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ECOSYSTEM MANAGEMENT AND MONITORING



March Quarterly Aquatic Ecosystem Monitoring Report

Liverpool City Council

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Project Liverpool Aquatic Ecosystem Monitoring 2023 - 2023

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Report Structure

This report presents the March Aquatic Ecosystem Monitoring Monthly Progress Report (Part 1) which is accompanied by the quarterly report (January 2023 to March 2023).

Part 1

Aquatic Ecosystem Monitoring Monthly Progress Report - March 2023

March 2023 aquatic ecosystem monitoring of the Georges River and South Creek catchments was conducted on March 10, 2023.

March results showed elevated nutrient concentrations, dissolved oxygen, and turbidity compared to February. Furthermore, the March results showed higher electrical conductivity and nutrient concentrations compared to January and February results.

This report provides a summary of recreation water quality indicators (*Cyanobacteria*, *Enterococci* and *Faecal Coliforms*) at Georges River recreation monitoring sites and observations from freshwater monitoring sites.

Badgerys Creek weather monitoring station is expected to be representative of weather conditions in the Kemps Creek catchment and Holsworthy Aerodrome station is expected to be representative of conditions in the locale of the Georges River monitoring sites.

Weather conditions during March 2023 sampling were cool with 2.8 mm rain recorded at Badgerys Creek monitoring station (Table 1) and 1.6 mm recorded at Holsworthy Aerodrome (Table 2) in the week prior to sampling.

Table 1: Weather observations for Badgerys Creek AWS, NSW (BOM 2023).

Date	Temp min (°C)	Temp max (°C)	Rainfall (mm)
4/03/2023	17.1	26.7	2.6
5/03/2023	14.2	32.4	0.2
6/03/2023	17.7	40.4	0
7/03/2023	18.3	36.2	0
8/03/2023	10.2	33.4	0
9/03/2023	12.5	30.3	0
10/03/2023	12.3	30.6	0

Table 2: Weather observations for Holsworthy Aerodrome (BOM 2023).

Date	Temp min (°C)	Temp max (°C)	Rainfall (mm)
4/03/2023	16.9	27.1	1.6
5/03/2023	15.4	30.5	0
6/03/2023	18.6	38.7	0
7/03/2023	19.9	35.6	0
8/03/2023	12.6	32.4	0
9/03/2023	15	28	0
10/03/2023	12.6	27.3	0

Blue Green Algae (Cyanobacteria) monitoring at recreation sites in the Georges River was undertaken on March 10, 2023, during mid tide.

Results show that potentially toxic cyanobacteria were detected during sampling at sites GR3 and GR4, and biovolume calculations indicate (Table 3).

- NHMRC Alert Mode (Amber Level) was triggered at GR3 and GR4 (Table 3).
- NHMRC Surveillance Mode (Green Level) was triggered at GR5 (Table 3).

Table 3: Results summary for recreation monitoring sites, March 2023.

Site	Sampled	Potentially Toxic Blue Green Algae	NHMRC Alert Level	Safety Issues
GR1	Yes	Not detected	-	None
GR1.5	Yes	Not detected	-	None
GR2	Yes	Not detected	-	None
GR3	Yes	Detected	Amber	None
GR4	Yes	Detected	Amber	None
GR5	Yes	Not detected	Green	None

At GR1 five species that are not known to be toxic were recorded at low levels, including: *Aphanocapsa spp.*, *Cyanogranis libera*, *Pseudanabaena spp.*, *Romeria spp.* and *cf. Synechococcus spp.*. No NHMRC (2008) response was triggered by these low biovolumes.

At GR1.5 six species that are not known to be toxic were recorded at low levels, including: *Aphanocapsa spp.*, *Cyanogranis libera*, *Merismopedia spp.*, *Myxobaktron spp.*, *Romeria spp.* and *Other Nostocales*. No NHMRC (2008) response was triggered by these low biovolumes.

At GR2 four species that are not known to be toxic were recorded at low levels, including: *Aphanocapsa spp.*, *Cyanogranis libera*, *Merismopedia spp.* and *Romeria spp.*. No NHMRC (2008) response was triggered by these low biovolumes.

At GR3 eight species that are not known to be toxic and one potentially toxic species was recorded, including: *Anagnostidinema spp.*, *Aphanocapsa spp.*, *Cyanocatena spp.*, *Cyanogranis libera*, *Merismopedia spp.*, *Planktothrix spp. >5 µm*, *Pseudanabaena spp.*, *Phormidium spp. >5µm (possible PTP)* and *cf. Synechococcus spp.*. NHMRC (2008) Amber Alert response was triggered by these biovolumes and species.

At GR4 seven species that are not known to be toxic, one potentially toxic species and two potentially toxic species was recorded, including: *Aphanocapsa spp.*, *Cyanogranis libera*, *Merismopedia spp.*, *Microcystis cf. aeruginosa (known to be toxic)*, *Oscillatoria spp.*, *Phormidium spp. >5µm (possible PTP)*, *Phormidium spp. <5µm (possible PTP)*, *Planktothrix spp. >5 µm* and *Pseudanabaena spp.*. NHMRC (2008) Amber Alert response was triggered by these biovolumes and species.

At GR5 three species that are not known to be toxic, one potentially toxic species and one potentially toxic species was recorded, including: *Aphanocapsa spp.*, *Microcystis cf. aeruginosa (known to be toxic)*, *Phormidium spp. >5µm (possible PTP)*, *Planktothrix spp. >5 µm* and *Romeria spp.*. NHMRC (2008) Amber Alert response was triggered by these biovolumes and species.

Table 4: Recommended monitoring actions and corresponding NHMRC Alert Levels.

Blue Green Algae Alert Level	Recommended Actions
Surveillance Mode (Green Level)	<ul style="list-style-type: none"> Weekly sampling and cell counts at representative locations in the water body where known toxigenic species are present. Fortnightly for other types including regular visual inspection of water surface for scums.
Alert Mode (Amber Level)	<ul style="list-style-type: none"> Increase sampling frequency to twice weekly at representative locations in the water body where toxigenic species are dominant within the alert level definition (i.e. total biovolume) to establish population growth and spatial variability in the water body. Monitor weekly or fortnightly where other types are dominant. Make regular visual inspections of water surface for scums. Decide on requirement for toxicity assessment or toxin monitoring.
Action Mode (Red Level)	<ul style="list-style-type: none"> Continue monitoring as for alert mode. Immediately notify health authorities for advice on health risk. Make toxicity assessment or toxin measurement of water if this has not already been done. Health authorities warn of risk to public health (ie the authorities make a health risk assessment considering toxin monitoring data, sample type and variability).

Results of bacteria monitoring at recreation sites in March 2023 show that the ANZECC Primary Contact guidelines for *Faecal coliforms* was exceeded at GR1, GR1.5, GR2 and GR5. The ANZECC Secondary Contact guidelines for *Faecal coliforms* was exceeded at GR4. The ANZECC Primary Contact guidelines for *Enterococci* was exceeded at GR2, GR3 and GR5. The ANZECC Secondary Contact guidelines for *Enterococci* was exceeded at GR1 and GR1.5.

Table 5. Summary of conditions observed/recorded at each site during March 2023 monitoring. Orange indicates exceedance of the primary contact guideline; red indicates exceedance of the secondary contact guideline.

Recreation sites						
SITE	Sampled	Tide	<i>Faecal coliforms</i> CFU/100 mL	<i>Enterococci</i> CFU/100 mL	Safety Issues	Observations
GR1	Yes	N/A	510	23000	None	Clear
GR1.5	Yes	N/A	160	300	None	Clear
GR2	Yes	N/A	200	~110	None	Clear
GR3	Yes	Mid	71	~110	None	Clear
GR4	Yes	Mid	1800	13	None	Clear
GR5	Yes	Mid	750	160	None	Clear
Primary Contact	-	-	150	35	-	-
Secondary Contact	-	-	1000	230	-	-

Surface water samples were collected at all freshwater monitoring sites in March 2023, with the exception of KC11 (due to construction of a pipeline). During the March monitoring period, freshwater sites monitored by this program typically had only a minimal change to the results of the previous month.

Table 6. Summary of conditions observed/recorded at each site during March 2023 monitoring.

Site	Water quality	Aquatic Macroinvertebrates	Benthic Diatoms	Flow	Observations	Safety Issues
MC1	Yes	No	No	Normal	Clear	None
AC1	Yes	No	No	Normal	Clear	None
KC1	Yes	No	No	Normal	Clear	None
KC2	Yes	No	No	Normal	Turbid	None
KC3	Yes	No	No	Normal	Clear	None
KC5	No	No	No	Normal	Clear	None
KC6	Yes	No	No	Normal	Clear	None
KC8	Yes	No	No	Normal	Clear	None
KC10	Yes	No	No	Normal	Clear	None
KC11	No	No	No	-	-	No access due to construction
KC12	Yes	No	No	Normal	Clear	None
SC1	Yes	No	No	Normal	Turbid	None
SC2	Yes	No	No	Normal	Turbid	None
BC1	Yes	No	No	Normal	Turbid	None
WG	Yes	No	No	Normal	Clear	None
HC	Yes	No	No	Normal	Clear	None

All data has been supplied in an Excel spreadsheet separate this report and no safety issues were recorded/observed during monitoring.

Part 2

Introduction

This report outlines results for the quarter (January 2023 to March 2023) for the 2023-2023 monitoring period.

This report presents results of nutrient, turbidity, bacteria, and Blue Green Algae parameters which are typical indicators used to assess degradation of urban streams. Analysis of all parameters monitored by this program will be presented in the annual report.

Georges River catchment sites are reported as Recreation sites (GR1, GR1.5, GR2, GR3, GR4 and GR5) and Georges River Tributaries (AC1, MC1, HC and WG). South Creek catchment sites are reported as South Creek (SC1 and SC2), Badgerys Creek (BC1), Kemps Creek (KC1, KC5, KC8, KC10, KC11 and KC12) and Kemps Creek Tributaries (KC2, KC3 and KC6).

Freshwater monitoring sites

Water quality was variable across all freshwater monitoring sites and all sites recorded degraded water quality and impairment typical of urban streams. The phrase ‘urban stream syndrome’ (Walsh et al. 2005) was coined to describe the multiple common symptoms occurring in urban streams, including degraded water quality, geomorphology, hydrology and biodiversity. All freshwater sites frequently recorded nutrient levels (phosphorous and nitrogen) that exceeded the Australian and New Zealand Environment Conservation Council (ANZECC) guidelines for fresh and marine water quality (2000). Other parameters, including turbidity, dissolved oxygen, pH and electrical conductivity, were also recorded to be outside the ANZECC 2000 water quality guidelines at the majority of sites at throughout the six-month monitoring period.

Total Nitrogen

Total nitrogen (TN) variations were constant across the Kemps Creek sites for the January 2023 to March 2023 period (Appendix 1). Results show that all sites recorded non-compliance to the ANZECC lowland river guideline for southeast Australia (0.35 mg/L). The highest concentration, 92.9 mg/L, was recorded at KC1 in March, which is approximately 270 times greater than the ANZECC guideline. TN remained at similar concentrations throughout the monitoring period. There was a spatial trend where sites in the upper catchment (KC1, KC5 and KC8) had increased TN concentrations than the sites further downstream (KC10, KC11 and KC12)

Total nitrogen was variable across Kemps Creek tributary sites (Appendix 1). All sites recorded non-compliance to the ANZECC lowland river guideline for southeast Australia (0.35 mg/L). KC6 recorded the

highest TN concentration of 78 mg/L in March 2023. These results are approximately 220 times higher than the recommended ANZECC guideline.

Total nitrogen within all sites of Georges River tributaries was fairly stable and did not comply with the ANZECC lowland river guideline for southeast Australia. The highest concentrations were recorded at both MC1 at 2.5 mg/L. TN recorded at AC1 was generally lower than HC and WG, however was still non-compliant with the ANZECC guideline during all sampling events within this biannual report.

Total nitrogen levels in sites within the South Creek catchment were variable and did not comply with the ANZECC guideline value of 0.35 mg/L during the monitoring period (Appendix 1). TN concentration was highest at SC1 in February reaching 3.3 mg/L. TN concentrations at BC1 and SC2 were generally lower than SC1.

Total phosphorous

Total phosphorous (TP) was consistently high across Kemps Creek sites, with no clear temporal trend evident (Appendix 1). All sites recorded non-compliance to the ANZECC lowland river guideline for southeast Australia of 0.025 mg/L. KC1 recorded the highest TP concentration of 9.33 mg/L in March 2023, approximately 370 times the guideline limit.

Kemps Creek tributary sites had elevated TP and did not comply to the ANZECC guideline (Appendix 1). KC6 recorded the highest concentration of TP (6.91 mg/L) in March 2023. KC2 and KC3 readings were relatively constant.

Georges River tributary sites had variable TP (Appendix 1). All sites were non-compliant to the ANZECC guideline of 0.025 mg/L. Maximum TP was recorded at HC was 0.28 mg/L in March 2023.

Total phosphorus concentrations at all South Creek catchment sites (SC1, SC2, and BC1) were variable and exceeded the ANZECC guideline for all monitoring events (Appendix 1). TP was highest at SC2 in March 2023, with a value of 0.94 mg/L.

Turbidity

During the monitoring quarterly monitoring period, turbidity across the waterways of Liverpool was variable, and complied to the ANZECC guideline of between 6 and 50 NTU, with the exception of BC1 in January (Appendix 1). The highest turbidity recorded was 60.2 NTU at SC2 in January 2023, followed by 29.9 NTU at KC2 in January 2023.

Recreation Monitoring Sites

Turbidity

Turbidity at freshwater sites was compliant with or below the ANZECC freshwater guidelines (6-50 NTU) during this sampling period. At the estuary sites, there was no compliance with the primary contact guideline of 0.5 NTU.

Faecal coliforms and Enterococci

Results of bacteria monitoring at the Georges River Recreation sites shows that breaches of the ANZECC primary and secondary contact guidelines occurred within in all months of this sampling period (Table 7).

Results of bacteria monitoring at recreation sites in January 2023 show that the ANZECC Primary Contact guidelines for Faecal coliforms was exceeded at GR1, GR2, GR3, and GR5, and The ANZECC Secondary Contact guidelines for Faecal coliforms was exceeded at GR1.5. The ANZECC Primary Contact guidelines for Enterococci was exceeded at GR1, GR1.5 and GR2. The ANZECC Secondary Contact guidelines for Enterococci was not exceeded at any of the Georges River Monitoring sites.

At GR1, GR1.5, and GR2, Faecal coliforms were recorded to be elevated since the last monitoring event, where the Faecal coliform had reduced at GR3, GR4, and GR5. Enterococci results show a reduction at GR1, GR3, GR4, and GR5 from the previous month, however, at GR1.5 and GR2 , Enterococci results have increased.

Results of bacteria monitoring at recreation sites in February 2023 show that the ANZECC Primary Contact guidelines for Faecal coliforms was exceeded at GR1, GR1.5, and GR3, and the ANZECC Secondary Contact guidelines for Faecal coliforms was exceeded at GR4. The ANZECC Primary Contact guidelines for Enterococci was exceeded at GR1, GR1.5 and GR5. The ANZECC Secondary Contact guidelines for Enterococci was exceeded at GR4.

Results of bacteria monitoring at recreation sites in March 2023 show that the ANZECC Primary Contact guidelines for Faecal coliforms was exceeded at GR1, GR1.5, GR2 and GR5. The ANZECC Secondary Contact guidelines for Faecal coliforms was exceeded at GR4. The ANZECC Primary Contact guidelines for Enterococci was exceeded at GR2, GR3 and GR5. The ANZECC Secondary Contact guidelines for Enterococci was exceeded at GR1 and GR1.5.

Cyanobacteria (Blue Green Algae)

Monitoring of Cyanobacteria (Blue Green Algae) show that all recreation sites are susceptible to Blue Green Algae blooms, and potentially toxic species of Blue Green Algae are commonly detected (Table 7). The highest NHMRC monitoring level is 'Red Level Action Mode' followed by the 'Amber Level Alert Mode' with 'Green Level Surveillance Mode' being the lowest level in the NHMRC (2008). Each monitoring level has a recommended response.

Blue Green Algae Biovolume calculations indicate levels recorded across Georges River Estuary monitoring sites triggered NHMRC (2008) monitoring level 'Green Level Surveillance Mode' (NHMRC 2008) was triggered at all sites on at least one occasion. In January the 'Green Level Surveillance Mode' was triggered at GR1.5, GR2 and GR4. The 'Amber Alert' was triggered at GR3 in January. In February, the 'Green Level Surveillance Mode' was triggered at GR1.5, GR2, GR3 and GR4. In March the 'Green Level Surveillance Mode' was triggered at GR5 while the 'Amber Alert' was triggered at GR3 and GR4.

Table 7: Data summary for recreation monitoring sites. Non-compliance to ANZECC (2000) primary guidelines is indicated in orange and secondary guidelines in red. NHMRC (2008) Blue Green Algae alert levels highlighted as per the a

Site	Date	<i>Faecal coliforms</i>	<i>Enterococci</i>	<i>Cyanobacteria</i>
		(cfu/100ml)	(cfu/100ml)	NHMRC Alert Level
GR1	January	320	40	-
	February	190	43	Green
	March	510	23000	-
GR1.5	January	1100	65	Green
	February	200	83	Green
	March	160	300	-
GR2	January	390	37	Green
	February	140	3	Green
	March	200	~110	-
GR3	January	170	33	Amber
	February	200	19	Green
	March	71	~110	Amber
GR4	January	42	6	Green
	February	13000	350	Green
	March	1800	13	Amber
GR5	January	320	6	-
	February	110	38	-
	March	750	160	Green

Table 8: NHMRC Blue Green Algae Levels and recommended response (NHMRC 2008).

NHMRC MONITORING LEVEL	RECOMMENDED RESPONSE
SURVEILLANCE MODE (GREEN LEVEL)	This level involves routine sampling to measure contaminants (e.g. physical, microbial, cyanobacterial and algal).

ALERT MODE (AMBER LEVEL)	This level requires investigation into the causes of elevated contaminant levels, and increased sampling to enable a more accurate assessment of the risks to recreational users.
ACTION MODE (RED LEVEL)	This level requires the local government authority and health authorities to warn the public that the water body is considered unsuitable for recreational use.

Conclusion

It is evident that most freshwater sites across the Liverpool LGA have elevated nutrient levels, often at orders of magnitude higher than the recommended ANZECC guidelines. Elevated nutrients in the urban and peri-urban setting are commonly sourced from stormwater run-off, sewer leakage or other wastewater sources, fertiliser contamination and decay of organic material. This program cannot quantify the source of the elevated results continually recorded across the Kemps Creek sites; however, likely drivers include the combination of flow conditions and the decay of organic matter, and increased stormwater runoff due to high rainfall and the flooding events.

Results of monitoring at Georges River freshwater sites shows elevated nutrient concentrations were apparent for most of the monitoring period, the source of which is likely elevated stormwater runoff.

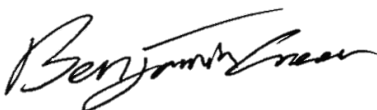
Monitoring of the Georges River estuary sites show bacteria levels were frequently elevated above the ANZECC (2000) Primary Contact levels, and at times above Secondary Contact levels, particularly after the flooding events that occurred prior.

Statistical analysis of data collected by the monitoring program will be undertaken and presented in the annual report and program recommendations will be made.

All data has been supplied in an Excel spreadsheet separate this report and no safety issues were recorded/observed during monitoring.

If you have any questions, please get in touch.

Kind regards,



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Appendix 1

Table 1: Water quality results from the sampling period January to March 2023.

SITE	DATE	PH	EC	DISSOLVED OXYGEN	TURBIDITY	AMMONIA -N	NOX- N	TKN	TOTAL NITROGEN	TOTAL PHOSPHORUS	REACTIVE PHOSPHORUS
AC1	27/01/2023	7.96	244	43.3	1.13	0.005	0.02	0.6	0.6	0.06	0.005
AC1	6/02/2023	7.92	367	50.5	6.85	0.005	0.02	0.5	0.5	0.04	0.005
AC1	10/03/2023	7.49	404	35	2.1	-	-	-	-	-	-
MC1	27/01/2023	7.97	1009	93.9	2.27	0.03	0.05	0.7	0.8	0.04	0.005
MC1	6/02/2023	8.12	1161	109.3	1.83	0.04	0.10	1.0	1.1	0.08	0.02
MC1	10/03/2023	8.11	1773	84.8	19.05	1.64	0.32	2.2	2.5	0.09	0.005
KC1	27/01/2023	7.45	1056	53.6	3.66	0.10	21.6	7.9	29.5	4.34	3.65
KC1	6/02/2023	7.75	1325	86.5	2.16	0.02	21.4	4.1	25.5	4.40	4.12
KC1	10/03/2023	7.83	1713	43.2	1.48	0.09	61.2	31.7	92.9	9.33	8.85
KC2	27/01/2023	7.52	973	48.1	29.9	0.02	0.04	0.9	0.9	0.14	0.06
KC2	6/02/2023	7.56	1198	45.3	26.8	0.005	0.03	0.9	0.9	0.20	0.09
KC2	10/03/2023	7.61	2053	15.4	8.98	0.03	0.02	1.0	1.0	0.34	0.11
KC3	27/01/2023	7.66	697	57.2	4.5	0.03	0.26	0.7	1.0	0.33	0.25
KC3	6/02/2023	7.88	1322	67.8	1.44	0.005	0.17	0.6	0.8	0.11	0.08
KC3	10/03/2023	7.92	2083	47	6.46	0.03	0.77	0.8	1.6	0.11	0.06
KC5	27/01/2023	7.64	1277	63.8	12.87	0.01	0.07	0.6	0.7	0.14	0.05
KC5	6/02/2023	7.81	2083	71.4	11.99	0.005	0.005	0.8	0.8	0.08	0.02
KC5	10/03/2023	8.21	6100	49.4	2.05	0.05	55.0	16.6	71.6	6.60	6.24
KC6	27/01/2023	7.55	966	61.3	6.73	0.08	5.59	2.8	8.4	2.06	1.62
KC6	6/02/2023	7.8	1209	73.2	12.32	0.03	8.84	3.0	11.8	2.72	2.71
KC6	10/03/2023	7.98	1969	44.7	8.15	0.04	55.6	22.4	78.0	6.91	6.39
KC8	27/01/2023	7.65	1157	37.1	35.7	0.09	3.11	2.2	5.3	0.72	0.61
KC8	6/02/2023	8.03	2123	100.9	10.09	0.03	3.04	1.6	4.6	0.84	0.72

Liverpool Aquatic Ecosystem Monitoring 2023 – 2023

KC8	10/03/2023	8.32	5830	102.9	7.11	0.06	18.1	4.4	22.5	2.03	2.01
KC10	27/01/2023	7.7	851	40.4	15.99	0.05	1.46	1.2	2.7	0.46	0.37
KC10	6/02/2023	7.58	1180	30.4	14.66	0.11	0.63	1.2	1.8	0.68	0.50
KC10	10/03/2023	7.65	2323	27.2	6.84	0.13	2.27	1.2	3.5	0.54	0.51
KC12	27/01/2023	7.51	984	43.6	20.2	0.04	1.35	1.3	2.6	0.48	0.34
KC12	6/02/2023	7.52	1162	48.2	11.87	0.14	0.49	3.9	4.4	1.19	0.42
KC12	10/03/2023	7.56	1596	34.5	6.72	0.03	0.67	1.6	2.3	0.70	0.38
SC1	27/01/2023	7.72	567	52.3	54.3	0.09	0.89	1.1	2.0	0.26	0.05
SC1	6/02/2023	7.65	679	50.1	29.9	0.07	1.37	1.9	3.3	0.44	0.11
SC1	10/03/2023	7.69	899	48.6	9.26	0.06	0.56	1.1	1.7	0.20	0.10
SC2	27/01/2023	7.63	817	33.1	28.9	0.01	0.11	1.0	1.1	0.15	0.01
SC2	6/02/2023	7.81	667	37.6	73.1	0.09	0.43	0.9	1.3	0.24	0.02
SC2	10/03/2023	8.9	1490	18.3	5.69	0.07	0.01	2.8	2.8	0.94	0.03
BC1	27/01/2023	8.13	1367	50.1	60.2	0.02	0.19	1.1	1.3	0.14	0.005
BC1	6/02/2023	7.65	1702	45.2	10.97	0.005	0.005	0.9	0.9	0.14	0.005
BC1	10/03/2023	7.7	1881	49.7	5.37	0.03	0.005	1.0	1.0	0.08	0.005
WG	27/01/2023	9.72	173.2	100.4	1.94	0.01	0.005	0.8	0.8	0.07	0.005
WG	6/02/2023	9.18	140.3	92.4	11.75	0.005	0.02	0.5	0.5	0.04	0.005
WG	10/03/2023	8.3	199	64.3	1.43	0.02	0.01	0.8	0.8	0.11	0.07
HC	27/01/2023	7.63	660	30.8	1.24	0.04	0.16	0.5	0.7	0.06	0.005
HC	6/02/2023	7.64	955	9.7	1.17	0.06	0.01	0.9	0.9	0.17	0.02
HC	10/03/2023	7.68	1331	11.8	2.33	0.20	0.01	1.0	1.0	0.28	0.02
AC1	27/01/2023	7.96	244	43.3	1.13	0.005	0.02	0.6	0.6	0.06	0.005
AC1	6/02/2023	7.92	367	50.5	6.85	0.005	0.02	0.5	0.5	0.04	0.005
AC1	10/03/2023	7.49	404	35	2.1	-	-	-	-	-	-