

15 January 2021

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

Dear Chris,

Environmental Monitoring for National Ceramic Industries Australia - December 2020

Please find enclosed the documentation for the environmental monitoring carried out for National Ceramic Industries Australia during December 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 were 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 (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 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* (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 µS/cm (Table 3.3.3 - NSW Lowland River).

3.0 Monitoring Results

Monitoring results for the month of December 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 December 2020 monitoring results show that all ambient PM₁₀ results were below the short-term impact assessment criterion (50 µg/m³) as defined in the DPIE Project Approval (Schedule 3, Condition 15, Table 2).

The PM₁₀ rolling annual average concentration at the South East site remains below the Project Approval annual criterion of 30 µg/m³ with an average of 17.6 µg/m³ following the December monitoring period. The North West annual average is also below the criteria and is sitting at 26.0 µg/m³ following the completion of the December monitoring period.

Fluoride results for December 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 for December were recorded above the ANZG guideline 8.5 upper limit on three occasions (3, 9 and 30 December). Pond 4 was not observed to be flowing offsite on any of these occasions.

All conductivity measurements were within the relevant ANZG guidelines for December. Water temperature was also measured weekly however no guideline is available for assessment.

A figure showing the monitoring locations and monitoring results and plots can be found attached along with the wind rose for December. Laboratory certificates, field sheets and calibration data along with relevant meteorology data can be provided on request.

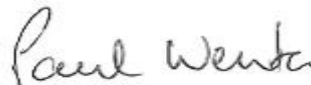
If you require any further information, please contact Cyé Buckland on 0488 777 160.

Yours faithfully,



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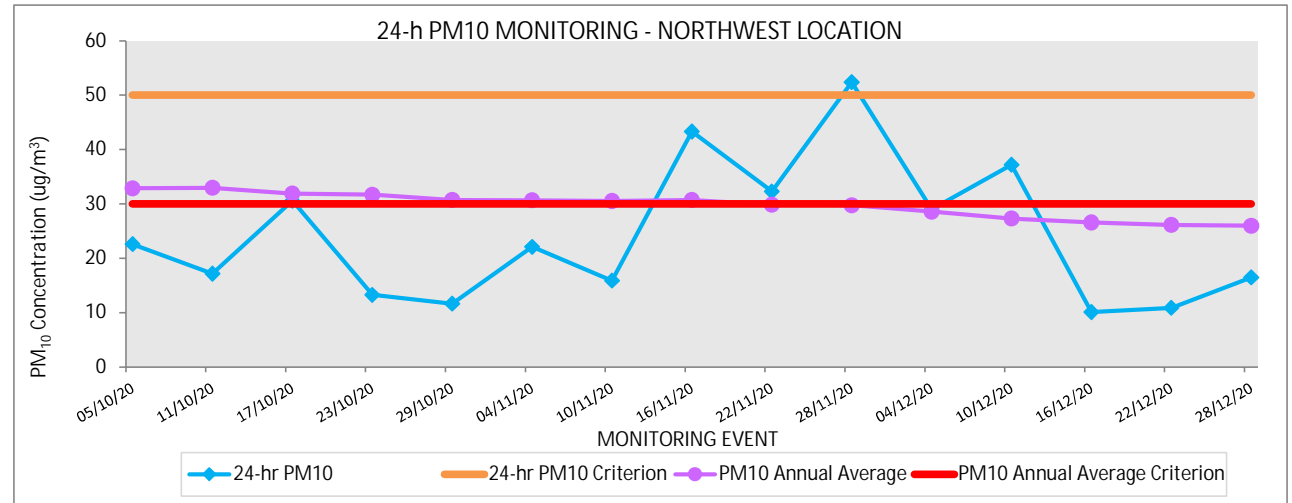
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encl: Monitoring data tables and charts, monitoring locations, wind roses

North West Monitoring Location - 24 hour PM10 Monitoring

North West - 24 hour PM10 Monitoring				
October 2020 to December 2020				
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)	
5-Oct-20	22.6	50	32.9	30
11-Oct-20	17.2	50	33.0	30
17-Oct-20	30.6	50	31.9	30
23-Oct-20	13.3	50	31.7	30
29-Oct-20	11.7	50	30.7	30
4-Nov-20	22.1	50	30.7	30
10-Nov-20	15.9	50	30.6	30
16-Nov-20	43.3	50	30.7	30
22-Nov-20	32.3	50	29.8	30
28-Nov-20	52.4	50	29.8	30
4-Dec-20	29.0	50	28.6	30
10-Dec-20	37.2	50	27.3	30
16-Dec-20	10.1	50	26.6	30
22-Dec-20	10.9	50	26.2	30
28-Dec-20	16.5	50	26.0	30

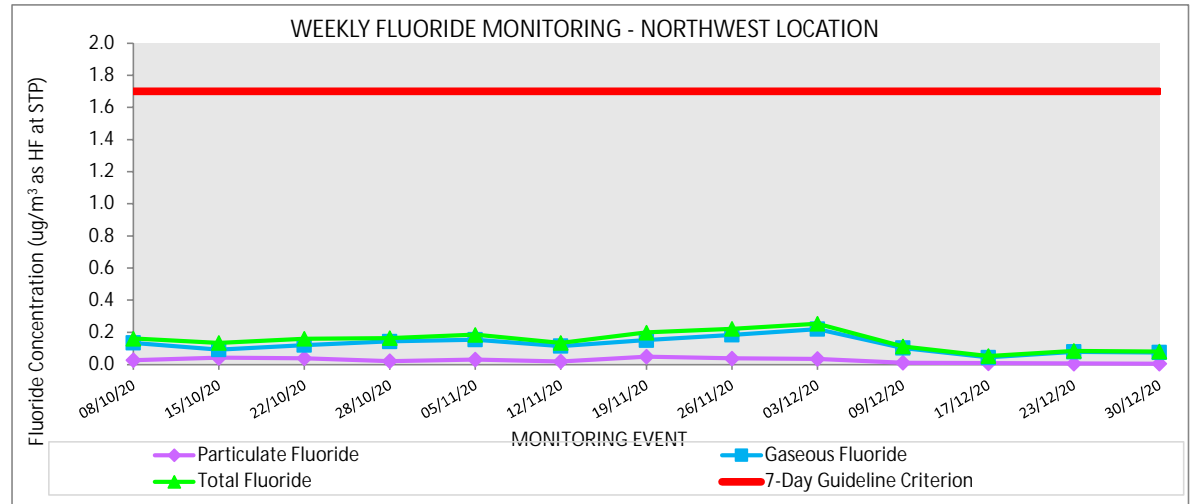
*Bold denotes exceedance



North West Monitoring Location - 7 Day Fluoride Monitoring

North West - 7 Day Fluoride Monitoring					
October 2020 to December 2020					

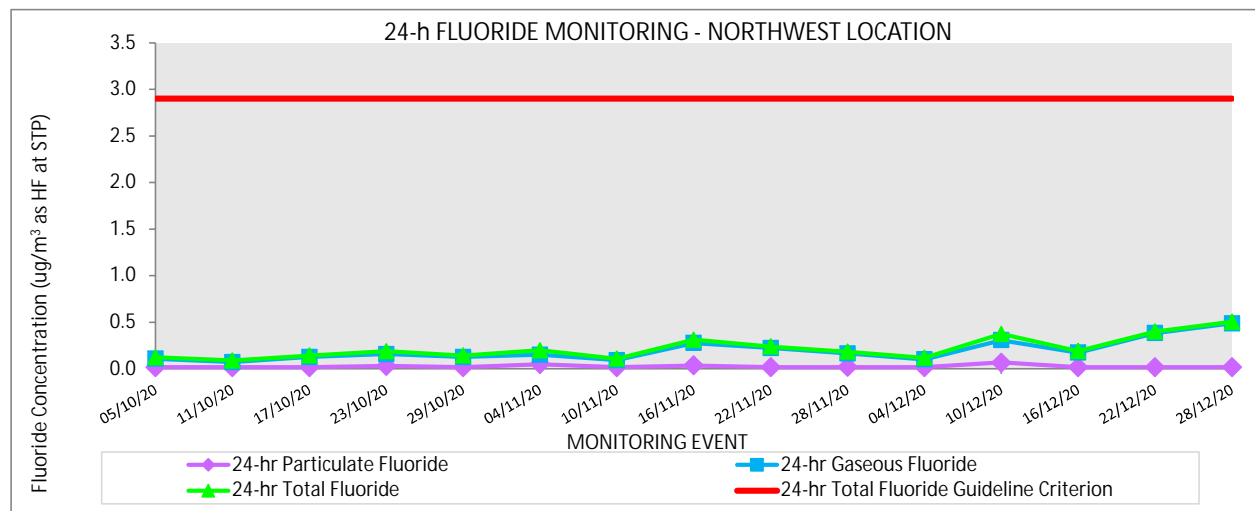
Monitoring Event		Particulate Fluoride	Gaseous Fluoride	Total Fluoride	7-Day Guideline Criterion
Start Date	End Date	($\mu\text{g}/\text{m}^3$ as HF at STP)	($\mu\text{g}/\text{m}^3$ as HF at STP)	($\mu\text{g}/\text{m}^3$ as HF at STP)	($\mu\text{g}/\text{m}^3$ as HF at STP)
1-Oct-20	8-Oct-20	0.027	0.134	0.161	1.7
8-Oct-20	15-Oct-20	0.042	0.092	0.134	1.7
15-Oct-20	22-Oct-20	0.039	0.121	0.160	1.7
22-Oct-20	28-Oct-20	0.021	0.143	0.164	1.7
28-Oct-20	5-Nov-20	0.031	0.154	0.185	1.7
5-Nov-20	12-Nov-20	0.019	0.115	0.134	1.7
12-Nov-20	19-Nov-20	0.048	0.151	0.199	1.7
19-Nov-20	26-Nov-20	0.038	0.184	0.222	1.7
26-Nov-20	3-Dec-20	0.035	0.220	0.255	1.7
3-Dec-20	9-Dec-20	0.011	0.102	0.113	1.7
9-Dec-20	17-Dec-20	0.008	0.044	0.052	1.7
17-Dec-20	23-Dec-20	0.006	0.079	0.085	1.7
23-Dec-20	30-Dec-20	0.005	0.075	0.080	1.7



North West Monitoring Location - 24 hour Fluoride Monitoring

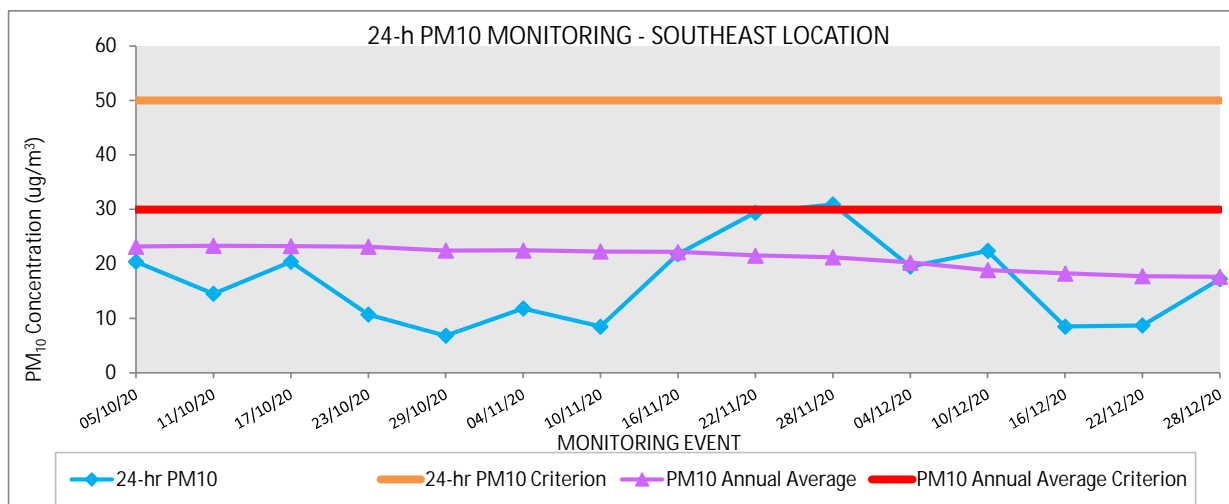
North West - 24 hour Fluoride Monitoring
October 2020 to December 2020

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)
5-Oct-20	0.016	0.108	0.124	2.9
11-Oct-20	0.016	0.071	0.087	2.9
17-Oct-20	0.016	0.126	0.142	2.9
23-Oct-20	0.031	0.157	0.188	2.9
29-Oct-20	0.016	0.126	0.142	2.9
4-Nov-20	0.049	0.151	0.200	2.9
10-Nov-20	0.016	0.092	0.108	2.9
16-Nov-20	0.036	0.277	0.313	2.9
22-Nov-20	0.016	0.223	0.239	2.9
28-Nov-20	0.018	0.165	0.183	2.9
4-Dec-20	0.017	0.101	0.118	2.9
10-Dec-20	0.066	0.308	0.374	2.9
16-Dec-20	0.017	0.173	0.190	2.9
22-Dec-20	0.017	0.383	0.400	2.9
28-Dec-20	0.017	0.486	0.503	2.9



South East Monitoring Location - 24 hour PM10 Monitoring

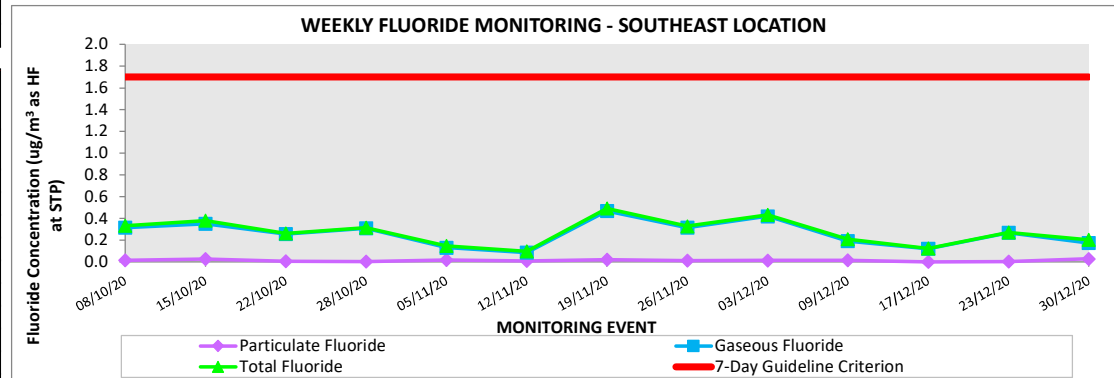
South East - 24 hour PM10 Monitoring				
October 2020 to December 2020				
Monitoring Event	24-hr PM ₁₀	24-hr PM ₁₀ Criterion	PM ₁₀ Annual Average	PM ₁₀ Annual Average Criterion
	(µg/m ³)	(µg/m ³)	(µg/m ³)	
05-Oct-20	20.4	50	23.2	30
11-Oct-20	14.5	50	23.3	30
17-Oct-20	20.4	50	23.3	30
23-Oct-20	10.7	50	23.2	30
29-Oct-20	6.8	50	22.5	30
04-Nov-20	11.8	50	22.5	30
10-Nov-20	8.5	50	22.3	30
16-Nov-20	21.8	50	22.2	30
22-Nov-20	29.4	50	21.5	30
28-Nov-20	30.9	50	21.2	30
04-Dec-20	19.5	50	20.2	30
10-Dec-20	22.4	50	18.9	30
16-Dec-20	8.5	50	18.3	30
22-Dec-20	8.7	50	17.7	30
28-Dec-20	17.2	50	17.6	30



South East Monitoring Location - 7 Day Fluoride Monitoring

South East - 7 Day Fluoride Monitoring					
October 2020 to December 2020					

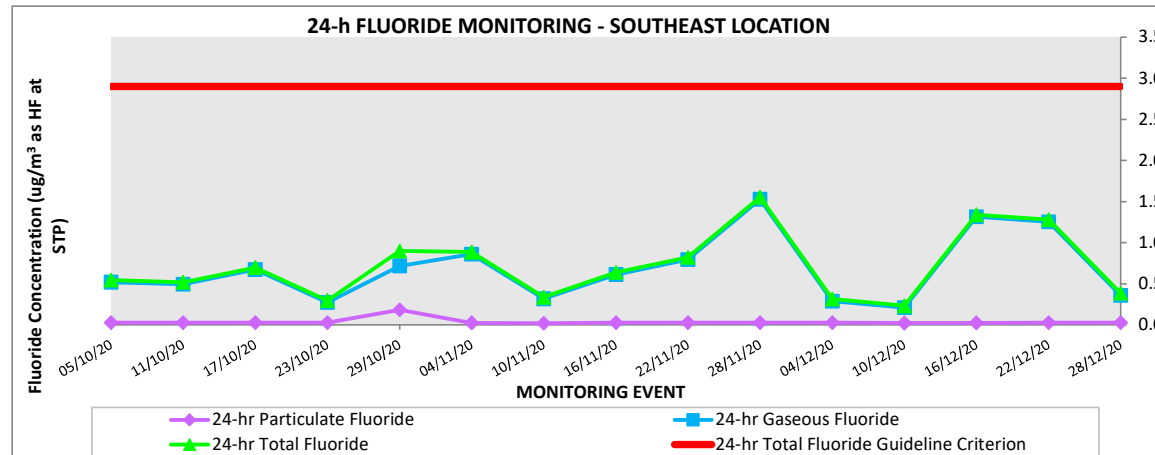
Monitoring Event		Particulate Fluoride	Gaseous Fluoride	Total Fluoride	7-Day Guideline Criterion
Start Date	End Date	($\mu\text{g}/\text{m}^3$ as HF at STP)	($\mu\text{g}/\text{m}^3$ as HF at STP)	($\mu\text{g}/\text{m}^3$ as HF at STP)	($\mu\text{g}/\text{m}^3$ as HF at STP)
1-Oct-20	8-Oct-20	0.016	0.317	0.333	1.7
8-Oct-20	15-Oct-20	0.028	0.352	0.380	1.7
15-Oct-20	22-Oct-20	0.005	0.257	0.262	1.7
22-Oct-20	28-Oct-20	0.003	0.311	0.314	1.7
28-Oct-20	5-Nov-20	0.018	0.131	0.149	1.7
5-Nov-20	12-Nov-20	0.010	0.087	0.097	1.7
12-Nov-20	19-Nov-20	0.022	0.469	0.491	1.7
19-Nov-20	26-Nov-20	0.013	0.316	0.329	1.7
26-Nov-20	3-Dec-20	0.015	0.420	0.435	1.7
3-Dec-20	9-Dec-20	0.016	0.193	0.209	1.7
9-Dec-20	17-Dec-20	0.002	0.122	0.124	1.7
17-Dec-20	23-Dec-20	0.003	0.268	0.271	1.7
23-Dec-20	30-Dec-20	0.029	0.175	0.204	1.7



South East Monitoring Location - 24 hour Fluoride Monitoring

South East - 24 hour Fluoride Monitoring
October 2020 to December 2020

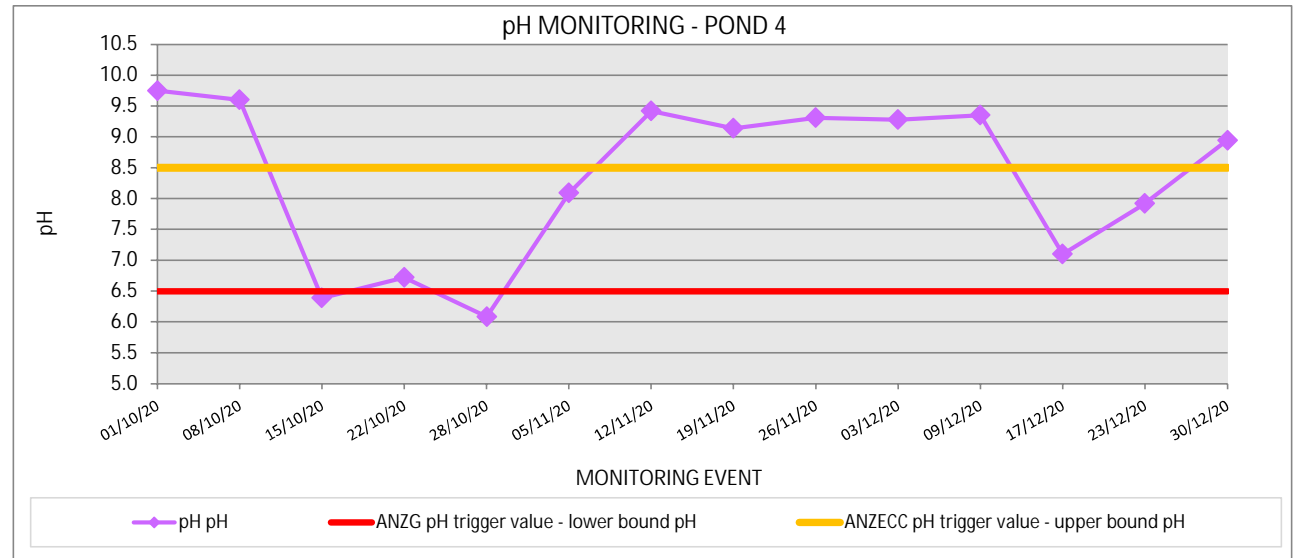
Monitoring Event	24-hr Particulate Fluoride	24-hr Gaseous Fluoride	24-hr Total Fluoride	24-hr Total Fluoride Guideline Criterion
	($\mu\text{g}/\text{m}^3$ as HF at STP)	($\mu\text{g}/\text{m}^3$ as HF at STP)	($\mu\text{g}/\text{m}^3$ as HF at STP)	($\mu\text{g}/\text{m}^3$ as HF at STP)
5-Oct-20	0.026	0.518	0.544	2.9
11-Oct-20	0.026	0.493	0.519	2.9
17-Oct-20	0.026	0.671	0.697	2.9
23-Oct-20	0.026	0.271	0.297	2.9
29-Oct-20	0.183	0.717	0.900	2.9
4-Nov-20	0.025	0.861	0.886	2.9
10-Nov-20	0.020	0.316	0.336	2.9
16-Nov-20	0.026	0.612	0.638	2.9
22-Nov-20	0.026	0.794	0.820	2.9
28-Nov-20	0.027	1.527	1.554	2.9
4-Dec-20	0.026	0.289	0.315	2.9
10-Dec-20	0.023	0.209	0.232	2.9
16-Dec-20	0.025	1.315	1.340	2.9
22-Dec-20	0.027	1.252	1.279	2.9
28-Dec-20	0.027	0.357	0.384	2.9



Pond 4 Monitoring Location - Weekly pH Monitoring

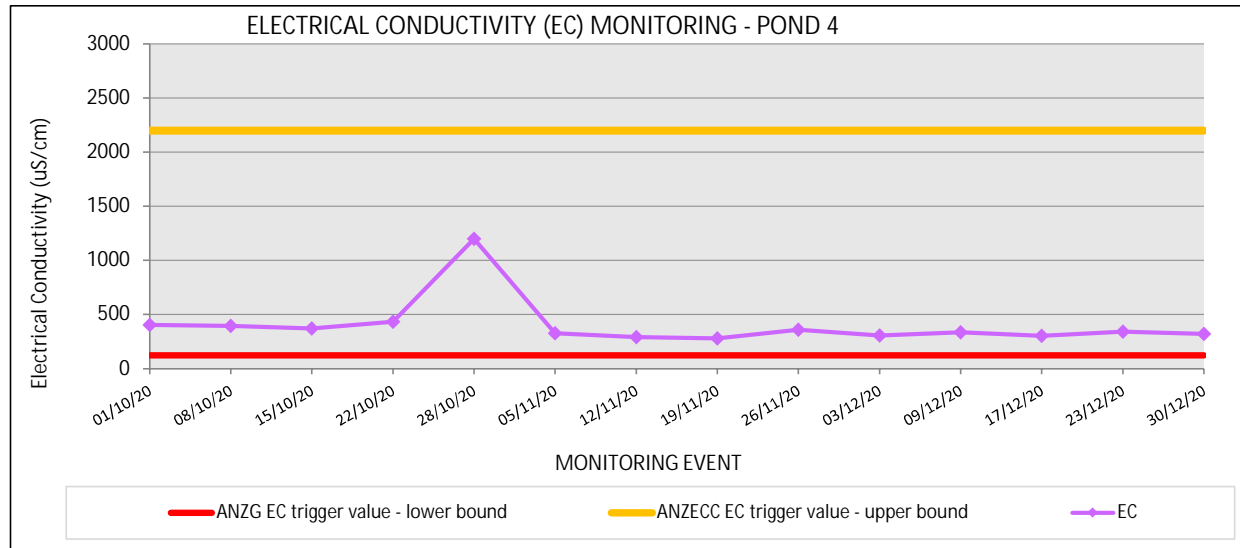
Pond 4 - Weekly pH Monitoring				
October 2020 to December 2020				
Monitoring Event	pH	ANZG pH trigger value - lower bound	ANZECC pH trigger value - upper bound	Unable to Sample
	pH	pH	pH	
1-Oct-20	9.75	6.5	8.5	
8-Oct-20	9.60	6.5	8.5	
15-Oct-20	6.39	6.5	8.5	
22-Oct-20	6.72	6.5	8.5	
28-Oct-20	6.09	6.5	8.5	
5-Nov-20	8.09	6.5	8.5	
12-Nov-20	9.42	6.5	8.5	
19-Nov-20	9.14	6.5	8.5	
26-Nov-20	9.31	6.5	8.5	
3-Dec-20	9.28	6.5	8.5	
9-Dec-20	9.35	6.5	8.5	
17-Dec-20	7.10	6.5	8.5	
23-Dec-20	7.92	6.5	8.5	
30-Dec-20	8.95	6.5	8.5	

Bold denotes guideline exceedance



Pond 4 Monitoring Location - Weekly EC Monitoring

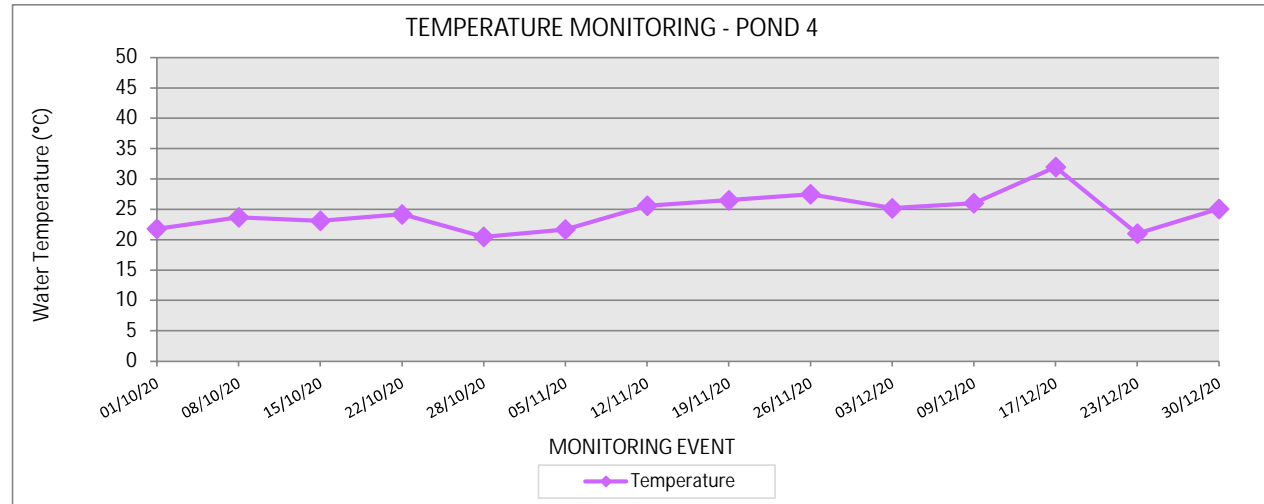
Pond 4 - Weekly EC Monitoring				
October 2020 to December 2020				
Monitoring Event	EC	ANZG EC trigger value - lower bound	ANZECC EC trigger value - upper bound	Unable to Sample
	µS/cm	µS/cm	µS/cm	
1-Oct-20	403	125	2200	
8-Oct-20	395	125	2200	
15-Oct-20	372	125	2200	
22-Oct-20	434	125	2200	
28-Oct-20	1200	125	2200	
5-Nov-20	327	125	2200	
12-Nov-20	292	125	2200	
19-Nov-20	281	125	2200	
26-Nov-20	360	125	2200	
3-Dec-20	306	125	2200	
9-Dec-20	336	125	2200	
17-Dec-20	302	125	2200	
23-Dec-20	342	125	2200	
30-Dec-20	322	125	2200	



Pond 4 Monitoring Location - Weekly Temperature Monitoring

Pond 4 - Weekly Temperature Monitoring
October 2020 to December 2020

Monitoring Event	Temperature °C	Unable to Sample
1-Oct-20	21.8	
8-Oct-20	23.7	
15-Oct-20	23.1	
22-Oct-20	24.2	
28-Oct-20	20.5	
5-Nov-20	21.7	
12-Nov-20	25.6	
19-Nov-20	26.5	
26-Nov-20	27.5	
3-Dec-20	25.2	
9-Dec-20	26.0	
17-Dec-20	32.0	
23-Dec-20	21.0	
30-Dec-20	25.1	

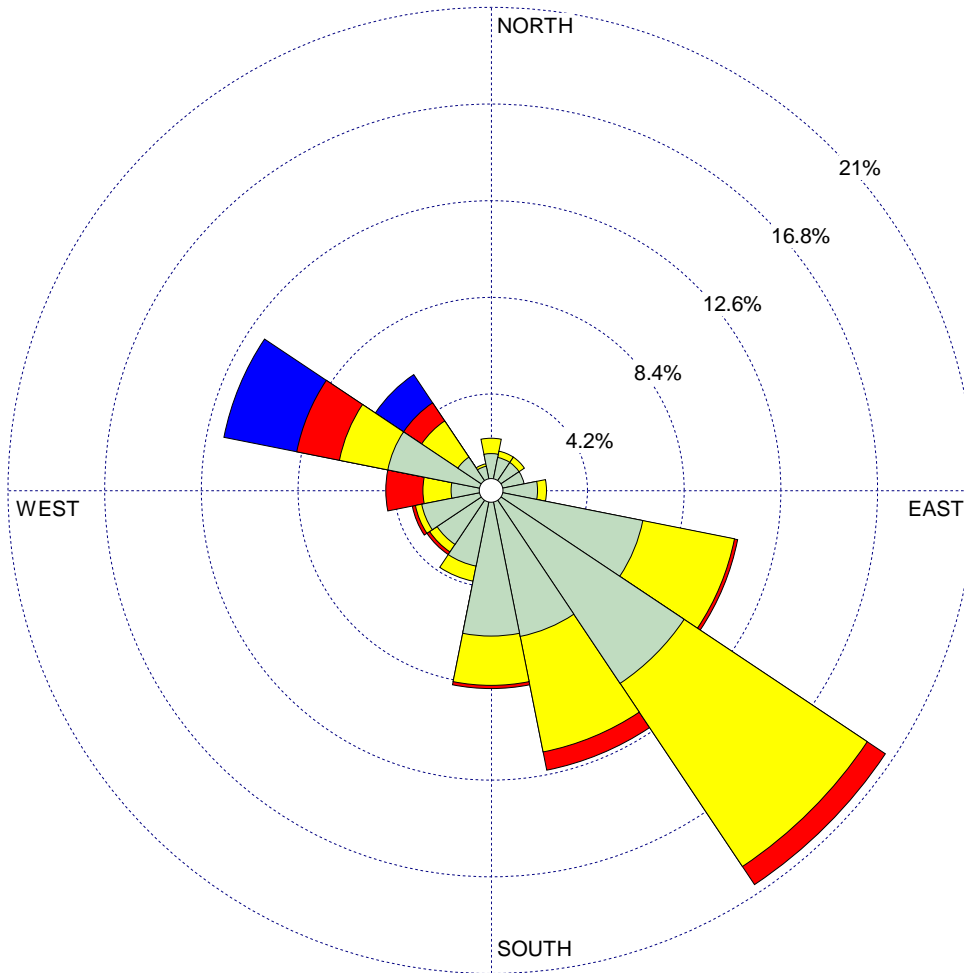


WIND ROSE PLOT:

**NCIA Meteorology Data
December 2020**

DISPLAY:

**Wind Speed
Direction (blowing from)**



**WIND SPEED
(m/s)**

- ≥ 11.10
- 8.80 - 11.10
- 5.70 - 8.80
- 3.60 - 5.70
- 2.10 - 3.60
- 0.30 - 2.10

Calms: 3.23%

COMMENTS:

DATA PERIOD:

**Start Date: 1/12/2020 - 00:00
End Date: 31/12/2020 - 23:00**

COMPANY NAME:

MODELER:

CALM WINDS:

3.23%

TOTAL COUNT:

743 hrs.

AVG. WIND SPEED:

2.09 m/s

DATE:

11/01/2021

PROJECT NO.:

60613063

