kana Street, Mataura). Previously, e3 scientific has been contracted to install the sensors and provide reporting to March 2018. GDC require emission values to comply with consent conditions that specify a limit of 5 ppm NH₃ discharged to air. In November 2017, Photonic Innovations (PI) installed two NH₃ Sensors for comparison of the indoor and outdoor ammonia levels. The outdoor sensor has been out of service since 18 March 2018. PI are currently in the process of rectifying connectivity issues and re-building to sensor for installation in May.

Fortnightly summaries of the indoor emission results from weeks 20 – 25 of monitoring are presented in this report. During monitoring from March - April, the maximum NH₃ concentrations detected by the indoor sensor were up to 12 ppm, with a mean concentration of 4.7 ppm, and a median concentration of 4.1 ppm (Figure 1; Table 1). Air temperatures are expected to continue to decrease during Autumn, which has been reflected in the diurnal variation of indoor NH₃ concentrations being more subdued. A brief period of warmer weather occurred in weeks 20 and 21 and initiated several days of stronger diurnal variation.

Since the outdoor sensor has been disconnected, the indoor sensor will be used as a proxy for outdoor NH₃ concentrations. Typically, indoor concentrations have exceeded outdoor, especially during warm days when the diurnal emission pattern is evident (Figure 1). During the six weeks monitored it is likely that outdoor concentrations were acceptable as the average indoor concentration was 4.7 ppm.

For public access to the real-time data go here: <http://35.189.3.224:3000/login>
Log in email: gcc@photonicinnoventions.com and use the password: Pa5%w0rd

Table 1. Summary statistics for the indoor NH₃ sensor, weeks 20 - 25 (18 March - 30 April 2018). NH₃ measured in parts per million (ppm).

	18 MAR - 30 APR 2018	18 MAR - 31 MAR 2018	1 APR - 15 APR 2018	16 APR - 30 APR 2018
MEAN	4.7	6.9	4.0	3.4
STANDARD ERROR	0.0	0.0	0.0	0.0
MEDIAN	4.1	6.7	3.8	3.4
MODE	3.8	6.4	2.9	3.5
MINIMUM	0.1	3.1	0.1	1.3
MAXIMUM	12.0	12.0	8.7	6.7
CONFIDENCE LEVEL (95.0%)	0.1	0.1	0.1	0.0

Weeks 20 and 21: 18th – 31st March 2018

For weeks 20 and 21 of monitoring, indoor NH₃ concentration showed consistent diurnal variation for most of the fortnight. Maximum indoor concentration was 12 ppm for this period. Mean and median values were 6.9 ppm and 6.7 ppm, respectively.

Weeks 22 and 23: 1st – 15th April 2018

The diurnal variation pattern was present during week 22 however by week 23 it had ceased, coinciding with a reduction in daily temperature variation. The indoor sensor showed five days of diurnal change in concentrations (Figure 1) with peaks at 8.7 ppm and a mean and median of 4 ppm and 3.8 ppm respectively. Although the outdoor sensor wasn't working, it is likely that outdoor concentrations were acceptable during this fortnight.

Weeks 24 and 25: 16th – 30th April 2018

During weeks 24 and 25 there were few events of elevated indoor NH₃. Maximum concentration was 6.7 ppm and mean and median values were both 3.4 ppm. As the indoor concentration was significantly below the outdoor limit of 5 ppm, it is likely the outdoor emissions during this monitoring period were also acceptable.

Summary

The outdoor sensor has been disconnected for maintenance since 18 March 2018. Installation is planned by PI for late-May 2018. During the six-week monitoring period (18 March – 30 April) indoor NH₃ concentrations were a maximum of 12 ppm. Mean concentration of 4.7 ppm, and a median concentration of 4.1 ppm. These values are consistent with that expected in the current cool weather conditions, and no signs of increased NH₃ gas activity have been detected during this period. Temperature, at this stage appears to be the dominant control over NH₃ concentrations on site.

Kind regards,



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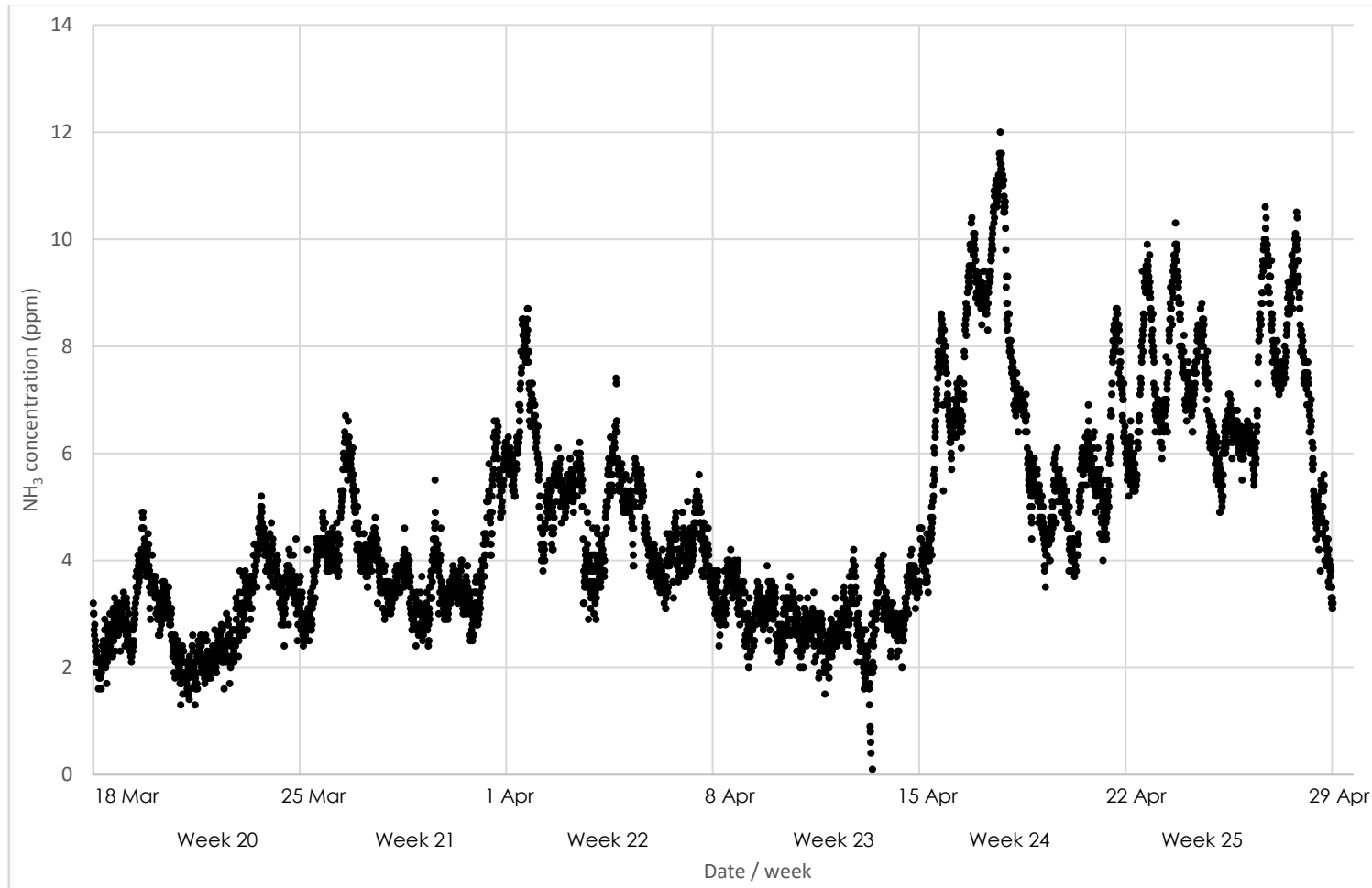


Figure 1: Continuous NH₃ Concentration at Matura for 18 March – 30 April 2018 (Weeks 20 - 25 of monitoring). Only the indoor sensor remains connected.