

24 April 2020

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

Dear Chris,

### **Environmental Monitoring for National Ceramic Industries Australia - March 2020**

Please find enclosed the documentation for the environmental monitoring carried out for National Ceramic Industries Australia during March 2020. 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 2020 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 March 2020 monitoring results show that all ambient  $\text{PM}_{10}$  results were below the short-term impact assessment criterion ( $50\mu\text{g}/\text{m}^3$ ) as defined in the DPIE Project Approval (Schedule 3, Condition 15, Table 2).

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  $24.2\mu\text{g}/\text{m}^3$  following the March monitoring period. The North West annual average is currently above the criteria at  $35.9\mu\text{g}/\text{m}^3$  following the completion of the March monitoring period, largely due to elevated results recorded during November and December 2019 caused by regional heavy bushfire smoke.

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 South East 7 day Fluoride sample commencing 19 March failed to run correctly and was not analysed.

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 for March were recorded within the ANZG guidelines except for the measurement taken on 19 March which was above the 8.5 upper limit. Importantly, Pond 4 was not observed to be discharging on this day. All conductivity measurements were within the relevant ANZG guidelines for March. Water temperature was also measured weekly however no guideline is available for assessment.

The monitoring locations, 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.

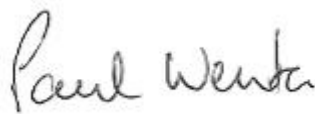
If you require any further information, please contact Cyé Buckland on 0488 777 160.

Yours faithfully,



Cyé Buckland  
Senior Environmental Technician  
cye.buckland@aecom.com

Direct Dial: +61 2 4911 4829  
Direct Fax: +61 2 4911 4999



Paul Wenta  
Principal Scientist - Air Quality  
paul.wenta@aecom.com

Mobile: +61 438 670 281  
Direct Dial: +61 2 4911 4855  
Direct Fax: +61 2 4911 4999

encl: Monitoring data tables and charts, monitoring locations, wind roses

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

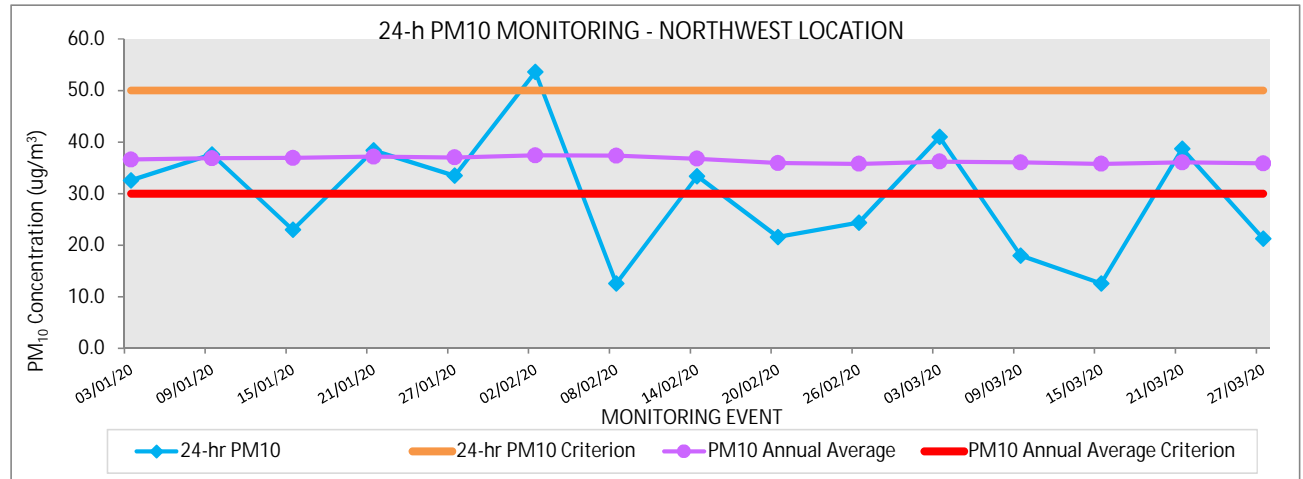
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### North West Monitoring Location - 24 hour PM10 Monitoring

North West - 24 hour PM10 Monitoring				
January 2020 to March 2020				
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> )	
3-Jan-20	32.6	50	<b>36.6</b>	30
9-Jan-20	37.6	50	<b>36.9</b>	30
15-Jan-20	23.0	50	<b>36.9</b>	30
21-Jan-20	38.4	50	<b>37.2</b>	30
27-Jan-20	33.5	50	<b>37.0</b>	30
2-Feb-20	<b>53.6</b>	50	<b>37.4</b>	30
8-Feb-20	12.6	50	<b>37.4</b>	30
14-Feb-20	33.4	50	<b>36.8</b>	30
20-Feb-20	21.6	50	<b>35.9</b>	30
26-Feb-20	24.4	50	<b>35.8</b>	30
3-Mar-20	41.0	50	<b>36.2</b>	30
9-Mar-20	18.0	50	<b>36.1</b>	30
15-Mar-20	12.6	50	<b>35.8</b>	30
21-Mar-20	38.7	50	<b>36.1</b>	30
27-Mar-20	21.3	50	<b>35.9</b>	30

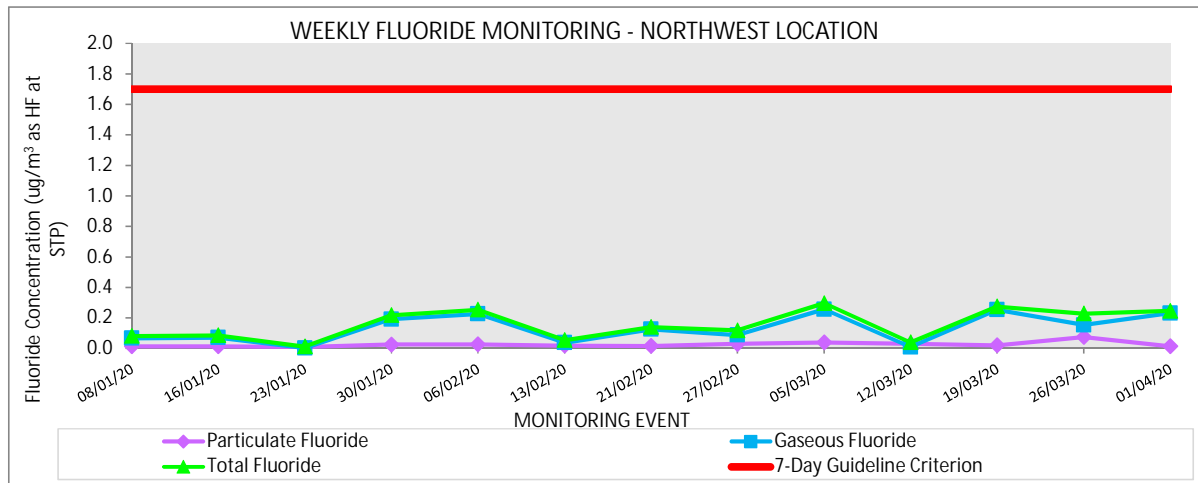
\*Bold denotes exceedance



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

**North West - 7 Day Fluoride Monitoring**  
January 2020 to March 2020

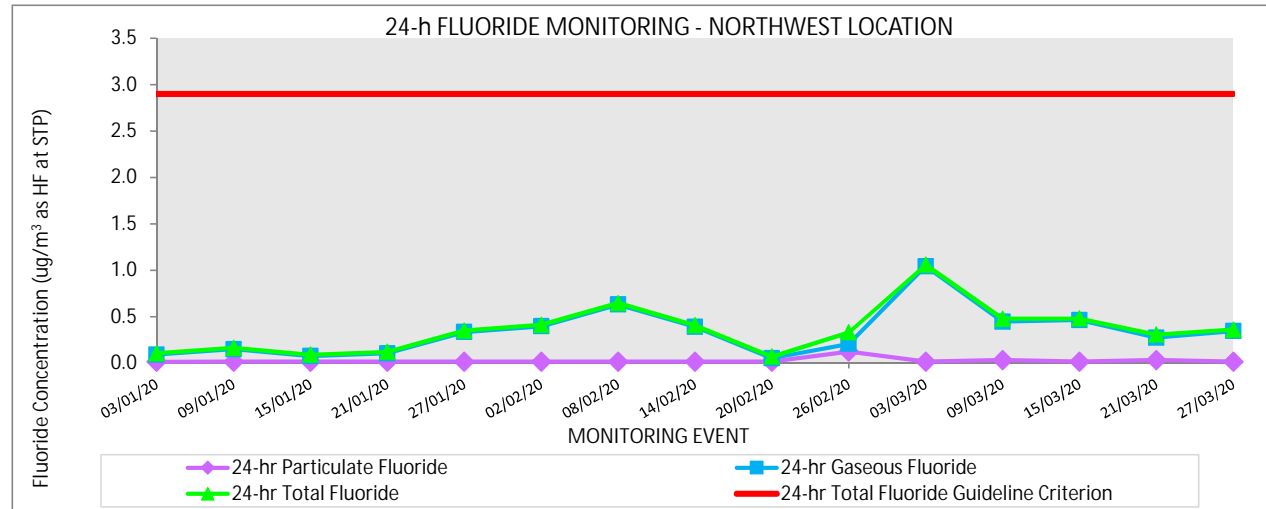
Monitoring Event		Particulate Fluoride	Gaseous Fluoride	Total Fluoride	7-Day Guideline Criterion
Start Date	End Date	( $\mu\text{g}/\text{m}^3$ as HF at STP)	( $\mu\text{g}/\text{m}^3$ as HF at STP)	( $\mu\text{g}/\text{m}^3$ as HF at STP)	( $\mu\text{g}/\text{m}^3$ as HF at STP)
2-Jan-20	8-Jan-20	0.014	0.067	0.081	1.7
8-Jan-20	16-Jan-20	0.015	0.071	0.086	1.7
16-Jan-20	23-Jan-20	0.010	0.002	0.012	1.7
23-Jan-20	30-Jan-20	0.026	0.192	0.218	1.7
30-Jan-20	6-Feb-20	0.027	0.227	0.254	1.7
6-Feb-20	13-Feb-20	0.018	0.037	0.055	1.7
13-Feb-20	21-Feb-20	0.016	0.125	0.141	1.7
21-Feb-20	27-Feb-20	0.030	0.088	0.118	1.7
27-Feb-20	5-Mar-20	0.040	0.257	0.297	1.7
5-Mar-20	12-Mar-20	0.030	0.009	0.039	1.7
12-Mar-20	19-Mar-20	0.021	0.254	0.275	1.7
19-Mar-20	26-Mar-20	0.075	0.154	0.229	1.7
26-Mar-20	1-Apr-20	0.014	0.232	0.246	1.7



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

**North West - 24 hour Fluoride Monitoring**  
January 2020 to March 2020

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)
3-Jan-20	0.013	0.092	0.105	2.9
9-Jan-20	0.015	0.149	0.164	2.9
15-Jan-20	0.015	0.075	0.090	2.9
21-Jan-20	0.015	0.105	0.120	2.9
27-Jan-20	0.015	0.334	0.349	2.9
2-Feb-20	0.016	0.396	0.412	2.9
8-Feb-20	0.015	0.631	0.646	2.9
14-Feb-20	0.015	0.392	0.407	2.9
20-Feb-20	0.016	0.052	0.068	2.9
26-Feb-20	0.124	0.207	0.331	2.9
3-Mar-20	0.015	1.043	1.058	2.9
9-Mar-20	0.032	0.446	0.478	2.9
15-Mar-20	0.016	0.463	0.479	2.9
21-Mar-20	0.033	0.273	0.306	2.9
27-Mar-20	0.016	0.345	0.361	2.9

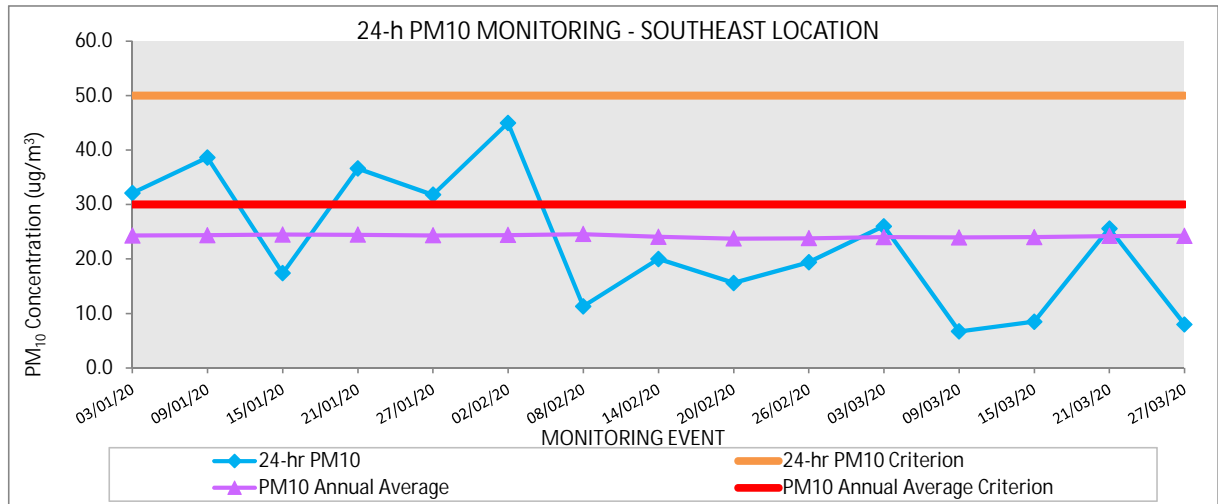


### South East Monitoring Location - 24 hour PM10 Monitoring

**South East - 24 hour PM10 Monitoring**  
January 2020 to March 2020

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> )	
03-Jan-20	32.1	50	24.3	30
09-Jan-20	38.6	50	24.4	30
15-Jan-20	17.4	50	24.5	30
21-Jan-20	36.6	50	24.4	30
27-Jan-20	31.8	50	24.3	30
02-Feb-20	45.0	50	24.4	30
08-Feb-20	11.3	50	24.6	30
14-Feb-20	20.0	50	24.1	30
20-Feb-20	15.6	50	23.7	30
26-Feb-20	19.4	50	23.8	30
03-Mar-20	26.0	50	24.0	30
09-Mar-20	6.7	50	23.9	30
15-Mar-20	8.5	50	24.0	30
21-Mar-20	25.6	50	24.2	30
27-Mar-20	8.0	50	24.2	30

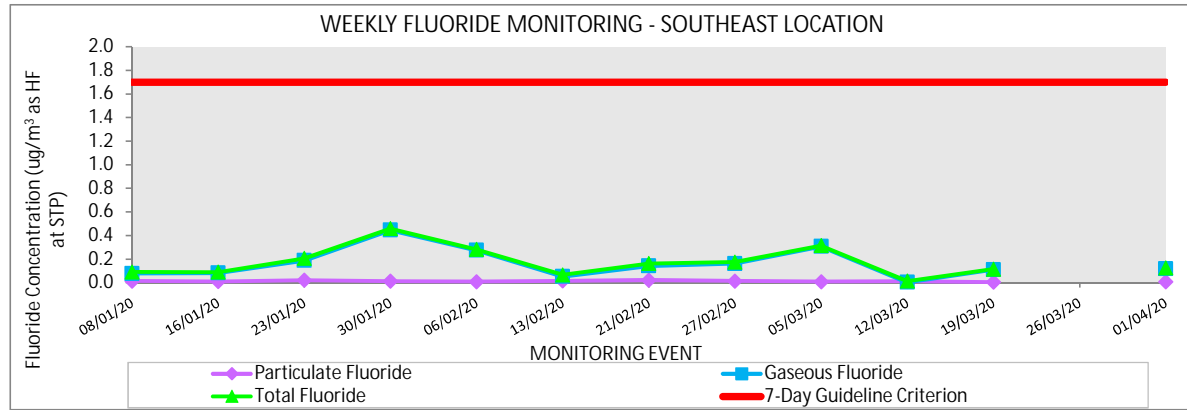
**Bold denotes exceedance**



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

#### South East - 7 Day Fluoride Monitoring January 2020 to March 2020

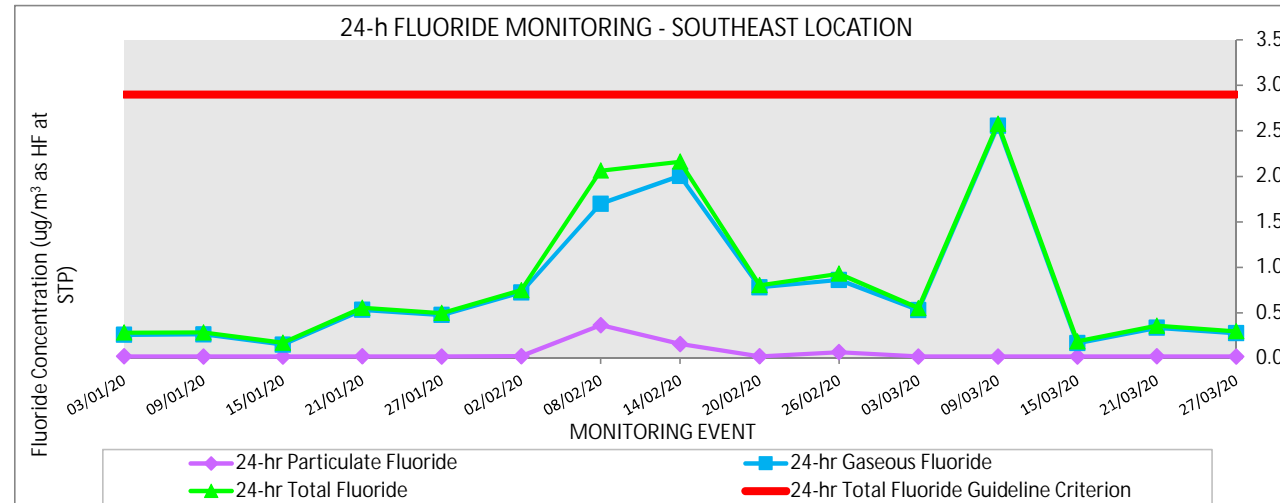
Monitoring Event		Particulate Fluoride	Gaseous Fluoride	Total Fluoride	7-Day Guideline Criterion
Start Date	End Date	( $\mu\text{g}/\text{m}^3$ as HF at STP)	( $\mu\text{g}/\text{m}^3$ as HF at STP)	( $\mu\text{g}/\text{m}^3$ as HF at STP)	( $\mu\text{g}/\text{m}^3$ as HF at STP)
2-Jan-20	8-Jan-20	0.014	0.076	0.090	1.7
8-Jan-20	16-Jan-20	0.009	0.080	0.089	1.7
16-Jan-20	23-Jan-20	0.020	0.185	0.205	1.7
23-Jan-20	30-Jan-20	0.013	0.444	0.457	1.7
30-Jan-20	6-Feb-20	0.008	0.272	0.280	1.7
6-Feb-20	13-Feb-20	0.015	0.050	0.065	1.7
13-Feb-20	21-Feb-20	0.022	0.140	0.162	1.7
21-Feb-20	27-Feb-20	0.014	0.160	0.174	1.7
27-Feb-20	5-Mar-20	0.008	0.306	0.314	1.7
5-Mar-20	12-Mar-20	0.011	0.002	0.013	1.7
12-Mar-20	19-Mar-20	0.005	0.109	0.114	1.7
19-Mar-20	26-Mar-20				1.7
26-Mar-20	1-Apr-20	0.006	0.117	0.123	1.7



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

#### South East - 24 hour Fluoride Monitoring January 2020 to March 2020

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)
3-Jan-20	0.023	0.259	0.282	2.9
9-Jan-20	0.021	0.264	0.285	2.9
15-Jan-20	0.020	0.151	0.171	2.9
21-Jan-20	0.022	0.533	0.555	2.9
27-Jan-20	0.021	0.476	0.497	2.9
2-Feb-20	0.024	0.725	0.749	2.9
8-Feb-20	0.365	1.698	2.063	2.9
14-Feb-20	0.158	2.004	2.162	2.9
20-Feb-20	0.023	0.780	0.803	2.9
26-Feb-20	0.069	0.861	0.930	2.9
3-Mar-20	0.021	0.531	0.552	2.9
9-Mar-20	0.021	2.557	2.578	2.9
15-Mar-20	0.021	0.166	0.187	2.9
21-Mar-20	0.022	0.336	0.358	2.9
27-Mar-20	0.021	0.276	0.297	2.9



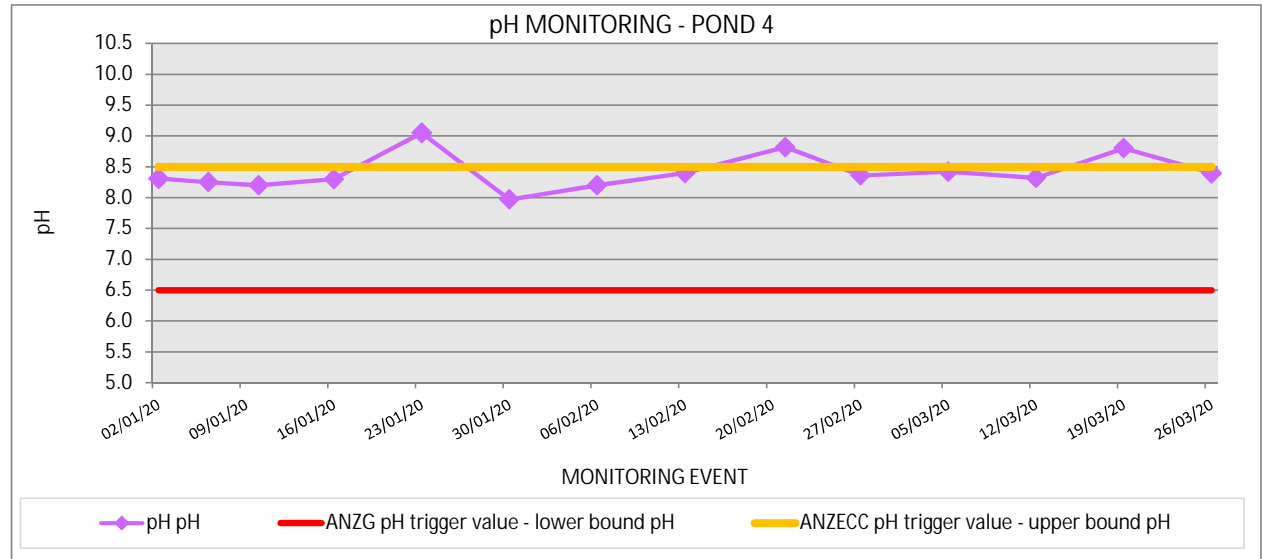


### Pond 4 Monitoring Location - Weekly pH Monitoring

**Pond 4 - Weekly pH Monitoring**  
January 2020 to March 2020

Monitoring Event	pH	ANZG pH trigger value - lower bound	ANZECC pH trigger value - upper bound	Unable to Sample
	pH	pH	pH	
2-Jan-20	8.31	6.5	8.5	
6-Jan-20	8.25	6.5	8.5	
10-Jan-20	8.20	6.5	8.5	
16-Jan-20	8.30	6.5	8.5	
23-Jan-20	<b>9.05</b>	6.5	8.5	
30-Jan-20	7.97	6.5	8.5	
6-Feb-20	8.20	6.5	8.5	
13-Feb-20	8.40	6.5	8.5	
21-Feb-20	<b>8.82</b>	6.5	8.5	
27-Feb-20	8.36	6.5	8.5	
5-Mar-20	8.42	6.5	8.5	
12-Mar-20	8.32	6.5	8.5	
19-Mar-20	<b>8.80</b>	6.5	8.5	
26-Mar-20	8.40	6.5	8.5	

**Bold** denotes guideline exceedance

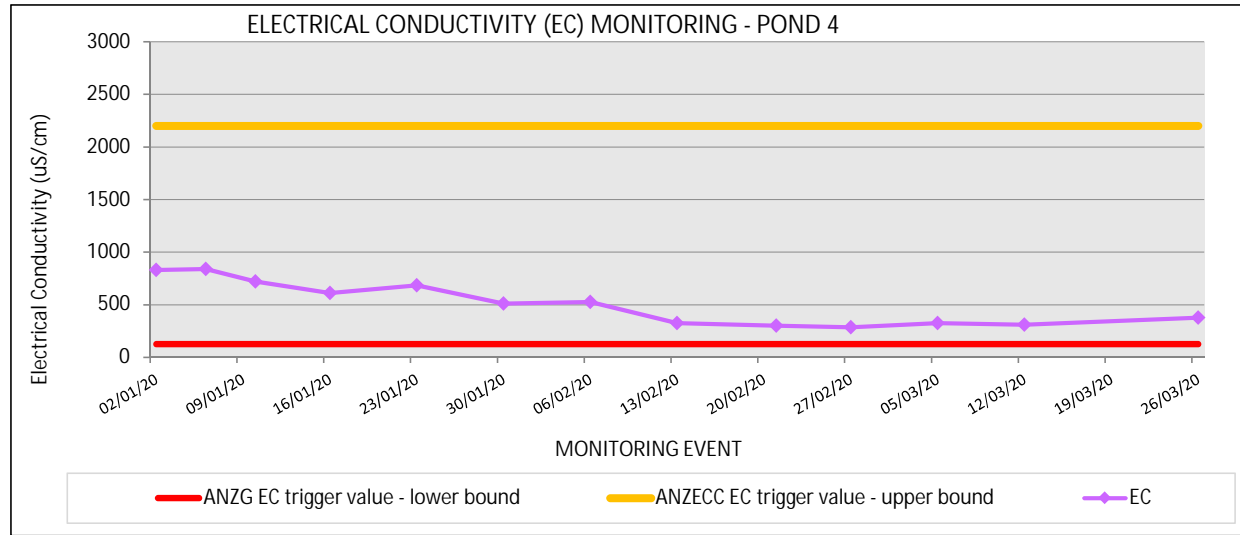


### Pond 4 Monitoring Location - Weekly EC Monitoring

**Pond 4 - Weekly EC Monitoring**  
January 2020 to March 2020

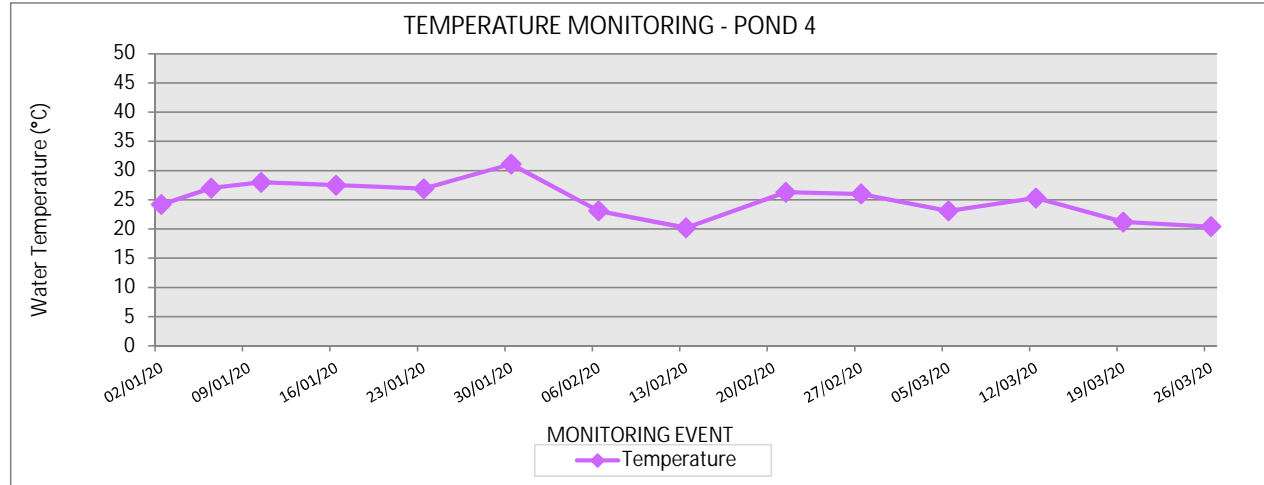
Monitoring Event	EC	ANZG EC trigger value - lower bound	ANZECC EC trigger value - upper bound	Unable to Sample
	µS/cm	µS/cm	µS/cm	
2-Jan-20	832	125	2200	
6-Jan-20	840	125	2200	
10-Jan-20	721	125	2200	
16-Jan-20	613	125	2200	
23-Jan-20	686	125	2200	
30-Jan-20	511	125	2200	
6-Feb-20	527	125	2200	
13-Feb-20	327	125	2200	
21-Feb-20	300	125	2200	
27-Feb-20	287	125	2200	
5-Mar-20	327	125	2200	
12-Mar-20	312	125	2200	
19-Mar-20		125	2200	
26-Mar-20	379	125	2200	

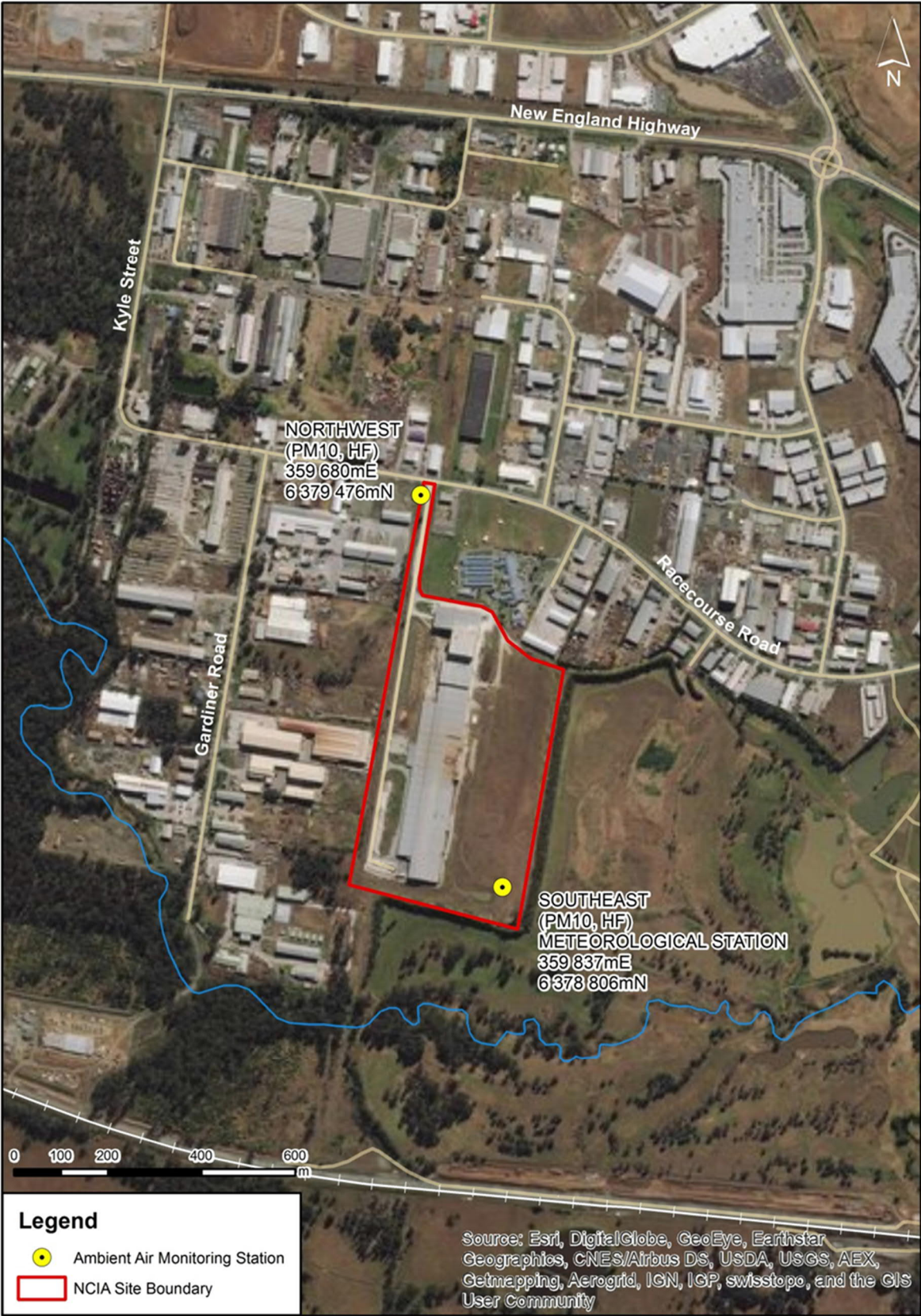
Note: 19 March EC result deemed erroneous



### Pond 4 Monitoring Location - Weekly Temperature Monitoring

Pond 4 - Weekly Temperature Monitoring		
January 2020 to March 2020		
Monitoring Event	Temperature °C	Unable to Sample
2-Jan-20	24.2	
6-Jan-20	27.0	
10-Jan-20	28.0	
16-Jan-20	27.5	
23-Jan-20	26.9	
30-Jan-20	31.1	
6-Feb-20	23.1	
13-Feb-20	20.2	
21-Feb-20	26.3	
27-Feb-20	26.0	
5-Mar-20	23.1	
12-Mar-20	25.3	
19-Mar-20	21.2	
26-Mar-20	20.4	



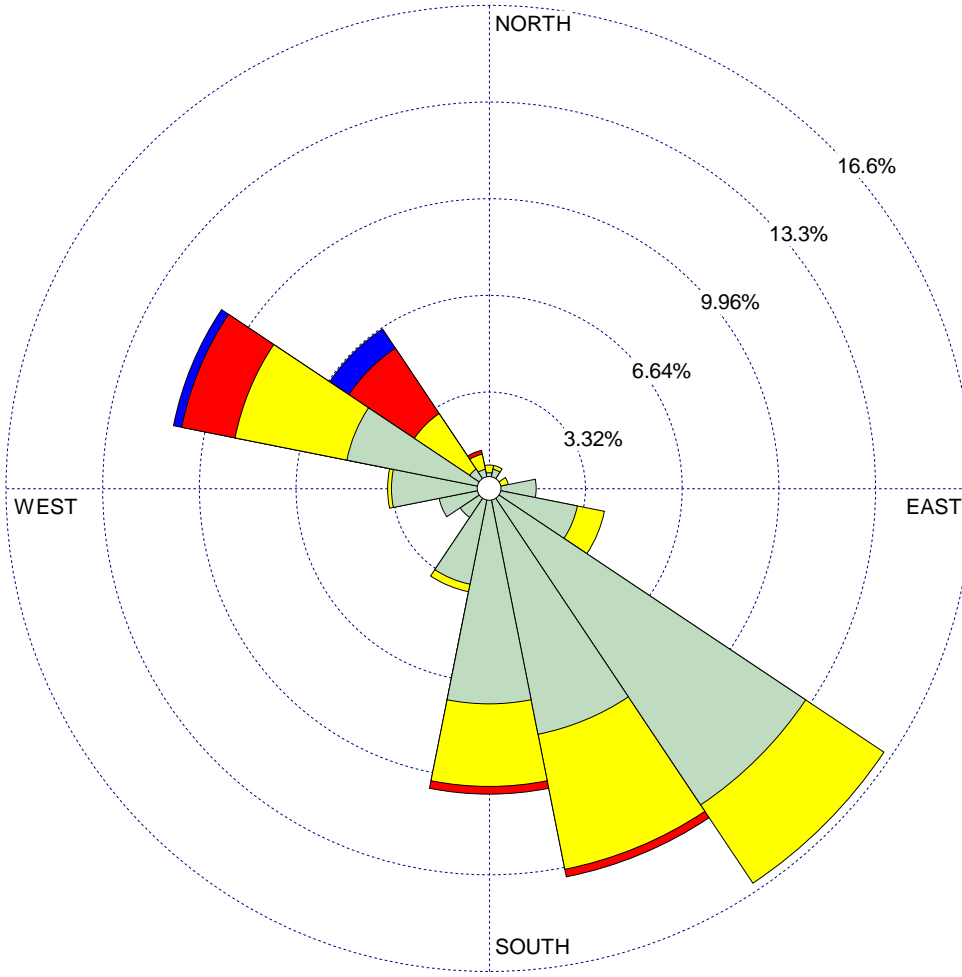


WIND ROSE PLOT:

**NCIA Meteorology Data  
March 2020**

DISPLAY:

**Wind Speed  
Direction (blowing from)**



**WIND SPEED  
(m/s)**

- $\geq 11.10$
  - 8.80 - 11.10
  - 5.70 - 8.80
  - 3.60 - 5.70
  - 2.10 - 3.60
  - 0.50 - 2.10
- Calms: 21.37%

COMMENTS:

DATA PERIOD:

**Start Date: 1/03/2020 - 00:00  
End Date: 31/03/2020 - 23:00**

COMPANY NAME:

MODELER:

CALM WINDS:

**21.37%**

TOTAL COUNT:

**736 hrs.**

AVG. WIND SPEED:

**1.46 m/s**

DATE:

**21/04/2020**

PROJECT NO.:

**60613063**