

23 March 2018

Chris Schneider
Managing Director
National Ceramic Industries Australia
PO Box 765
Maitland NSW 2320

Dear Chris

Environmental Monitoring for National Ceramic Industries Australia - February 2018

Please find enclosed the documentation for the environmental monitoring carried out for National Ceramic Industries Australia during February 2018. Sampling methodology and adopted assessment criteria are detailed below.

1.0 Sampling Methodology

Sampling was performed by AECOM Australia Pty Ltd (AECOM) and sample analysis was carried out by ALS NATA accredited laboratory. All sampling and analysis was carried out in accordance with Environmental Protection Authority (EPA) approved methods with reference to the following Australian Standards:

- Monitoring of fine suspended particulates (PM₁₀) on the EPA six day cycle in accordance with:
 - AS/NZS 3580.9.6 (2015) *Methods for the Sampling and Analysis of Ambient Air – Determination of Suspended Particulate Matter – PM₁₀ High Volume Sampler with Size Selective Inlet - Gravimetric Method.*
- Monitoring of fluorides in ambient air in accordance with:
 - AS/NZS 3580.13.2 (2013) *Determination of fluorides—Gaseous and acid-soluble particulate fluorides—Manual, double filter paper sampling.*
- Meteorological monitoring in accordance with:
 - AS 3580.1.1 (2007) – *Methods for sampling and analysis of ambient air – Part 1.1 – Guide to siting air monitoring equipment; and*
 - AS 3580.14 (2014) – *Methods for sampling and analysis of ambient air – Part 14: Meteorological monitoring for ambient air quality monitoring.*
- Monitoring of surface water quality in accordance with:
 - AS/NZS 5667.1 (1998) *Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples; and*
 - AS/NZS 5667.4 (1998) *Guidance on sampling from lakes, natural and manmade.*

2.0 Assessment Criteria

Suspended particulate loads are assessed against the impact assessment criteria defined in the Project Approval conditions (09_0006 – National Ceramic Industries Australia Tile Manufacturing Facility Expansion Project, 19 January 2012). The assessment criteria for PM₁₀ (particulate matter with an aerodynamic diameter of less than 10 µm) are:

- 50 µg/m³ over a 24-hour period; and
- 30 µg/m³ as an annual average.

Ambient fluoride concentrations are assessed against the guidelines defined in NSW EPA *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (NSW EPA (2016)). The NSW EPA impact assessment criteria for ambient fluoride are:

- 2.9 µg/m³ over a 24-hour period; and
- 1.7 µg/m³ over a 7-day period.

Surface waters are assessed in accordance with default trigger values for physical and chemical stressors for southeast Australia in the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC, 2000). These values are:

- pH in the range of 6.5 - 8.5 (Table 3.3.2 - NSW Lowland River); and
- Electrical conductivity (EC) in the range of 125 – 2200 $\mu\text{S}/\text{cm}$ (Table 3.3.3 - NSW Lowland River).

3.0 Monitoring Results

Monitoring results for the month of February 2018 are presented in the attachments to this letter. Monitoring results for the preceding two months are also presented to demonstrate quarterly trends in results.

The South East monitoring location recorded a PM_{10} concentration of $50.9 \mu\text{g}/\text{m}^3$ on 12 February 2018, above the consent 24 hour criterion of $50 \mu\text{g}/\text{m}^3$. Data sourced from the EPA Beresfield site and the NCIA North West monitoring site indicates that the South East PM_{10} concentration of $50.9 \mu\text{g}/\text{m}^3$ is above the typical regional concentrations measured on this day.

Meteorology data from the onsite station shows that the wind for 12 February was predominantly from the South East, with less than 20% of winds not blowing from the South East quadrant. This places the NCIA facility downwind of the South East monitoring station for a large majority of 12 February. It has been observed that off-site earthworks are occurring to the South East of the facility with front end loaders observed to be filling tipper trucks with heavy vehicles operating on unsealed roads. Given the wind direction, it is highly unlikely the NCIA facility is the source of the PM_{10} leading to this exceedance and it is probable that the off-site earthworks have resulted in the elevated PM_{10} concentrations recorded at the South East sampler on 12 February. A wind rose showing the conditions for 12 February is attached.

An Environmental Incident Report detailing this exceedance was submitted to Leah Cook (Department of Planning and Environment) on 13 February upon AECOM receiving the laboratory analysis results.

All remaining February PM_{10} monitoring results were below the consent 24 hour criterion of $50 \mu\text{g}/\text{m}^3$. The PM_{10} rolling annual average concentrations at both the North West and South East sites remain below the Project Approval annual criterion of $30 \mu\text{g}/\text{m}^3$. The North West annual average sits at $25.9 \mu\text{g}/\text{m}^3$ following the completion of the February monitoring period while the South East average is $17.7 \mu\text{g}/\text{m}^3$.

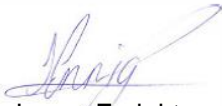
Fluoride results for February remain below the relevant assessment criteria at both the North West and South East monitoring sites with no exceedances of either the 24 hour or 7 day criteria this month.

The adopted ANZECC 2000 guidelines for pH and conductivity are the default trigger values for slightly disturbed aquatic ecosystems in NSW lowland rivers. All Pond 4 pH readings during February were within the ANZECC 2000 pH guidelines with the exception of readings for 8 and 22 February where results above 8.5 were returned. Pond 4 was not observed to be discharging offsite on either of these days. All Pond 4 EC readings taken during the February monitoring period were within the ANZECC guidelines. Water temperature was also measured weekly however no guideline is available for assessment. Pond 4 was not observed to be discharging during any of the February site visits.

Monitoring results and plots can be found attached including the wind rose for February. Laboratory certificates, field sheets and calibration data along with relevant meteorology data can be provided on request.

If you require any further information, please contact James McIntyre on 0407 456 232.

Yours faithfully



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encl: Monitoring data tables and charts, wind roses



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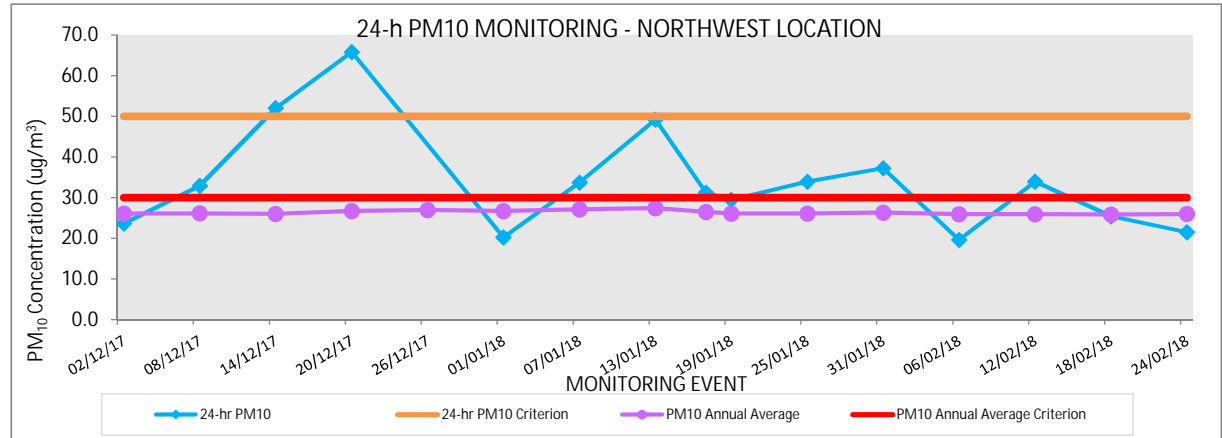
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North West Monitoring Location - 24 hour PM10 Monitoring

North West - 24 hour PM10 Monitoring				
December 2017 to February 2018				
Monitoring Event	24-hr PM ₁₀	24-hr PM ₁₀ Criterion	PM ₁₀ Annual Average	PM ₁₀ Annual Average Criterion
	($\mu\text{g}/\text{m}^3$)	($\mu\text{g}/\text{m}^3$)	($\mu\text{g}/\text{m}^3$)	
2-Dec-17	23.6	50	26.0	30
8-Dec-17	32.9	50	26.1	30
14-Dec-17	52.0	50	26.0	30
20-Dec-17	65.8	50	26.7	30
26-Dec-17		50	26.9	30
1-Jan-18	20.2	50	26.7	30
7-Jan-18	33.7	50	27.1	30
13-Jan-18	49.2	50	27.4	30
17-Jan-18	31.2	50	26.4	30
19-Jan-18	29.4	50	26.0	30
25-Jan-18	33.9	50	26.1	30
31-Jan-18	37.2	50	26.3	30
6-Feb-18	19.6	50	25.9	30
12-Feb-18	33.9	50	25.9	30
18-Feb-18	25.4	50	25.8	30
24-Feb-18	21.5	50	25.9	30

*No sample taken on 26/12/2017 due to no power. Catch up performed 17/1/18.

*Bold denotes exceedance

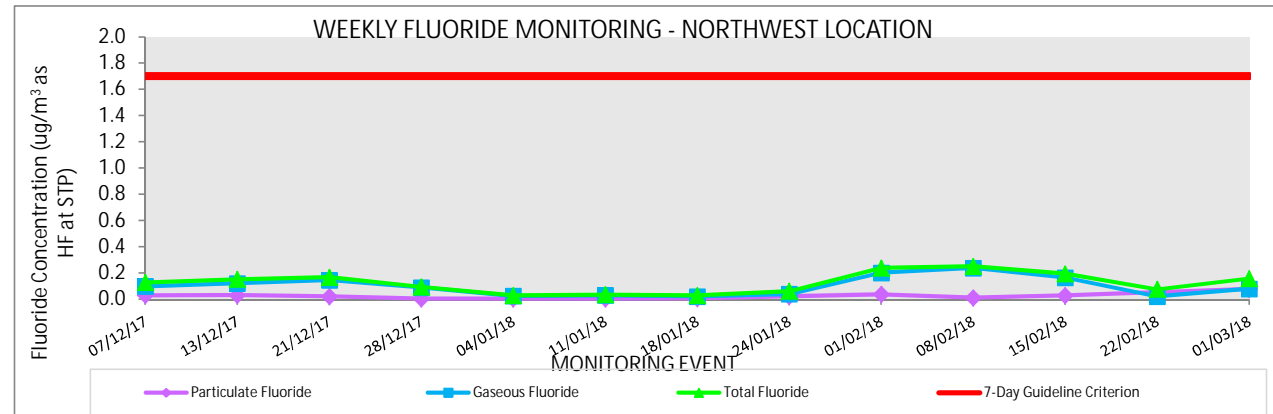


North West Monitoring Location - 7 Day Fluoride Monitoring

North West - 7 Day Fluoride Monitoring
December 2017 to February 2018

Monitoring Event	Particulate Fluoride	Gaseous Fluoride	Total Fluoride	7-Day Guideline Criterion
	($\mu\text{g}/\text{m}^3$ as HF at STP)	($\mu\text{g}/\text{m}^3$ as HF at STP)	($\mu\text{g}/\text{m}^3$ as HF at STP)	($\mu\text{g}/\text{m}^3$ as HF at STP)
7-Dec-17	0.030	0.098	0.128	1.7
13-Dec-17	0.031	0.121	0.152	1.7
21-Dec-17	0.022	0.146	0.168	1.7
28-Dec-17	0.005	0.090	0.095	1.7
4-Jan-18	0.004	0.025	0.029	1.7
11-Jan-18	0.005	0.030	0.035	1.7
18-Jan-18	0.007	0.022	0.029	1.7
24-Jan-18	0.022	0.040	0.062	1.7
1-Feb-18	0.037	0.202	0.239	1.7
8-Feb-18	0.012	0.239	0.251	1.7
15-Feb-18	0.029	0.166	0.195	1.7
22-Feb-18	0.054	0.022	0.076	1.7
1-Mar-18	0.078	0.080	0.158	1.7

*Sample for 28/12/17 only ran approximately two days after onsite power was lost over Christmas period



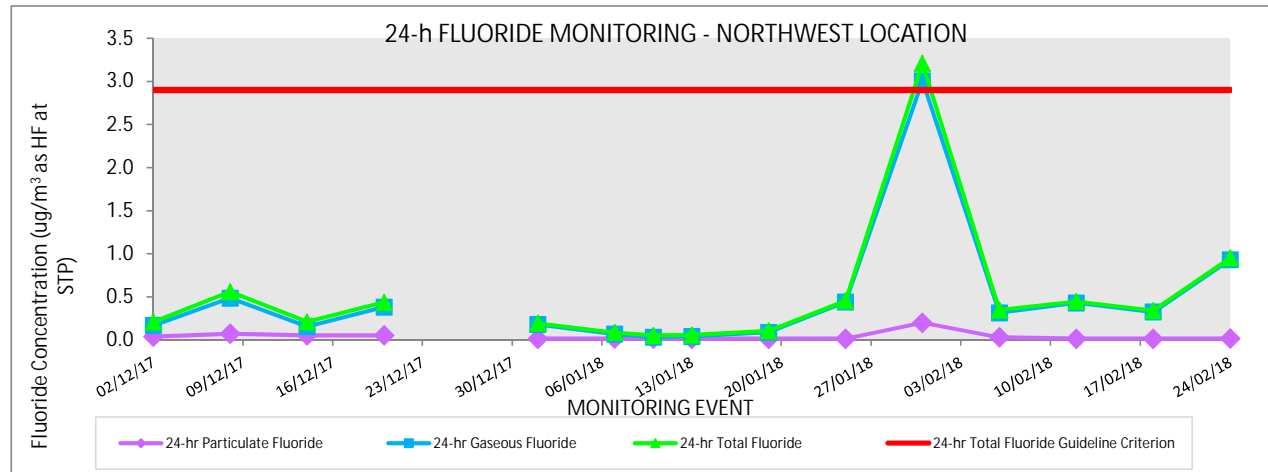
North West Monitoring Location - 24 hour Fluoride Monitoring

North West - 24 hour Fluoride Monitoring
December 2017 to February 2018

Monitoring Event	24-hr Particulate Fluoride	24-hr Gaseous Fluoride	24-hr Total Fluoride	24-hr Total Fluoride Guideline Criterion
	($\mu\text{g}/\text{m}^3$ as HF at STP)	($\mu\text{g}/\text{m}^3$ as HF at STP)	($\mu\text{g}/\text{m}^3$ as HF at STP)	($\mu\text{g}/\text{m}^3$ as HF at STP)
2-Dec-17	0.041	0.170	0.211	2.9
8-Dec-17	0.075	0.488	0.563	2.9
14-Dec-17	0.056	0.158	0.214	2.9
20-Dec-17	0.055	0.385	0.440	2.9
26-Dec-17				2.9
1-Jan-18	0.016	0.181	0.197	2.9
7-Jan-18	0.018	0.071	0.089	2.9
10-Jan-18	0.018	0.035	0.053	2.9
13-Jan-18	0.017	0.043	0.060	2.9
19-Jan-18	0.016	0.091	0.107	2.9
25-Jan-18	0.016	0.443	0.459	2.9
31-Jan-18	0.202	3.009	3.211	2.9
6-Feb-18	0.033	0.317	0.350	2.9
12-Feb-18	0.016	0.433	0.449	2.9
18-Feb-18	0.017	0.326	0.343	2.9
24-Feb-18	0.019	0.934	0.953	2.9

Bold Denotes Exceedance

*No sample taken on 26/12/17 due to no power. Catchup performed 10/1/18

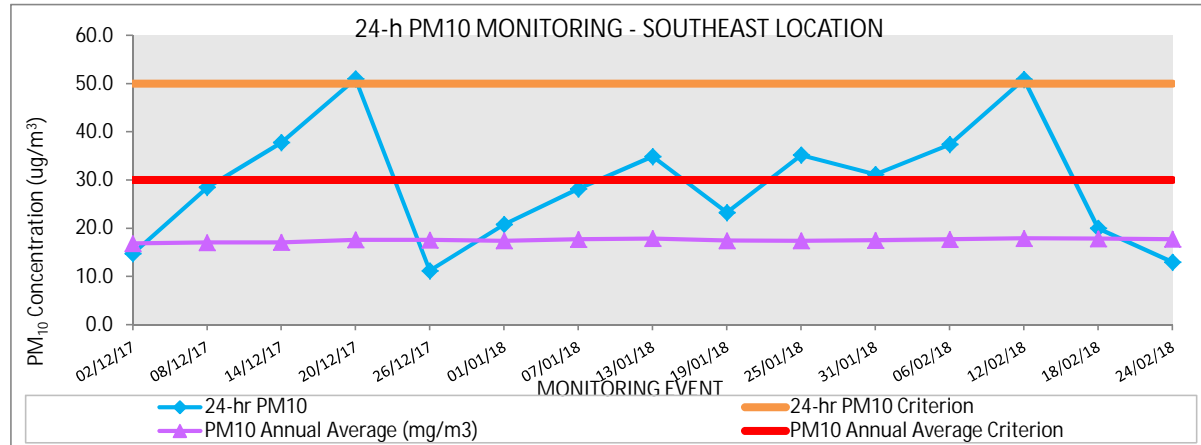


South East Monitoring Location - 24 hour PM10 Monitoring

South East - 24 hour PM10 Monitoring
December 2017 to January 2018

Monitoring Event	24-hr PM ₁₀	24-hr PM ₁₀ Criterion	PM ₁₀ Annual Average	PM ₁₀ Annual Average Criterion
	(µg/m ³)	(µg/m ³)	(µg/m ³)	
2-Dec-17	14.8	50	16.9	30
8-Dec-17	28.5	50	17.0	30
14-Dec-17	37.8	50	17.1	30
20-Dec-17	51.0	50	17.6	30
26-Dec-17	11.2	50	17.6	30
1-Jan-18	20.8	50	17.4	30
7-Jan-18	28.2	50	17.7	30
13-Jan-18	34.9	50	17.9	30
19-Jan-18	23.3	50	17.5	30
25-Jan-18	35.2	50	17.4	30
31-Jan-18	31.2	50	17.5	30
6-Feb-18	37.4	50	17.7	30
12-Feb-18	50.9	50	17.9	30
18-Feb-18	20.0	50	17.8	30
24-Feb-18	13.0	50	17.7	30

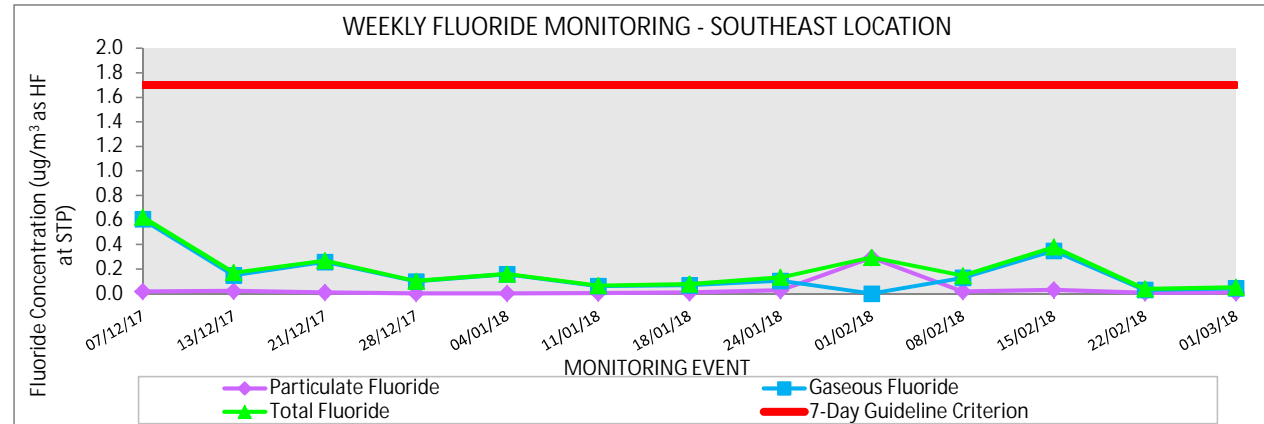
*Bold denotes exceedance



South East Monitoring Location - 7 Day Fluoride Monitoring

South East - 7 Day Fluoride Monitoring
December 2017 to February 2018

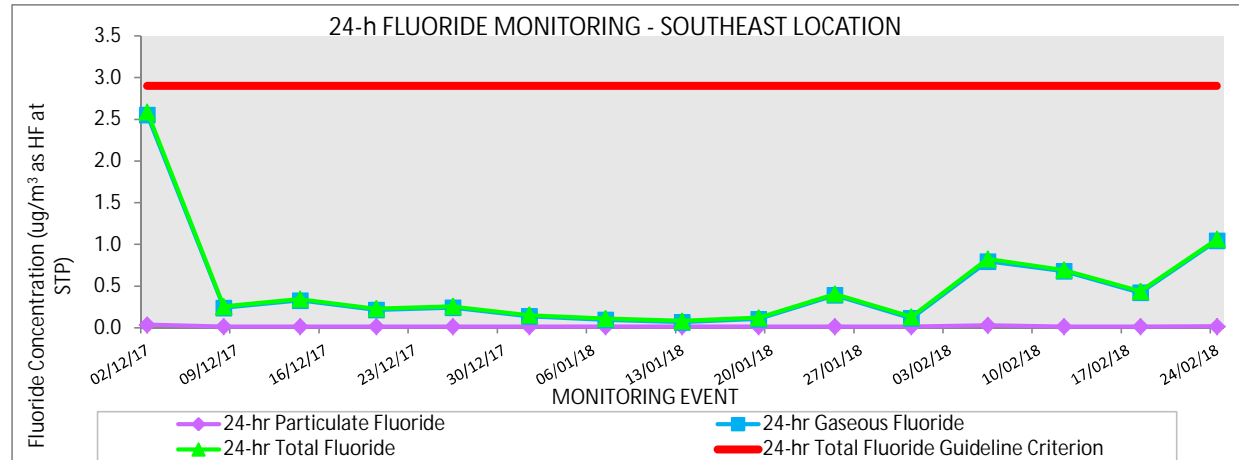
Monitoring Event	Particulate Fluoride	Gaseous Fluoride	Total Fluoride	7-Day Guideline Criterion
	($\mu\text{g}/\text{m}^3$ as HF at STP)	($\mu\text{g}/\text{m}^3$ as HF at STP)	($\mu\text{g}/\text{m}^3$ as HF at STP)	($\mu\text{g}/\text{m}^3$ as HF at STP)
7-Dec-17	0.017	0.607	0.624	1.7
13-Dec-17	0.021	0.150	0.171	1.7
21-Dec-17	0.010	0.259	0.269	1.7
28-Dec-17	0.002	0.100	0.102	1.7
4-Jan-18	0.002	0.158	0.160	1.7
11-Jan-18	0.004	0.062	0.066	1.7
18-Jan-18	0.009	0.068	0.077	1.7
24-Jan-18	0.027	0.105	0.132	1.7
1-Feb-18	0.294	0.001	0.295	1.7
8-Feb-18	0.017	0.130	0.147	1.7
15-Feb-18	0.030	0.350	0.380	1.7
22-Feb-18	0.007	0.031	0.038	1.7
1-Mar-18	0.009	0.043	0.052	1.7



South East Monitoring Location - 24 hour Fluoride Monitoring

South East - 24 hour Fluoride Monitoring
December 2017 to February 2018

Monitoring Event	24-hr Particulate Fluoride	24-hr Gaseous Fluoride	24-hr Total Fluoride	24-hr Total Fluoride Guideline Criterion
	($\mu\text{g}/\text{m}^3$ as HF at STP)	($\mu\text{g}/\text{m}^3$ as HF at STP)	($\mu\text{g}/\text{m}^3$ as HF at STP)	($\mu\text{g}/\text{m}^3$ as HF at STP)
2-Dec-17	0.036	2.553	2.589	2.9
8-Dec-17	0.016	0.24	0.256	2.9
14-Dec-17	0.016	0.329	0.345	2.9
20-Dec-17	0.016	0.214	0.230	2.9
26-Dec-17	0.015	0.242	0.257	2.9
1-Jan-18	0.015	0.139	0.154	2.9
7-Jan-18	0.016	0.096	0.112	2.9
13-Jan-18	0.015	0.068	0.083	2.9
19-Jan-18	0.015	0.105	0.120	2.9
25-Jan-18	0.015	0.391	0.406	2.9
31-Jan-18	0.016	0.116	0.132	2.9
6-Feb-18	0.031	0.796	0.827	2.9
12-Feb-18	0.016	0.679	0.695	2.9
18-Feb-18	0.016	0.423	0.439	2.9
24-Feb-18	0.017	1.046	1.063	2.9

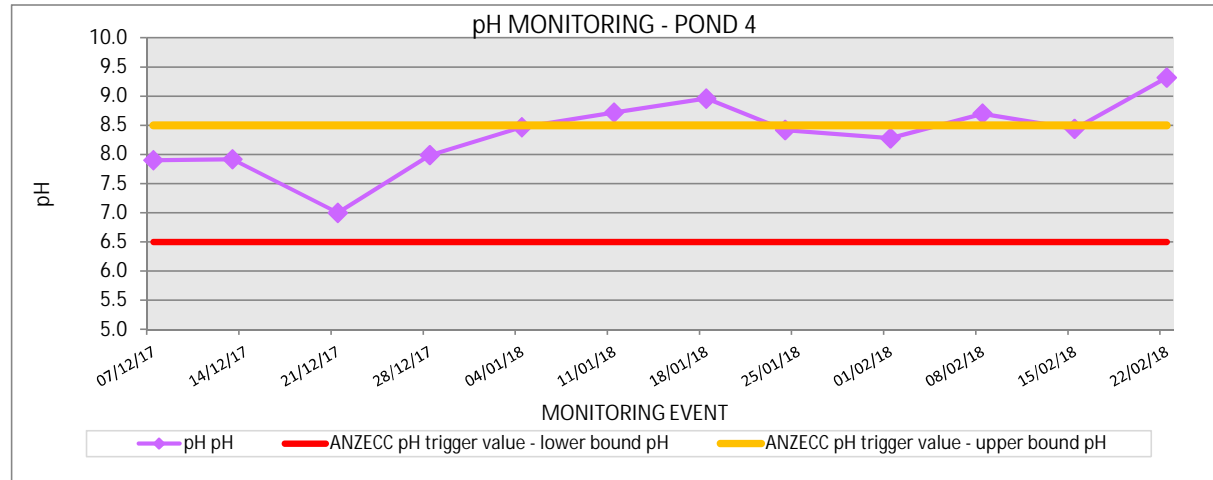


Pond 4 Monitoring Location - Weekly pH Monitoring

Pond 4 - Weekly pH Monitoring
December 2017 to February 2018

Monitoring Event	pH	ANZECC pH trigger value - lower bound	ANZECC pH trigger value - upper bound	Unable to Sample
	pH	pH	pH	
7/12/2017	7.90	6.5	8.5	
13/12/2017	7.92	6.5	8.5	
21/12/2017	7.00	6.5	8.5	
28/12/2017	7.99	6.5	8.5	
4/01/2018	8.47	6.5	8.5	
11/01/2018	8.72	6.5	8.5	
18/01/2018	8.96	6.5	8.5	
24/01/2018	8.42	6.5	8.5	
1/02/2018	8.28	6.5	8.5	
8/02/2018	8.70	6.5	8.5	
15/02/2018	8.44	6.5	8.5	
22/02/2018	9.32	6.5	8.5	

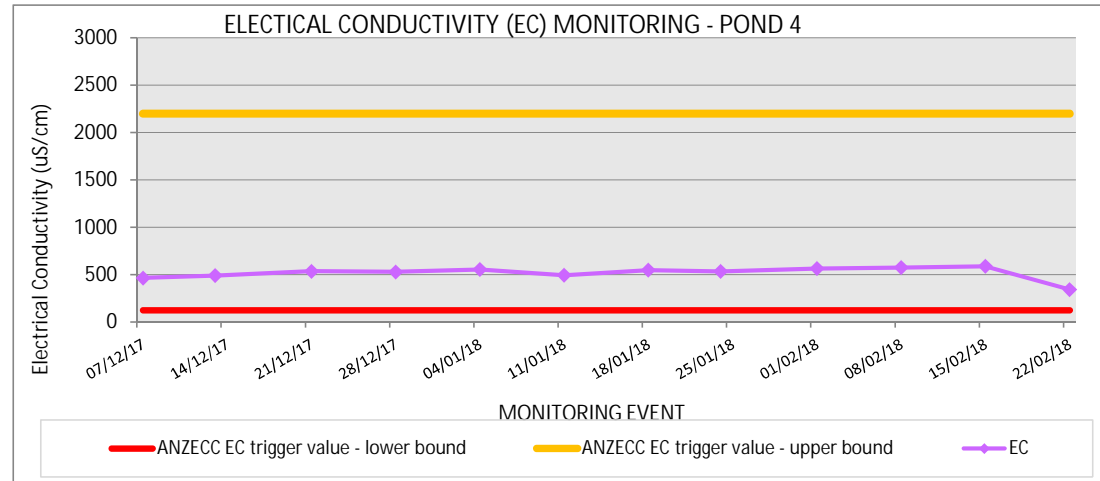
*Bold denotes exceedance



Pond 4 Monitoring Location - Weekly EC Monitoring

Pond 4 - Weekly EC Monitoring
December 2017 to February 2018

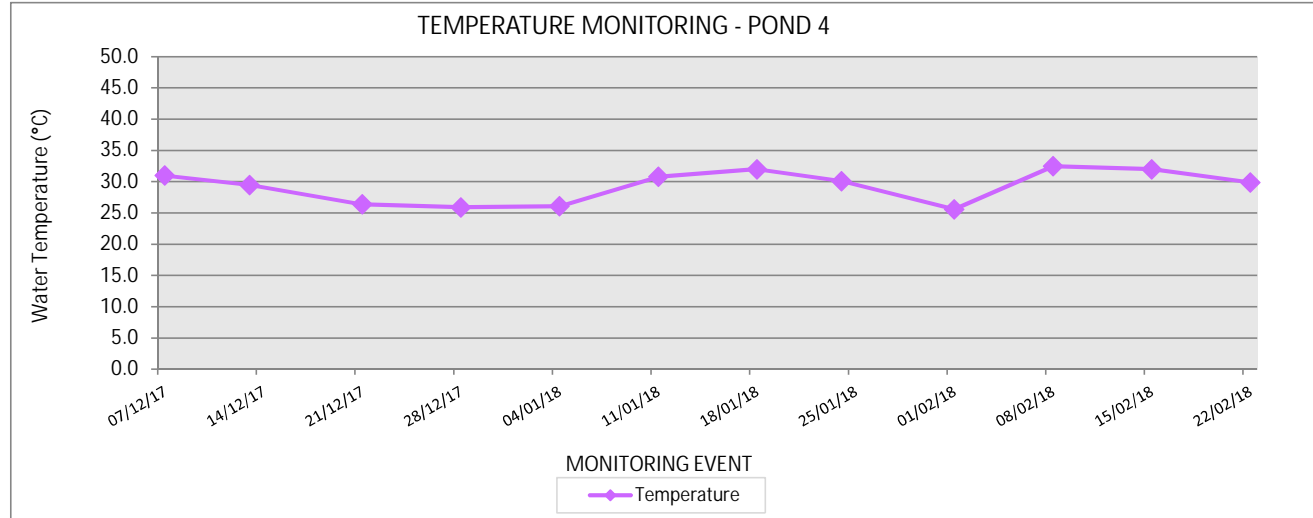
Monitoring Event	EC	ANZECC EC trigger value - lower bound	ANZECC EC trigger value - upper bound	Unable to Sample
	µS/cm	µS/cm	µS/cm	
7/12/2017	466	125	2200	
13/12/2017	490	125	2200	
21/12/2017	536	125	2200	
28/12/2017	529	125	2200	
4/01/2018	555	125	2200	
11/01/2018	494	125	2200	
18/01/2018	548	125	2200	
24/01/2018	534	125	2200	
1/02/2018	565	125	2200	
8/02/2018	575	125	2200	
15/02/2018	589	125	2200	
22/02/2018	344	125	2200	



Pond 4 Monitoring Location - Weekly Temperature Monitoring

Pond 4 - Weekly Temperature Monitoring
December 2017 to February 2018

Monitoring Event	Temperature °C	Unable to Sample
7/12/2017	31.0	
13/12/2017	29.5	
21/12/2017	26.4	
28/12/2017	25.9	
4/01/2018	26.1	
11/01/2018	30.8	
18/01/2018	32.0	
24/01/2018	30.1	
1/02/2018	25.6	
8/02/2018	32.5	
15/02/2018	32.0	
22/02/2018	29.9	

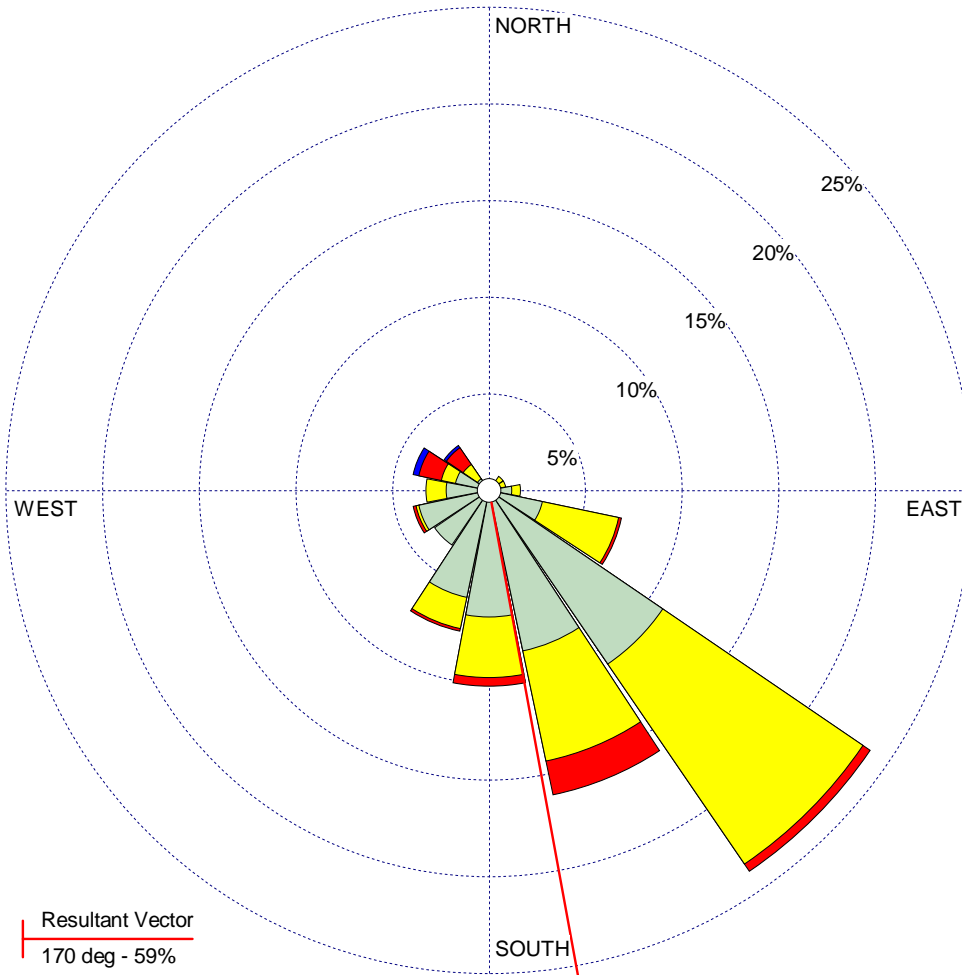


WIND ROSE PLOT:

**NCIA - Meteorological Data
February Sampling Period - February 2018**

DISPLAY:

**Wind Speed
Direction (blowing from)**



WIND SPEED
(m/s)

- >= 11.1
- 8.8 - 11.1
- 5.7 - 8.8
- 3.6 - 5.7
- 2.1 - 3.6
- 0.5 - 2.1

Calms: 13.82%

COMMENTS:

DATA PERIOD:

**Start Date: 1/02/2018 - 00:00
End Date: 28/02/2018 - 23:00**

COMPANY NAME:

MODELER:

CALM WINDS:

13.82%

TOTAL COUNT:

672 hrs.

AVG. WIND SPEED:

1.69 m/s

DATE:

19/03/2018

PROJECT NO.:

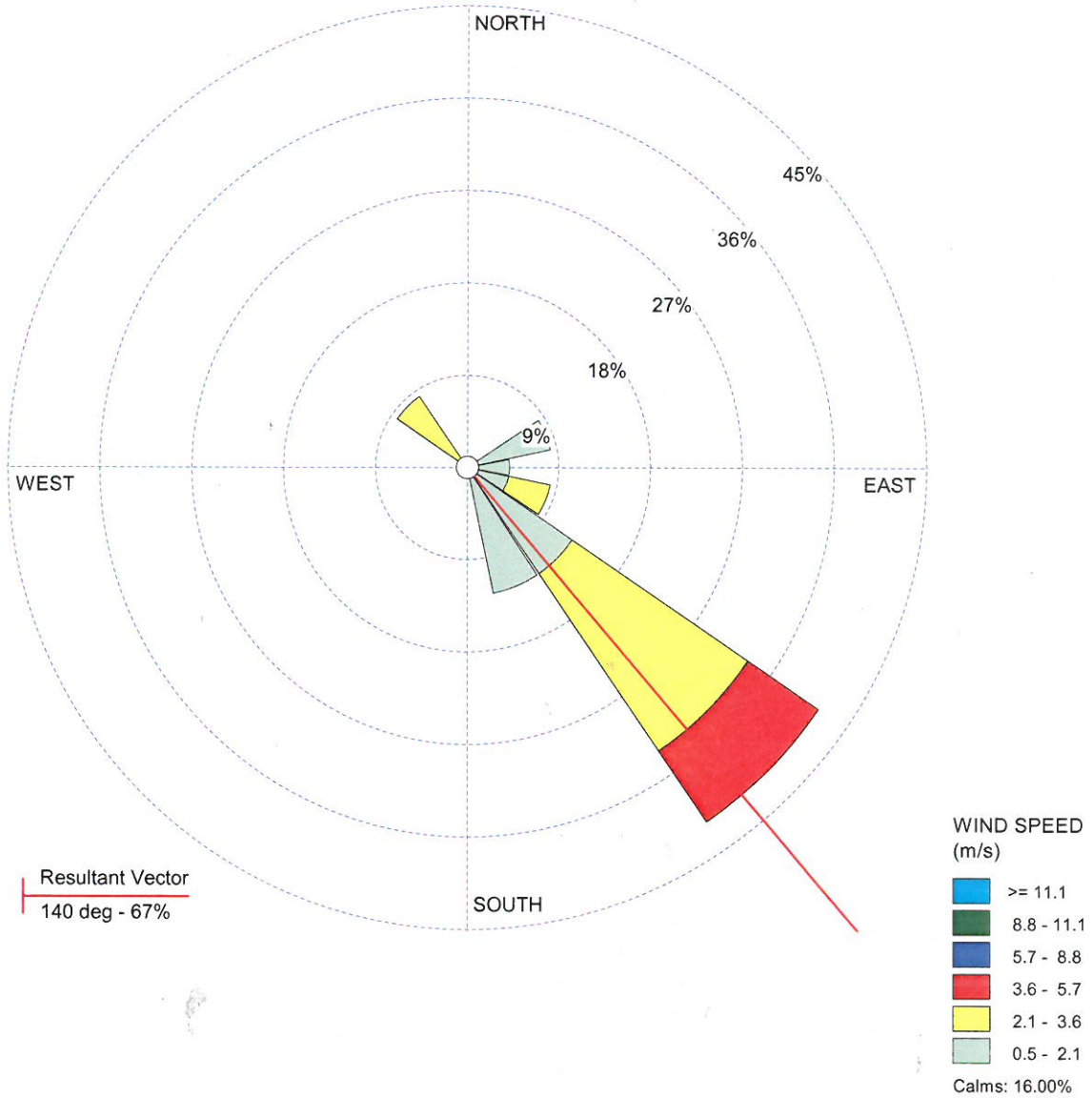
60551495

WIND ROSE PLOT:

**NCIA Meteorology Data
12 February 2018**

DISPLAY:

**Wind Speed
Direction (blowing from)**



COMMENTS:

DATA PERIOD:

**Start Date: 12/02/2018 - 00:00
End Date: 12/02/2018 - 23:00**

COMPANY NAME:

MODELER:

CALM WINDS:

16.00%

TOTAL COUNT:

24 hrs.

AVG. WIND SPEED:

1.76 m/s

DATE:

13/03/2018

PROJECT NO.:

60551495