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23 July 2018

Chris Schneider
Managing Director
National Ceramic Industries Australia
PO Box 765

Maitland NSW 2320

Dear Chris

Environmental Monitoring for National Ceramic Industries Australia - June 2018

Please find enclosed the documentation for the environmental monitoring carried out for National Ceramic Industries Australia during June 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 (PM_{10}) 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_{10} 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 PM_{10} (particulate matter with an aerodynamic diameter of less than 10 μm) are:

- 50 $\mu g/m^3$ over a 24-hour period; and
- 30 $\mu g/m^3$ 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 $\mu g/m^3$ over a 24-hour period; and
- 1.7 $\mu g/m^3$ 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 µS/cm (Table 3.3.3 - NSW Lowland River).

3.0 Monitoring Results

Monitoring results for the month of June 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.

All June PM_{10} monitoring results were below the consent 24 hour criterion of 50µg/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 30µg/m^3. The North West annual average sits at 28.1 µg/m^3 following the completion of the June monitoring period while the South East average is 20.9µg/m^3.

Fluoride results for June 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 June were within the ANZECC 2000 pH guideline. All Pond 4 EC readings taken during the June monitoring period were within the ANZECC guidelines. Water temperature was also measured weekly however no guideline is available for assessment. Pond 4 was observed to have a slight flow on 21 June however all parameters were within the relevant guidelines at this time. Pond 4 was not observed to be discharging during any of the remaining June site visits.

Monitoring results and plots can be found attached including the wind rose for June. 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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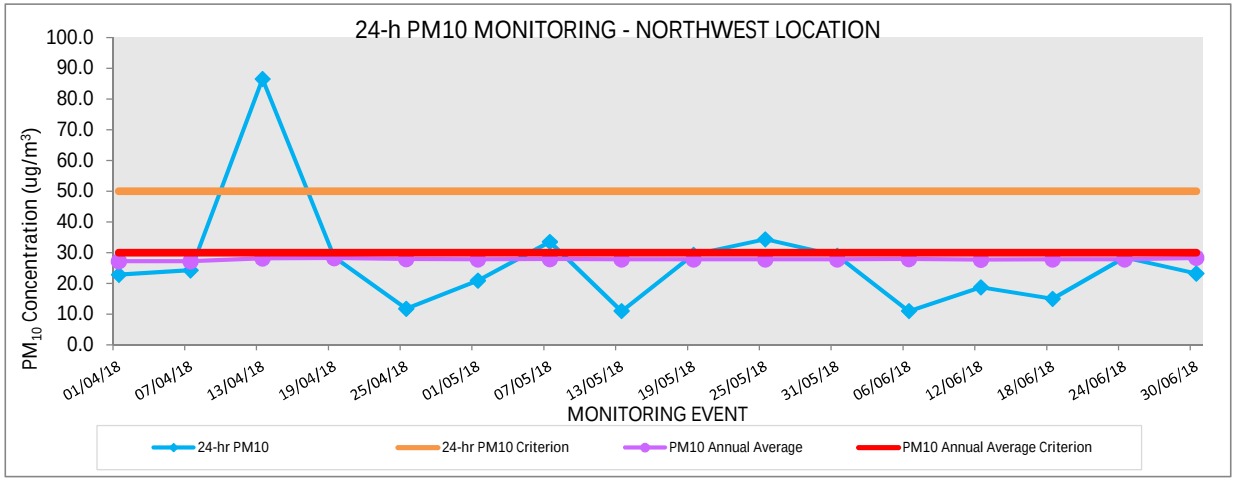
encl: Monitoring data tables and charts, wind rose

North West Monitoring Location - 24 hour PM10 Monitoring

North West - 24 hour PM10 Monitoring				
April 2018 to June 2018				
Monitoring Event	24-hr PM_{10} (µg/m3)	24-hr PM_{10} Criterion ($\mu g/m^3$)	PM_{10} Annual Average ($\mu g/m^3$)	PM_{10} Annual Average Criterion
1-Apr-18	22.8	50	27.2	30
7-Apr-18	24.3	50	27.2	30
13-Apr-18	**86.5**	50	28.1	30
19-Apr-18	28.5	50	28.2	30
25-Apr-18	11.8	50	27.9	30
1-May-18	20.9	50	27.8	30
7-May-18	33.5	50	27.9	30
13-May-18	11.0	50	27.8	30
19-May-18	29.4	50	27.8	30
25-May-18	34.4	50	27.8	30
31-May-18	29.1	50	27.9	30
6-Jun-18	11.0	50	27.9	30
12-Jun-18	18.8	50	27.8	30
18-Jun-18	15.0	50	27.8	30
24-Jun-18	28.4	50	27.8	30
30-Jun-18	23.2	50	28.3	30

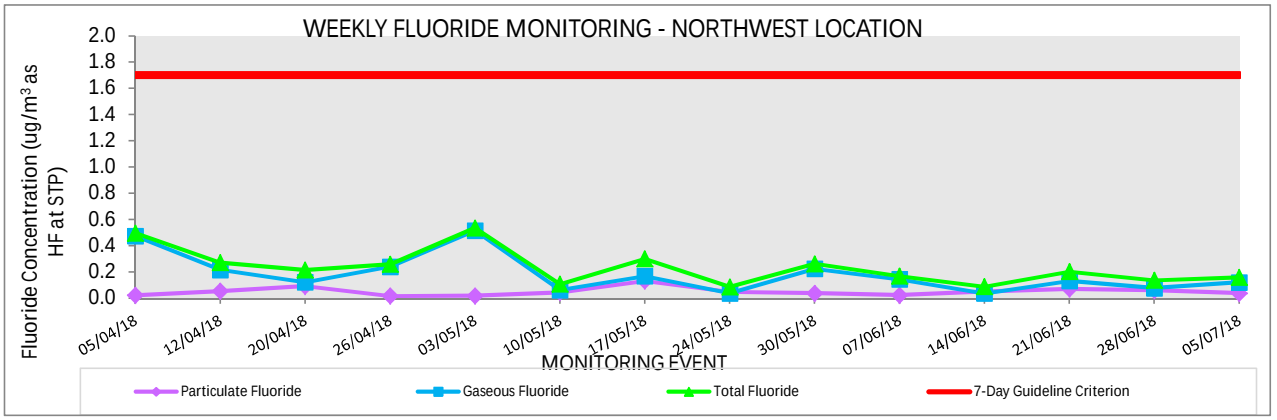
***Bold denotes exceedance**



North West Monitoring Location - 7 Day Fluoride Monitoring

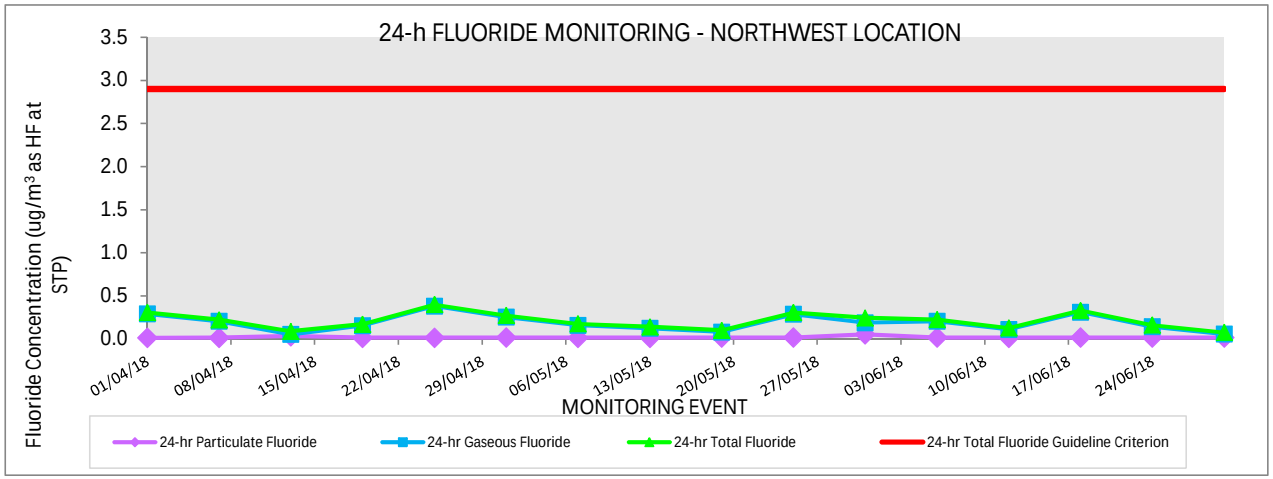
North West - 7 Day Fluoride Monitoring				
April 2018 to June 2018				

Monitoring Event	Particulate Fluoride	Gaseous Fluoride	Total Fluoride	7-Day Guideline Criterion
	($\mu g/m^3$ as HF at STP)	($\mu g/m^3$ as HF at STP)	($\mu g/m^3$ as HF at STP)	($\mu g/m^3$ as HF at STP)
5-Apr-18	0.023	0.475	0.498	1.7
12-Apr-18	0.055	0.217	0.272	1.7
20-Apr-18	0.092	0.123	0.215	1.7
26-Apr-18	0.018	0.241	0.259	1.7
3-May-18	0.019	0.517	0.536	1.7
10-May-18	0.045	0.063	0.108	1.7
17-May-18	0.132	0.169	0.301	1.7
24-May-18	0.050	0.038	0.088	1.7
30-May-18	0.038	0.225	0.263	1.7
7-Jun-18	0.024	0.145	0.169	1.7
14-Jun-18	0.052	0.037	0.089	1.7
21-Jun-18	0.071	0.132	0.203	1.7
28-Jun-18	0.060	0.078	0.138	1.7
5-Jul-18	0.038	0.122	0.160	1.7



North West Monitoring Location - 24 hour Fluoride Monitoring

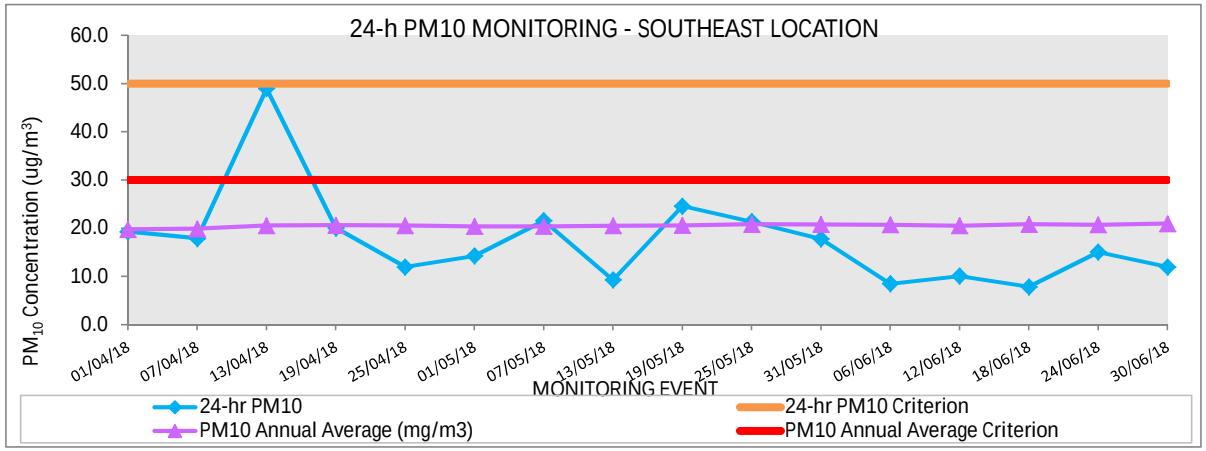
North West - 24 hour Fluoride Monitoring				
April 2018 to June 2018				
Monitoring Event	**24-hr Particulate Fluoride**	**24-hr Gaseous Fluoride**	**24-hr Total Fluoride**	**24-hr Total Fluoride Guideline Criterion**
	(µg/m³ as HF at STP)	**(µg/m³ as HF at STP)**	**(µg/m³ as HF at STP)**	**(µg/m³ as HF at STP)**
1-Apr-18	0.015	0.293	0.308	2.9
7-Apr-18	0.016	0.208	0.224	2.9
13-Apr-18	0.035	0.056	0.091	2.9
19-Apr-18	0.016	0.157	0.173	2.9
25-Apr-18	0.016	0.384	0.400	2.9
1-May-18	0.018	0.256	0.274	2.9
7-May-18	0.016	0.162	0.178	2.9
13-May-18	0.016	0.127	0.143	2.9
19-May-18	0.018	0.084	0.102	2.9
25-May-18	0.019	0.289	0.308	2.9
31-May-18	0.055	0.192	0.247	2.9
6-Jun-18	0.019	0.208	0.227	2.9
12-Jun-18	0.017	0.113	0.130	2.9
18-Jun-18	0.019	0.314	0.333	2.9
24-Jun-18	0.019	0.144	0.163	2.9
30-Jun-18	0.019	0.059	0.078	2.9



South East Monitoring Location - 24 hour PM10 Monitoring

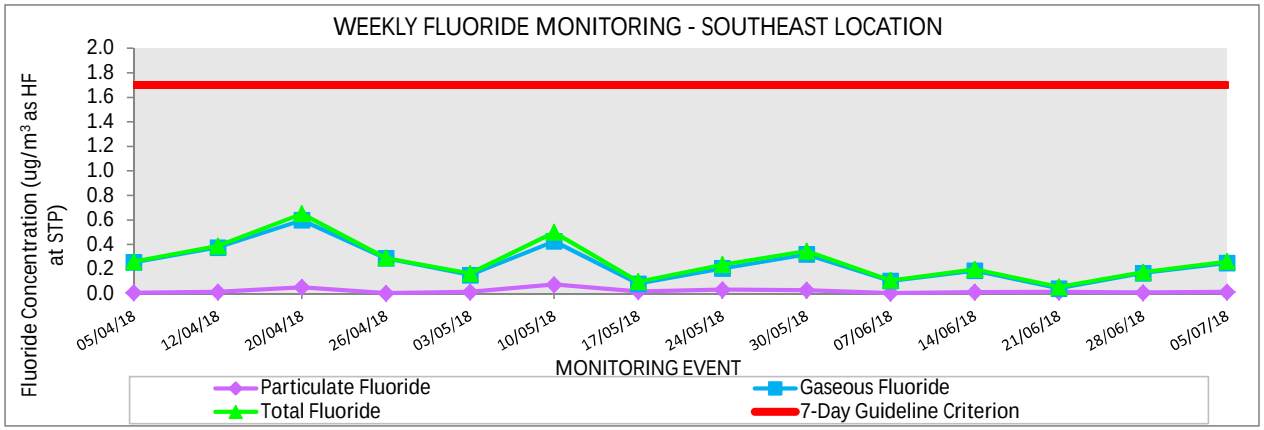
South East - 24 hour PM10 Monitoring
April 2018 to June 2018

Monitoring Event	24-hr PM_{10} ($\mu g/m^3$)	24-hr PM_{10} Criterion ($\mu g/m^3$)	PM_{10} Annual Average ($\mu g/m^3$)	PM_{10} Annual Average Criterion
1-Apr-18	19.3	50	19.8	30
7-Apr-18	17.9	50	19.9	30
13-Apr-18	49.0	50	20.6	30
19-Apr-18	20.1	50	20.6	30
25-Apr-18	12.0	50	20.6	30
1-May-18	14.3	50	20.4	30
7-May-18	21.6	50	20.4	30
13-May-18	9.3	50	20.5	30
19-May-18	24.6	50	20.6	30
25-May-18	21.4	50	20.8	30
31-May-18	17.8	50	20.8	30
06/06/18	8.5	50	20.7	30
12/06/18	10.1	50	20.5	30
18/06/18	7.9	50	20.8	30
24/06/18	15.1	50	20.7	30
30/06/18	12.0	50	20.9	30



South East Monitoring Location - 7 Day Fluoride Monitoring

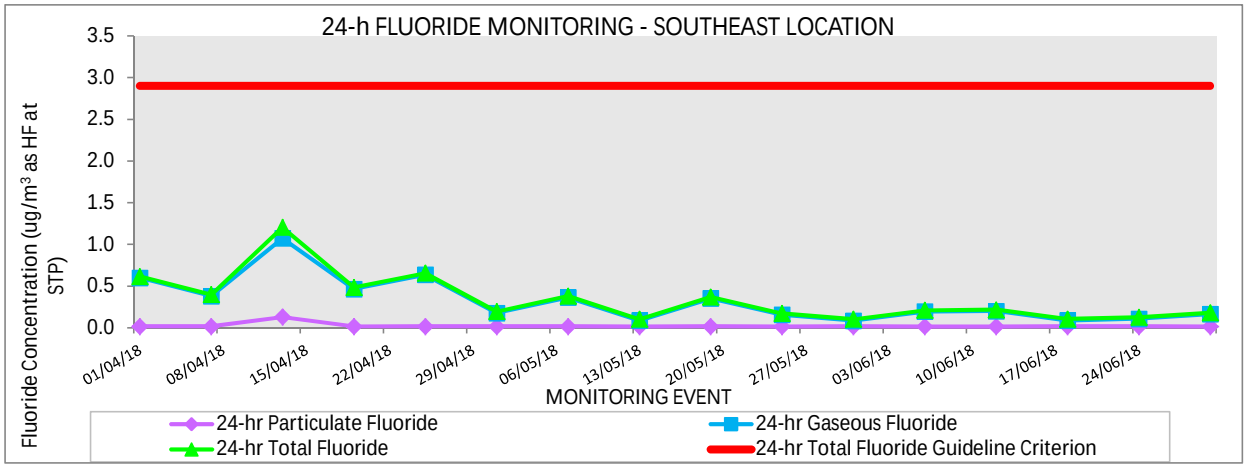
South East - 7 Day Fluoride Monitoring				
April 2018 to June 2018				
Monitoring Event	**Particulate Fluoride** ($\mu g/m^3$ as HF at STP)	**Gaseous Fluoride** ($\mu g/m^3$ as HF at STP)	**Total Fluoride** ($\mu g/m^3$ as HF at STP)	**7-Day Guideline Criterion** ($\mu g/m^3$ as HF at STP)
5-Apr-18	0.007	0.255	0.262	1.7
12-Apr-18	0.013	0.377	0.390	1.7
20-Apr-18	0.052	0.600	0.652	1.7
26-Apr-18	0.003	0.289	0.292	1.7
3-May-18	0.013	0.152	0.165	1.7
10-May-18	0.073	0.427	0.500	1.7
17-May-18	0.017	0.081	0.098	1.7
24-May-18	0.032	0.205	0.237	1.7
30-May-18	0.028	0.320	0.348	1.7
7-Jun-18	0.005	0.104	0.109	1.7
14-Jun-18	0.012	0.187	0.199	1.7
21-Jun-18	0.013	0.042	0.055	1.7
28-Jun-18	0.008	0.168	0.176	1.7
5-Jul-18	0.013	0.250	0.263	1.7



South East Monitoring Location - 24 hour Fluoride Monitoring

South East - 24 hour Fluoride Monitoring
April 2018 to June 2018

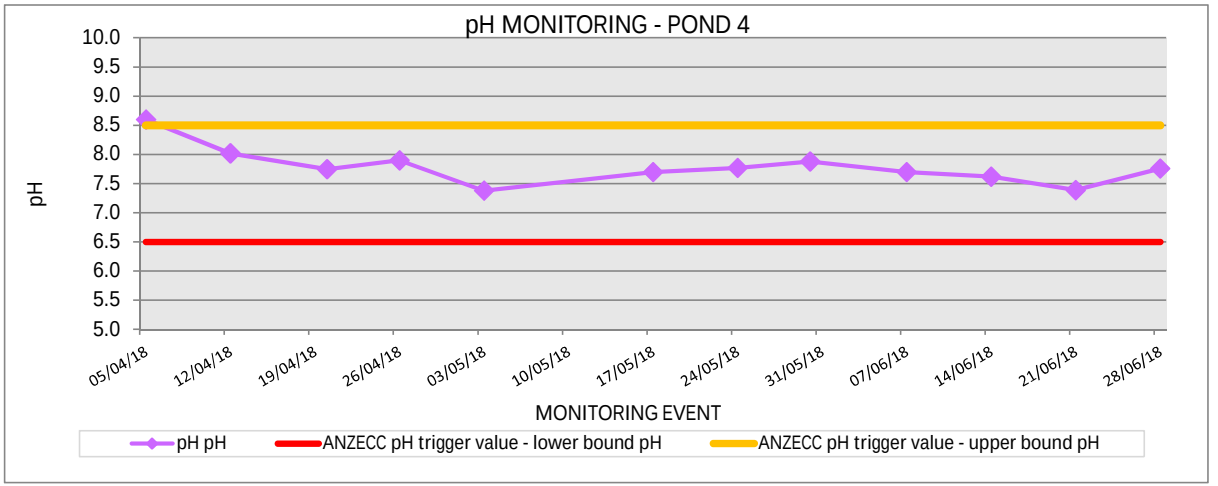
Monitoring Event	24-hr Particulate Fluoride	24-hr Gaseous Fluoride	24-hr Total Fluoride	24-hr Total Fluoride Guideline Criterion
	(µg/m^3 as HF at STP)	(µg/m^3 as HF at STP)	(µg/m^3 as HF at STP)	(µg/m^3 as HF at STP)
1-Apr-18	0.017	0.600	0.617	2.9
7-Apr-18	0.017	0.382	0.399	2.9
13-Apr-18	0.131	1.075	1.206	2.9
19-Apr-18	0.018	0.467	0.485	2.9
25-Apr-18	0.018	0.638	0.656	2.9
1-May-18	0.017	0.178	0.195	2.9
7-May-18	0.017	0.365	0.382	2.9
13-May-18	0.015	0.088	0.103	2.9
19-May-18	0.017	0.353	0.370	2.9
25-May-18	0.016	0.157	0.173	2.9
31-May-18	0.017	0.087	0.104	2.9
6-Jun-18	0.016	0.196	0.212	2.9
12-Jun-18	0.015	0.201	0.216	2.9
18-Jun-18	0.017	0.088	0.105	2.9
24-Jun-18	0.017	0.110	0.127	2.9
30-Jun-18	0.016	0.165	0.181	2.9



Pond 4 Monitoring Location - Weekly pH Monitoring

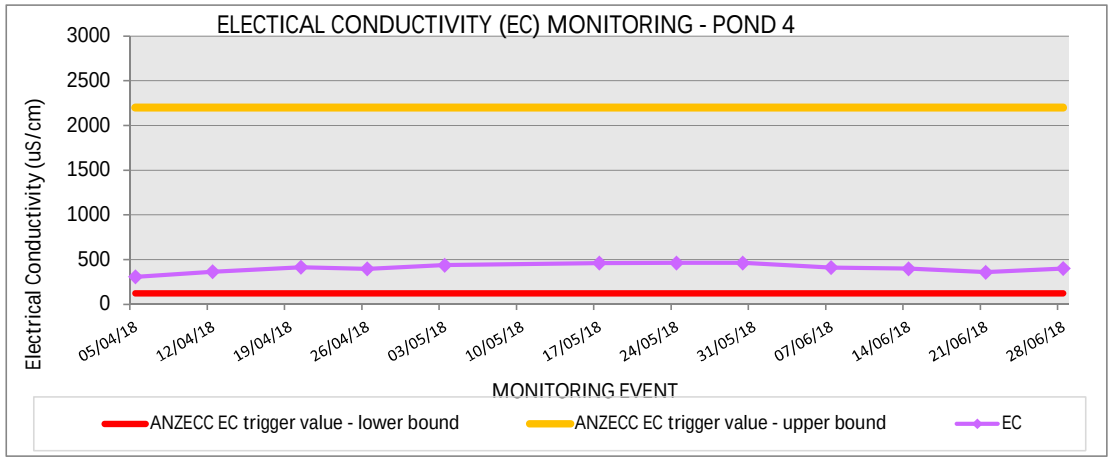
Pond 4 - Weekly pH Monitoring				
April 2018 to June 2018				
Monitoring Event	**pH**	**ANZECC pH trigger value - lower bound**	**ANZECC pH trigger value - upper bound**	**Unable to Sample**
	pH	**pH**	**pH**	
5/04/2018	**8.60**	6.5	8.5	
12/04/2018	8.02	6.5	8.5	
20/04/2018	7.75	6.5	8.5	
26/04/2018	7.90	6.5	8.5	
3/05/2018	7.38	6.5	8.5	
17/05/2018	7.70	6.5	8.5	
24/05/2018	7.77	6.5	8.5	
30/05/2018	7.88	6.5	8.5	
7/06/2018	7.70	6.5	8.5	
14/06/2018	7.62	6.5	8.5	
21/06/2018	7.39	6.5	8.5	
28/06/2018	7.76	6.5	8.5	

***Bold denotes exceedance**



Pond 4 Monitoring Location - Weekly EC Monitoring

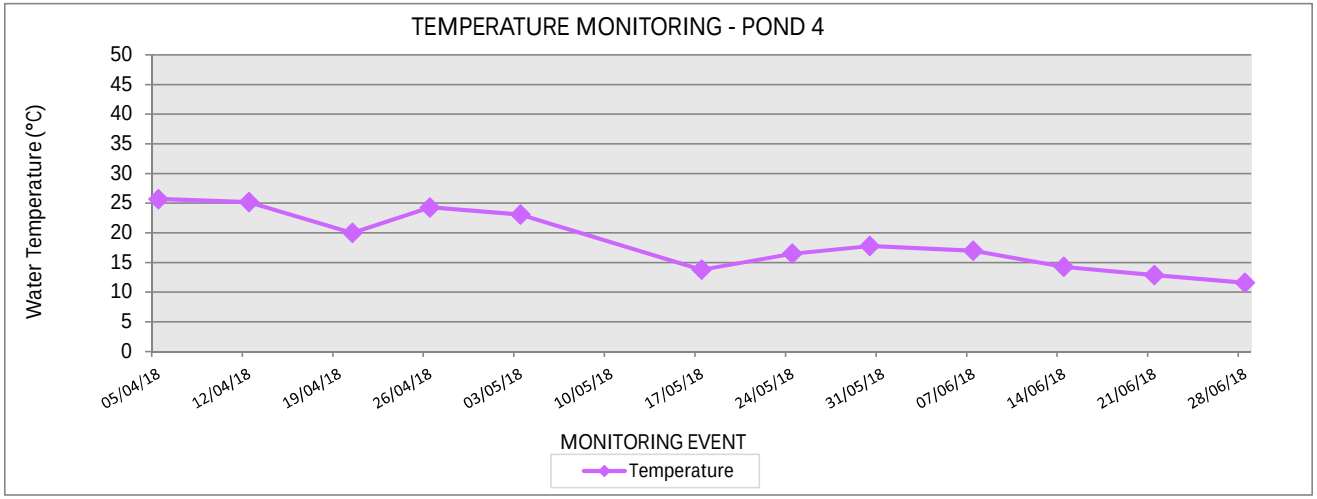
Pond 4 - Weekly EC Monitoring				
April 2018 to June 2018				
Monitoring Event	**EC**	**ANZECC EC trigger value - lower bound**	**ANZECC EC trigger value - upper bound**	**Unable to Sample**
	µS/cm	**µS/cm**	**µS/cm**	
5/04/2018	307	125	2200	
12/04/2018	366	125	2200	
20/04/2018	415	125	2200	
26/04/2018	397	125	2200	
3/05/2018	438	125	2200	
17/05/2018	461	125	2200	
24/05/2018	463	125	2200	
30/05/2018	464	125	2200	
7/06/2018	412	125	2200	
14/06/2018	399	125	2200	
21/06/2018	359	125	2200	
28/06/2018	401	125	2200	



Pond 4 Monitoring Location - Weekly Temperature Monitoring

Pond 4 - Weekly Temperature Monitoring
April 2018 to June 2018

Monitoring Event	Temperature °C	Unable to Sample
5/04/2018	25.7	
12/04/2018	25.2	
20/04/2018	20.0	
26/04/2018	24.3	
3/05/2018	23.1	
17/05/2018	13.8	
24/05/2018	16.5	
30/05/2018	17.8	
7/06/2018	17.0	
14/06/2018	14.3	
21/06/2018	12.9	
28/06/2018	11.6	

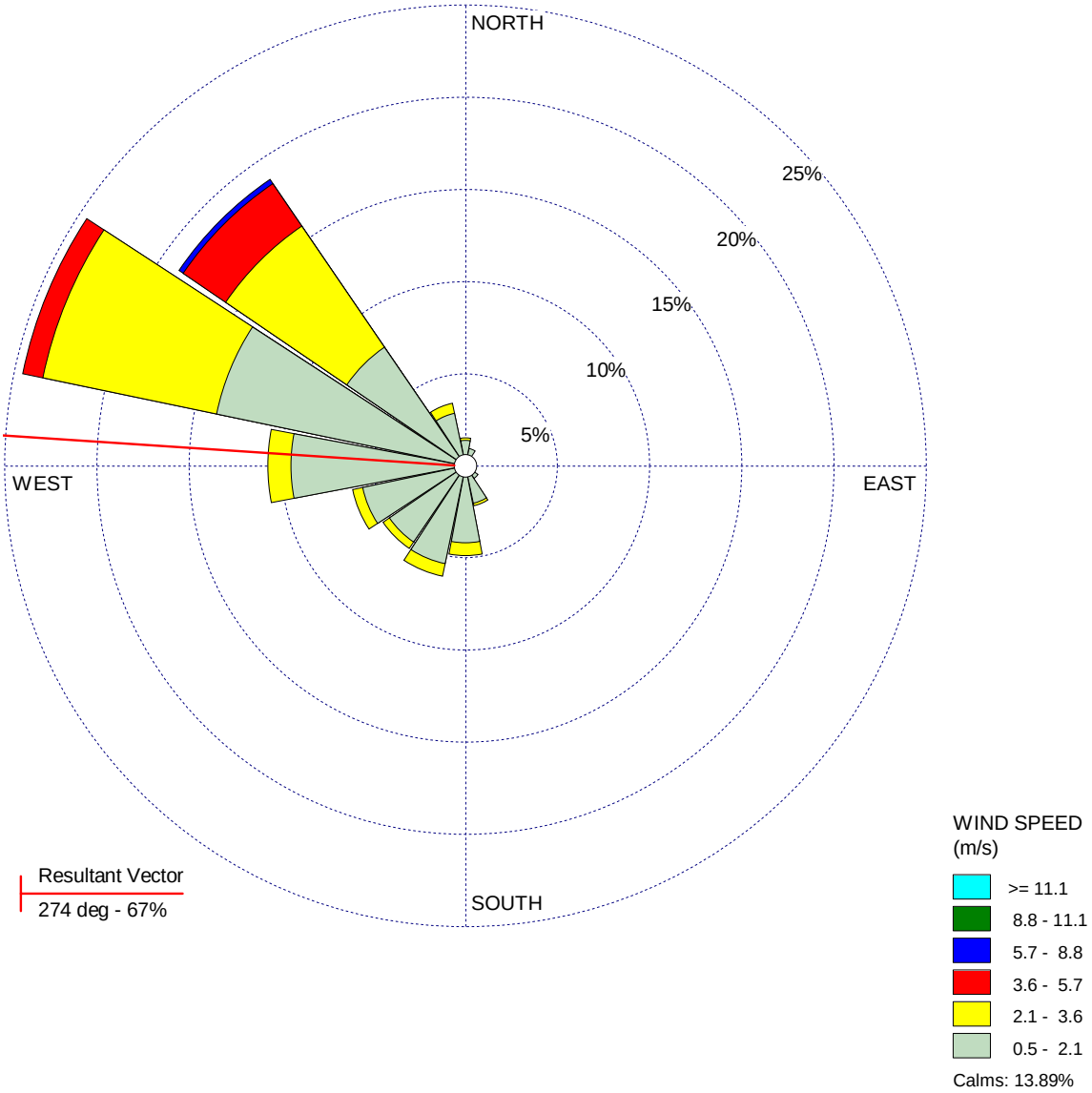


WIND ROSE PLOT:

NCIA - Meteorological Data
June Sampling Period - June 2018

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:	DATA PERIOD: **Start Date: 1/06/2018 - 00:00** **End Date: 30/06/2018 - 23:00**	COMPANY NAME:	
		MODELER:	
	CALM WINDS: **13.89%**	TOTAL COUNT: **719 hrs.**	
	AVG. WIND SPEED: **1.44 m/s**	DATE: **20/07/2018**	PROJECT NO.: **60551495**