

3 May 2019

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

Dear Chris,

### **Environmental Monitoring for National Ceramic Industries Australia - March 2019**

Please find enclosed the documentation for the environmental monitoring carried out for National Ceramic Industries Australia during March 2019. 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 (PM<sub>10</sub>) 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 – PM<sub>10</sub> 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 (2016) – *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(R2016) *Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples; and*
  - AS/NZS 5667.4:1998(R2016) *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 PM<sub>10</sub> (particulate matter with an aerodynamic diameter of less than 10 µm) are:

- 50 µg/m<sup>3</sup> over a 24-hour period; and
- 30 µg/m<sup>3</sup> 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/m<sup>3</sup> over a 24-hour period; and
- 1.7 µg/m<sup>3</sup> 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* (ANZG, 2018). 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 March 2019 are presented in the attachments to this letter. Monitoring results for the preceding two months are also presented to demonstrate quarterly trends in results.

March  $\text{PM}_{10}$  monitoring results were below the consent 24-hour criterion of  $50\mu\text{g}/\text{m}^3$

The  $\text{PM}_{10}$  rolling annual average concentration at the South East site remains below the Project Approval annual criterion of  $30\mu\text{g}/\text{m}^3$  with an average of  $21.3\mu\text{g}/\text{m}^3$  recorded. The North West annual average is currently above the criteria. The North West annual average sits at  $31.9\mu\text{g}/\text{m}^3$  following the completion of the March monitoring period. This is primarily due to elevated results recorded during July 2018 and February 2019.

Fluoride results for March 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 ANZG 2018 guidelines for pH and conductivity are the default trigger values for slightly disturbed aquatic ecosystems in NSW lowland rivers. pH measurements on 7 and 14 March were over the ANZG guideline however Pond 4 was not observed to be discharging at these times. All remaining pH and conductivity measurements were within the relevant ANZG guidelines for March. 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 March site visits.

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

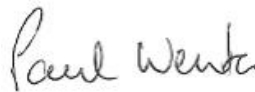
Meteorological data for March has been sourced from the OEH meteorological station in Beresfield after a collection error resulted in no data able to be collected from NCIA's onsite station.

If you require any further information, please contact Simon Murphy on 0428 626 952.

Yours faithfully,



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encl: Monitoring data tables and charts, wind rose

AECOM in Australia and New Zealand is certified to ISO9001, ISO14001 AS/NZS4801 and OHSAS18001.

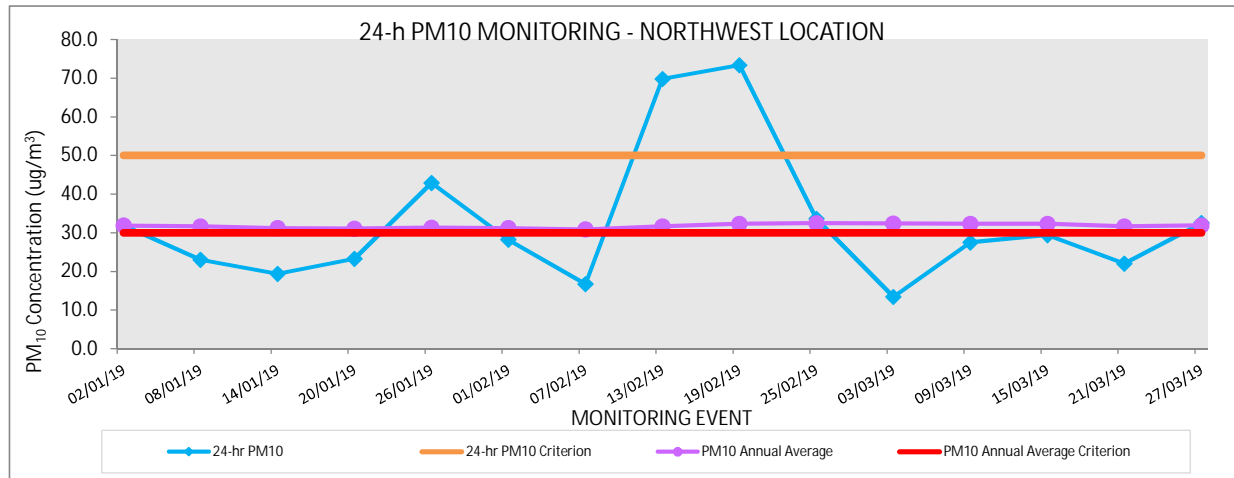
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### North West Monitoring Location - 24 hour PM10 Monitoring

North West - 24 hour PM10 Monitoring				
January 2019 to March 2019				
Monitoring Event	24-hr PM <sub>10</sub>	24-hr PM <sub>10</sub> Criterion	PM <sub>10</sub> Annual Average	PM <sub>10</sub> Annual Average Criterion
	(µg/m <sup>3</sup> )	(µg/m <sup>3</sup> )	(µg/m <sup>3</sup> )	
2-Jan-19	31.9	50	<b>31.8</b>	30
8-Jan-19	23.0	50	<b>31.7</b>	30
14-Jan-19	19.4	50	<b>31.2</b>	30
20-Jan-19	23.3	50	<b>31.1</b>	30
26-Jan-19	42.9	50	<b>31.3</b>	30
1-Feb-19	28.2	50	<b>31.2</b>	30
7-Feb-19	16.7	50	<b>30.9</b>	30
13-Feb-19	<b>69.8</b>	50	<b>31.7</b>	30
19-Feb-19	<b>73.4</b>	50	<b>32.3</b>	30
25-Feb-19	33.6	50	<b>32.4</b>	30
3-Mar-19	13.4	50	<b>32.4</b>	30
9-Mar-19	27.5	50	<b>32.3</b>	30
15-Mar-19	29.4	50	<b>32.3</b>	30
21-Mar-19	22.0	50	<b>31.7</b>	30
27-Mar-19	32.5	50	<b>31.9</b>	30

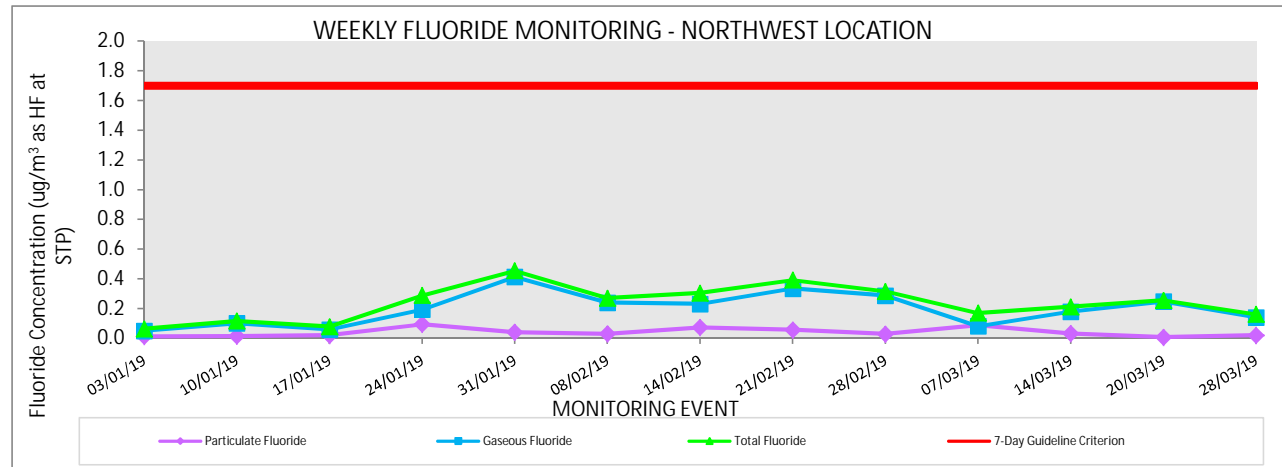
\*Bold denotes exceedance



### North West Monitoring Location - 7 Day Fluoride Monitoring

**North West - 7 Day Fluoride Monitoring**  
January 2019 to March 2019

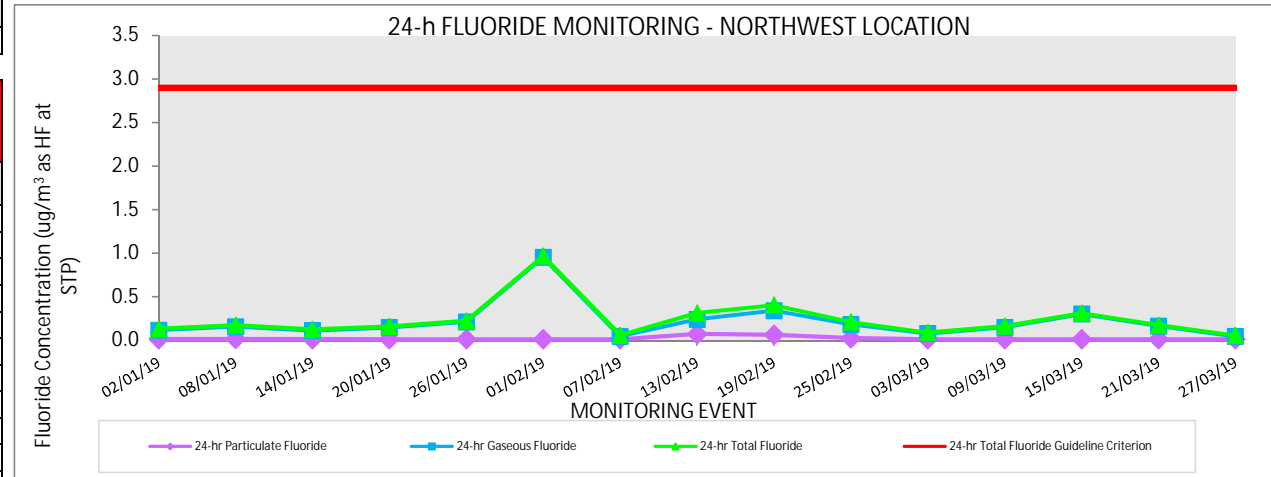
Monitoring Event	Particulate Fluoride	Gaseous Fluoride	Total Fluoride	7-Day Guideline Criterion
	( $\mu\text{g}/\text{m}^3$ as HF at STP)	( $\mu\text{g}/\text{m}^3$ as HF at STP)	( $\mu\text{g}/\text{m}^3$ as HF at STP)	( $\mu\text{g}/\text{m}^3$ as HF at STP)
3-Jan-19	0.013	0.050	0.063	1.7
10-Jan-19	0.015	0.101	0.116	1.7
17-Jan-19	0.020	0.059	0.079	1.7
24-Jan-19	0.095	0.194	0.289	1.7
31-Jan-19	0.041	0.414	0.455	1.7
8-Feb-19	0.030	0.240	0.270	1.7
14-Feb-19	0.073	0.232	0.305	1.7
21-Feb-19	0.057	0.335	0.392	1.7
28-Feb-19	0.029	0.287	0.316	1.7
7-Mar-19	0.088	0.082	0.170	1.7
14-Mar-19	0.032	0.180	0.212	1.7
20-Mar-19	0.007	0.248	0.255	1.7
28-Mar-19	0.020	0.141	0.161	1.7



### North West Monitoring Location - 24 hour Fluoride Monitoring

**North West - 24 hour Fluoride Monitoring**  
January 2019 to March 2019

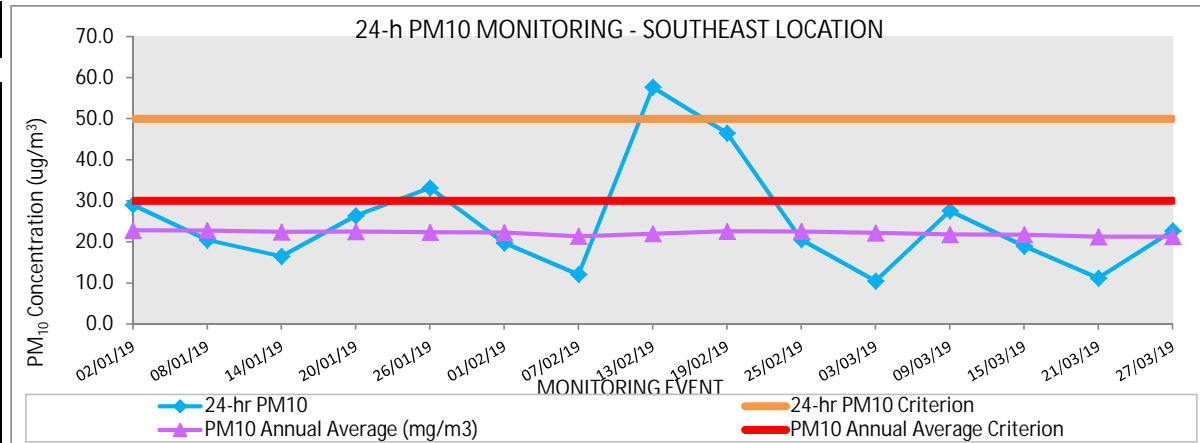
Monitoring Event	24-hr Particulate Fluoride	24-hr Gaseous Fluoride	24-hr Total Fluoride	24-hr Total Fluoride Guideline Criterion
	( $\mu\text{g}/\text{m}^3$ as HF at STP)	( $\mu\text{g}/\text{m}^3$ as HF at STP)	( $\mu\text{g}/\text{m}^3$ as HF at STP)	( $\mu\text{g}/\text{m}^3$ as HF at STP)
2-Jan-19	0.015	0.117	0.132	2.9
8-Jan-19	0.016	0.158	0.174	2.9
14-Jan-19	0.014	0.112	0.126	2.9
20-Jan-19	0.012	0.148	0.160	2.9
26-Jan-19	0.012	0.212	0.224	2.9
1-Feb-19	0.012	0.955	0.967	2.9
7-Feb-19	0.012	0.047	0.059	2.9
13-Feb-19	0.073	0.242	0.315	2.9
19-Feb-19	0.063	0.342	0.405	2.9
25-Feb-19	0.026	0.184	0.210	2.9
3-Mar-19	0.012	0.078	0.090	2.9
9-Mar-19	0.012	0.151	0.163	2.9
15-Mar-19	0.012	0.302	0.314	2.9
21-Mar-19	0.012	0.164	0.176	2.9
27-Mar-19	0.012	0.045	0.057	2.9



### South East Monitoring Location - 24 hour PM10 Monitoring

**South East - 24 hour PM10 Monitoring**  
January 2019 to March 2019

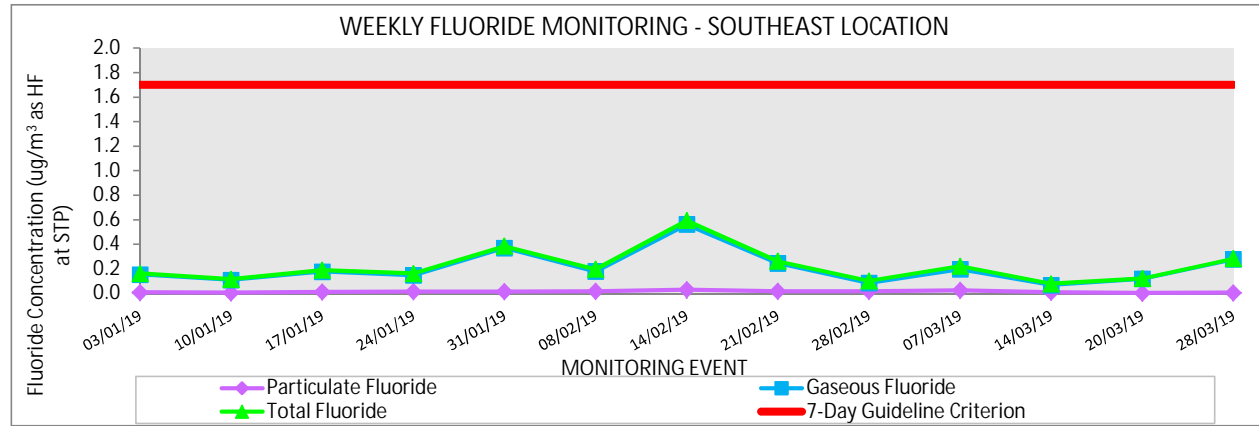
Monitoring Event	24-hr PM <sub>10</sub>	24-hr PM <sub>10</sub> Criterion	PM <sub>10</sub> Annual Average	PM <sub>10</sub> Annual Average Criterion
	(µg/m <sup>3</sup> )	(µg/m <sup>3</sup> )	(µg/m <sup>3</sup> )	
2-Jan-19	29.0	50	22.8	30
8-Jan-19	20.5	50	22.8	30
14-Jan-19	16.5	50	22.5	30
20-Jan-19	26.4	50	22.5	30
26-Jan-19	33.2	50	22.3	30
1-Feb-19	19.8	50	22.3	30
7-Feb-19	12.1	50	21.4	30
13-Feb-19	<b>57.7</b>	50	22.0	30
19-Feb-19	46.5	50	22.6	30
25-Feb-19	20.6	50	22.6	30
3-Mar-19	10.5	50	22.2	30
9-Mar-19	27.6	50	21.8	30
15-Mar-19	19.0	50	21.8	30
21-Mar-19	11.2	50	21.2	30
27-Mar-19	22.7	50	21.3	30



### South East Monitoring Location - 7 Day Fluoride Monitoring

**South East - 7 Day Fluoride Monitoring**  
January 2019 to March 2019

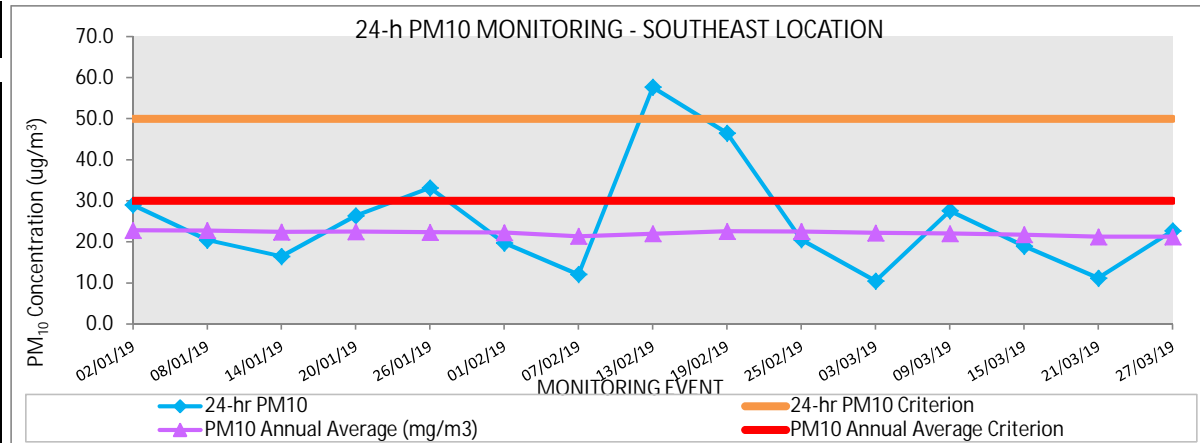
Monitoring Event	Particulate Fluoride	Gaseous Fluoride	Total Fluoride	7-Day Guideline Criterion
	( $\mu\text{g}/\text{m}^3$ as HF at STP)	( $\mu\text{g}/\text{m}^3$ as HF at STP)	( $\mu\text{g}/\text{m}^3$ as HF at STP)	( $\mu\text{g}/\text{m}^3$ as HF at STP)
3-Jan-19	0.008	0.155	0.163	1.7
10-Jan-19	0.006	0.110	0.116	1.7
17-Jan-19	0.012	0.178	0.190	1.7
24-Jan-19	0.015	0.148	0.163	1.7
31-Jan-19	0.015	0.371	0.386	1.7
8-Feb-19	0.018	0.179	0.197	1.7
14-Feb-19	0.031	0.563	0.594	1.7
21-Feb-19	0.017	0.246	0.263	1.7
28-Feb-19	0.017	0.085	0.102	1.7
7-Mar-19	0.026	0.197	0.223	1.7
14-Mar-19	0.010	0.069	0.079	1.7
20-Mar-19	0.003	0.119	0.122	1.7
28-Mar-19	0.006	0.278	0.284	1.7



### South East Monitoring Location - 24 hour PM10 Monitoring

**South East - 24 hour PM10 Monitoring**  
January 2019 to March 2019

Monitoring Event	24-hr PM <sub>10</sub>	24-hr PM <sub>10</sub> Criterion	PM <sub>10</sub> Annual Average	PM <sub>10</sub> Annual Average Criterion
	(µg/m <sup>3</sup> )	(µg/m <sup>3</sup> )	(µg/m <sup>3</sup> )	
2-Jan-19	29.0	50	22.8	30
8-Jan-19	20.5	50	22.8	30
14-Jan-19	16.5	50	22.5	30
20-Jan-19	26.4	50	22.5	30
26-Jan-19	33.2	50	22.3	30
1-Feb-19	19.8	50	22.3	30
7-Feb-19	12.1	50	21.4	30
13-Feb-19	<b>57.7</b>	50	22.0	30
19-Feb-19	46.5	50	22.6	30
25-Feb-19	20.6	50	22.6	30
3-Mar-19	10.5	50	22.2	30
9-Mar-19	27.6	50	22.1	30
15-Mar-19	19.0	50	21.8	30
21-Mar-19	11.2	50	21.2	30
27-Mar-19	22.7	50	21.3	30

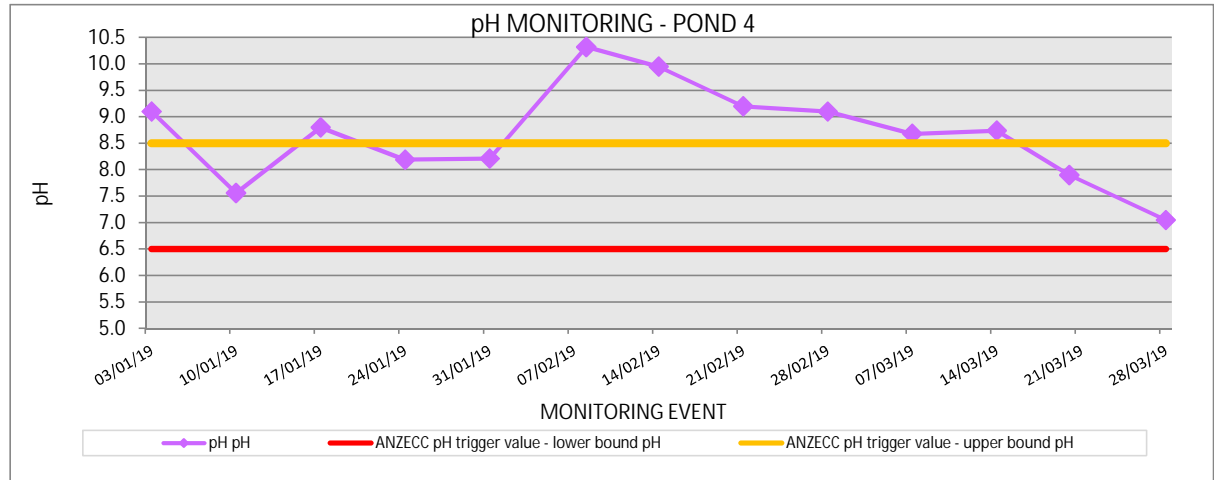




### Pond 4 Monitoring Location - Weekly pH Monitoring

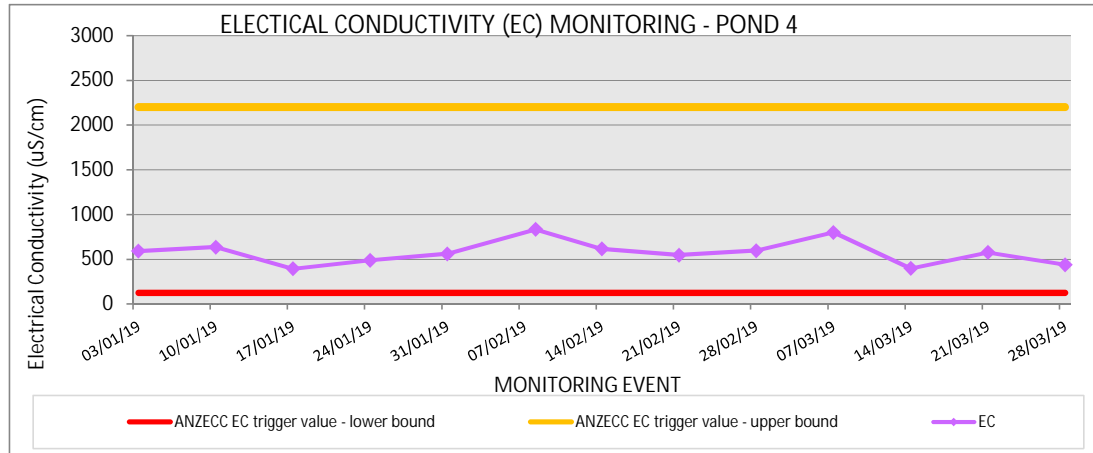
**Pond 4 - Weekly pH Monitoring**  
January 2019 to March 2019

Monitoring Event	pH	ANZECC pH trigger value - lower bound	ANZECC pH trigger value - upper bound	Unable to Sample
	pH	pH	pH	
3/01/2019	9.10	6.5	8.5	
10/01/2019	7.56	6.5	8.5	
17/01/2019	8.80	6.5	8.5	
24/01/2019	8.19	6.5	8.5	
31/01/2019	8.21	6.5	8.5	
8/02/2019	10.32	6.5	8.5	
14/02/2019	9.95	6.5	8.5	
21/02/2019	9.20	6.5	8.5	
28/02/2019	9.10	6.5	8.5	
7/03/2019	8.68	6.5	8.5	
14/03/2019	8.74	6.5	8.5	
20/03/2019	7.90	6.5	8.5	
28/03/2019	7.05	6.5	8.5	



### Pond 4 Monitoring Location - Weekly EC Monitoring

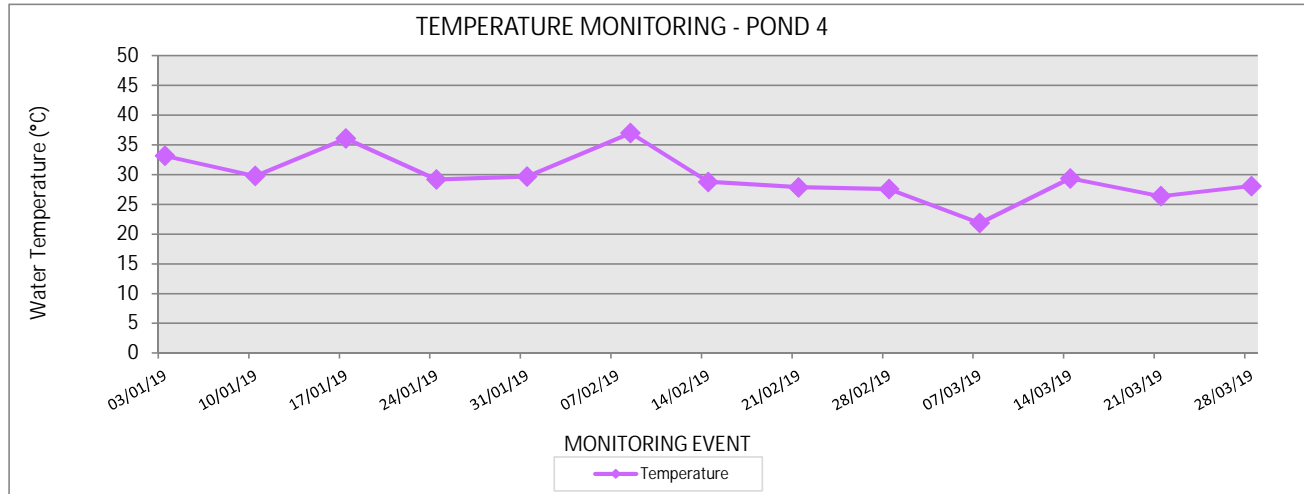
Pond 4 - Weekly EC Monitoring				
January 2019 to March 2019				
Monitoring Event	EC	ANZECC EC trigger value - lower bound	ANZECC EC trigger value - upper bound	Unable to Sample
	µS/cm	µS/cm	µS/cm	
3/01/2019	593	125	2200	
10/01/2019	637	125	2200	
17/01/2019	396	125	2200	
24/01/2019	491	125	2200	
31/01/2019	563	125	2200	
8/02/2019	836	125	2200	
14/02/2019	618	125	2200	
21/02/2019	547	125	2200	
28/02/2019	598	125	2200	
7/03/2019	802	125	2200	
14/03/2019	399	125	2200	
21/03/2019	578	125	2200	
28/03/2019	440	125	2200	



### Pond 4 Monitoring Location - Weekly Temperature Monitoring

**Pond 4 - Weekly Temperature Monitoring**  
January 2019 to March 2019

Monitoring Event	Temperature °C	Unable to Sample
3/01/2019	33.2	
10/01/2019	29.8	
17/01/2019	36.1	
24/01/2019	29.2	
31/01/2019	29.7	
8/02/2019	37.0	
14/02/2019	28.8	
21/02/2019	27.9	
28/02/2019	27.6	
7/03/2019	21.9	
14/03/2019	29.4	
21/03/2019	26.4	
28/03/2019	28.1	

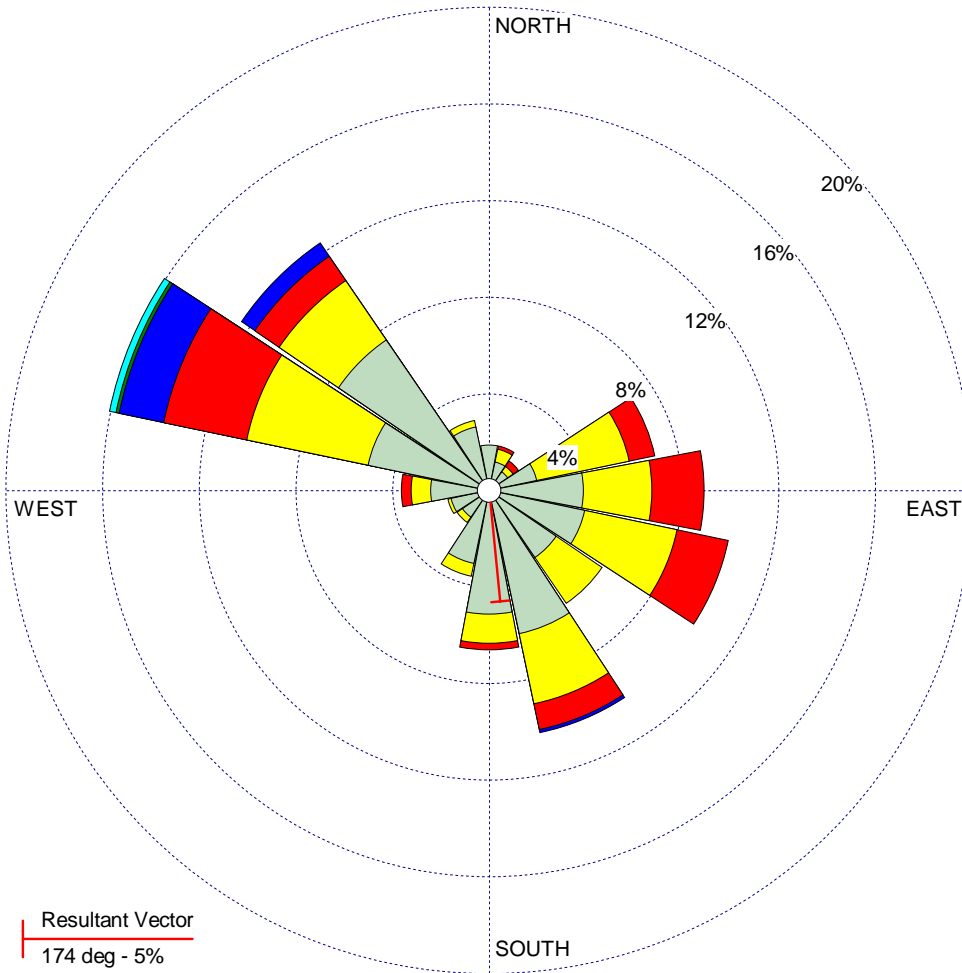


WIND ROSE PLOT:

**NCIA - Meteorological Data**  
**March Sampling Period: March 2019**

DISPLAY:

**Wind Speed**  
**Direction (blowing from)**



Resultant Vector  
 174 deg - 5%

**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: 4.31%

COMMENTS:

DATA PERIOD:

**Start Date: 1/03/2019 - 01:00**  
**End Date: 31/03/2019 - 23:00**

COMPANY NAME:

MODELER:

CALM WINDS:

**4.31%**

TOTAL COUNT:

**743 hrs.**

AVG. WIND SPEED:

**2.16 m/s**

DATE:

**3/05/2019**

PROJECT NO.:

**60583731**