SYDNEY GATEWAY

A Joint Venture Project

JOHN HOLLAND SEYMOUR WHYTE

Construction Monitoring Report - Landfill Leachate Gas and Odour

March 2022

Project: Sydney Gateway Road Project

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		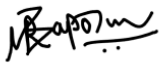	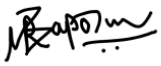		

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1.0 Introduction

The purpose of this report is to summarise the findings of the monthly construction monitoring program detailed within the Landfill Leachate, Gas, and Odour Management Plan (LLGOMP).

Note – this report has been developed specifically for monitoring conducted within NSW State owned land under approval SSI 9737, which is administered by the NSW Department of Planning, Industry and Environment (DPIE).

The monitoring period of this report is 1st March 2022 to 31st March 2022.

2.0 Leachate Monitoring

Results from monitoring have been compared against the criteria stipulated within the LLGOMP. There are two elements to landfill leachate monitoring:

- Leachate seep sampling
- Leachate monitoring well program

2.1 Leachate Seep Sampling

Where a leachate seep or discharge is identified with the potential to leave the site, and there is sufficient volume being generated that has the potential to migrate off site and the location is safe to access (and there is not an immediate risk to human health or the environment), it is to be sampled by an appropriately qualified person and that sample submitted under chain of custody documentation to a NATA accredited laboratory.

During the reporting period, regular site inspections were undertaken in accordance with the Landfill Leachate Monitoring Program. On 24 March 2022 John Holland Seymour Whyte contacted the NSW EPA to advise that leachate was overtopping the bentonite wall at the former Tempe landfill within EPL 21524. The overtopping of the bentonite wall was caused by heavy rainfall received at the former Tempe Landfill between 23 February 2022 and 23 March 2022 and flooding of the Alexandra Canal on 2 & 3 March 2022.

Water samples taken from upwellings from a disused groundwater monitoring well, leachate pit two and surface flows and submitted to a NATA accredited laboratory for analysis which recorded elevated ammonia levels confirming that the overtopping was leachate.

A review of the operation and maintenance of the leachate collection system identified that it was being operated to maximise the treatment and disposal of leachate with no major plant or equipment failures. Leachate treatment and discharge occurred consistently in line with expected discharge volumes and were slightly increased in response to the rainfall event.

As there is a recognised pre-existing condition at the former Tempe landfill where leachate overtops the bentonite wall during rain events JHSW does not consider that the overtopping event identified on 24 March 2022 constitutes an incident.

The event was reported to the NSW EPA Pollution Line on 24 March 22022 followed by an information report submitted to the EPA, TfNSW, ER and site auditor on 6 April 2022, refer to Appendix A for a copy of the information report.

2.2 Leachate Monitoring Well Program

During the March sampling round there was a sampling error that resulted in TRH, BTEX, PAH, Polyfluoroalkyl substances and dissolved methane not being analysed, the remained of the analytes in the monitoring wells were sampled in accordance with the leachate analyte criteria detailed in Appendix A of the LLGOMP. The Location of monitoring wells are shown in Figure 1. The adopted analyte suite is listed in Table 1. Data captured during monitoring was assessed against the baseline groundwater quality maxima as detailed in Table 2.

Wells GW7, GW8, MPI_13 and MPE_21 were not sampled during the reporting period as they were either lost or destroyed as part of ongoing earthworks within former Tempe landfill as the wells are located within the new road alignment and ATL. JHSW is currently working through any necessary action regarding the sampling of alternative wells or the installation of new wells. JHSW have proposed to the ER and contaminated site auditor that GW8 be replaced in a new suitable location, and that GW28a will be sampled in place of GW7. New location for MPI_13 will be assessed once works are completed in this area. In principle agreement for the new locations has been obtained, management plans need to be updated to reflect the change and approved.

As reported during February report MPE_7 and MPE_11 recorded elevated Total Phosphorus levels, additional monitoring undertaken on 10 March 2022 and 23 March 2022 returned results well below trigger levels MPE_7, 1.05mg/l & 0.61mg/l and MPE_11, 1.39mg/l & 0.66mg/l respectively. Monitoring was not undertaken on 28 March as reported in February 2022 report as two rounds of monitoring had already occurred in accordance with the LLGOMP. As the additional monitoring was undertaken during an extended heavy rain event the results do not show a clear correlation between internal and external wells. Total Phosphorus concentrations in external monitoring will continue to be monitored.

During March well MPE_5 recorded an ammonia level of 96.2mg/l which is above the trigger level, the result was compared against the closest internal well MPI_10 which recorded a result of 88.1mg/l. The nutrient results for MPE_5 and MPE_10 were also compared and found to be similar with the exception of Total Phosphorus which was 1.02mg/l at MPE_5 and 11.1mg/l at MPE_10. While not conclusive it is likely that overtopping of the bentonite wall has occurred during March as a result of the recent heavy rainfall as report to the NSW EPA in late March 2022.

As reported above a review of the operation and maintenance of the leachate collection system identified that it was being operated to maximise the treatment and disposal of leachate with no major plant or equipment failures. Leachate treatment and discharge occurred consistently in line with expected discharge volumes and were slightly increased in response to the rainfall event. At this stage there are no additional mitigation measures planned to be implemented to minimise overtopping beyond the continued maximisation of the operation of the leachate treatment plant and ongoing monthly sampling.

Figure 1, Leachate monitoring well sampling locations.

Table 1 Adopted Analyte Suites from LLGOMP

Analysis	Background Level (Outside bentonite wall) (mg/L)	Trigger Level (Outside Bentonite Wall) (mg/L)
Ammonia	85.5	95
Phosphorus as P	2.88	3.2
Nitrate	4.86	5.4
Nitrite	0.27	0.3
Total recoverable hydrocarbons (TRH)1	2.16	2.4
Benzene, toluene, ethylbenzene and xylenes (BTEX)2	-	Not detected – defer to ANZG, 20184 (0.91)
Polycyclic aromatic hydrocarbons (PAH)	0.01386	0.0154
Per and poly fluoro alkyl substances (PFAS) (PFOS, PFOA, PFHxS and FTSA only3	0.00144	0.00160
Dissolved methane.	12.87	14.3

[1] Combined total of each individual TRH fraction (C_6-C_{10}, C_{10}-C_{16}, C_{16}-C_{34}, and C_{34}-C_{40})
[2] Combined total of each individual BTEX parameter (Benzene, toluene, ethylbenzene and xylenes)
[3] Combined total of PFAS, PFOS, PFHxS, and FTSA[4] Based on 90% species protection in freshwater environments

Table 2 Leachate Monitoring Results

Analyte	Units	LLGOMP Background Level	Trigger[1]	MPE_2	MPE_4	MPE_5	MPI_10	MPE_5A	MPE_7	MPE_11
Ammonia	mg/L	85.5	95	9.39	17.4	96.2	88.1	3.64	54.7	48.2
Nitrate	mg/L	4.86	5.4	0.1	<0.01	0.01	0.01	0.82	0.16	0.02
Nitrite	mg/L	0.27	0.3	<0.01	0.07	<0.01	<0.01	0.03	0.08	<0.01
Total Phosphorus as P	mg/L	2.88	3.2	0.94	1.08	1.02	11.1	1.28	1.05	1.39
TRH	mg/L	2.16	2.4	-	-	-	-	-	-	-
BTEX	mg/L	-	0.91	-	-	-	-	-	-	-
Polycyclic aromatic hydrocarbons (PAH). total	mg/L	0.01386	0.0154	-	-	-	-	-	-	-
Per and poly fluoro alkyl substances (PFAS) (PFOS, PFOA, PFHxS and FTSA only	µg/L	1.44	1.60	-	-	-	-	-	-	-
Dissolved methane.	mg/L	12.87	14.3	-	-	-	-	-	-	-

Note: 1 Trigger level is only applicable to external wells

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3.0 Landfill Gas Monitoring

Two forms of landfill gas monitoring are undertaken during the works on site to review potential impacts from landfill has generation on surrounding receivers and onsite workers. These include the following:

- Daily/regular monitoring of pits, excavations and boring/piling operations.
- Monthly sub-surface, structure/enclosed space monitoring.

3.1 Daily/regular monitoring of pits, excavations, and boring/piling operations

This monitoring takes place while ground-breaking, excavation, boring or piling works are taking place across the works area within the former Tempe Landfill. Results of gas monitoring are displayed in Table 3. All results were recorded below the adopted trigger levels. No reportable concentrations of methane were identified.

Table 3 Monitoring of site excavations, pits and piling

Date (dd/mm/yy)	Time (24 hour)	Wind Direction & Speed (km/h)	Location	CH4/Flammable Gases (ppm)	OXY Vol %	PID - IBL (ppm)	CO2 (%v/v)	CO (ppm)	H2S (ppm)	Comments
01/03/2022	7:23	E 28	Cut 3 - Excavation	120	20.9	0	0	0	0	CMC Piling, wet weather preparation - excavators
01/03/2022	7:24	E 28	Cut 3 - Excavation	125	20.9	0	0	0	0	CMC Piling, wet weather preparation - excavators
02/03/2022			Heavy Rain							
03/03/2022			Heavy Rain							
04/03/2022			Intermittent Rain							
07/03/2022			Intermittent Rain							
08/03/2022			Heavy Rain							
09/03/2022	12:00	SSW 50	Cut 1	0	20.9	0	0	0	0	Moxy, excavator, Vac Truck, Piling rig
09/03/2022	12:03	SSW 50	Cut 1	15	20.9	0	0	0	0	Moxy, excavator, Vac Truck, Piling rig
10/03/2022	11:54	SSW 28	Cut 3	0	20.9	0	0	0	0	CMC piling cut 3, moxies/excavators
10/03/2022	11:55	SSW 28	Cut 3	0	20.9	0	0	0	0	CMC piling cut 3, moxies/excavators
10/03/2022	11:58	SSW 28	Cut 3	15	20.9	0	0	0	0	CMC piling cut 3, moxies/excavators
11/03/2022	13:00	S 24	Golf range Piling	15	20.9	0	0	0	0	CMC piling, excavators, moxies, agis
11/03/2022	13:01	S 24	Golf range Piling	10	20.9	0	0	0	0	CMC piling, excavators, moxies, agis
11/03/2022	13:04	S 24	Cut 3 excavation	5	20.9	0	0	0	0	CMC piling, excavators, moxies, agis
11/03/2022	13:06	S 24	Cut 3 excavation	10	20.9	0	0	0	0	CMC piling, excavators, moxies, agis

Date (dd/mm/yy)	Time (24 hour)	Wind Direction & Speed (km/h)	Location	CH4/Flammable Gases (ppm)	OXY Vol %	PID - IBL (ppm)	CO2 (%v/v)	CO (ppm)	H2S (ppm)	Comments
16/03/2022	8:42	SW 11	Golf range Piling 1	10	20.9	0	0	0	0	Piling in golf range, Cut 3 piling, concrete agis
16/03/2022	8:43	SW 11	Golf range Piling 2	15	20.9	0	0	0	0	Piling in golf range, Cut 3 piling, concrete agis
16/03/2022	8:49	SW 11	Cut 3 Piling	20	20.9	0	0	0	0	Piling in golf range, Cut 3 piling, concrete agis
16/03/2022	8:51	SW 11	Cut 3 Piling	25	20.9	0	0	0	0	Piling in golf range, Cut 3 piling, concrete agis
16/03/2022	8:53	SW 11	Cut 3 Piling	15	20.9	0	0	0	0	Piling in golf range, Cut 3 piling, concrete agis
17/03/2022	8:36	WNW 17	Cut 3 - Pile	0	20.9	0	0	0	0	Moxies/Excavators. Piling at golf range and cut 3
17/03/2022	8:37	WNW 17	Cut 3 - Pile	0	20.9	0	0	0	0	Moxies/Excavators. Piling at golf range and cut 3
17/03/2022	8:38	WNW 17	Golf range piling	0	20.9	0	0	0	0	Moxies/Excavators. Piling at golf range and cut 3
18/03/2022	9:07	NW 7	Cut 3 Piling 1	0	20.9	0	0	0	0	CMC Piling @ Cut 3 Golf range piling
18/03/2022	9:09	NW 7	Cut 3 Piling 2	15	20.9	0	0	0	0	CMC Piling @ Cut 3 Golf range piling
18/03/2022	9:10	NW 7	Cut 3 Piling 3	10	20.9	0	0	0	0	CMC Piling @ Cut 3 Golf range piling
18/03/2022	9:13	NW 7	Golf range piling	5	20.9	0	0	0	0	CMC Piling @ Cut 3 Golf range piling
21/03/2022	13:47	SSE 19	Golf range Piling	0	20.9	0	0	0	0	Golf Range Pile. CMC Piling @ Cut 3
21/03/2022	13:55	SSE 19	Piling cut 3	0	20.9	0	0	0	0	Golf Range Pile. CMC Piling @ Cut 3

Date (dd/mm/yy)	Time (24 hour)	Wind Direction & Speed (km/h)	Location	CH4/Flammable Gases (ppm)	OXY Vol %	PID - IBL (ppm)	CO2 (%v/v)	CO (ppm)	H2S (ppm)	Comments
21/03/2022	13:57	SSE 19	Piling cut 3	10	20.9	0	0	0	0	Golf Range Pile. CMC Piling @ Cut 3
21/03/2022	14:01	SSE 19	Piling cut 3	5	20.9	0	0	0	0	Golf Range Pile. CMC Piling @ Cut 3
22/03/2022	9:04	WNW 13	Cut 2	5	20.9	0	0.02	0	0	Earth works Cut 2
22/03/2022	9:06	WNW 13	Cut 2	0	20.9	0	0.02	0	0	Earth works Cut 2
22/03/2022	9:07	WNW 13	Cut 1	10	20.9	0	0.02	0	0	Earth works Cut 1 - Piling
23/03/2022	8:25	S 33	Cut 1 Piling	5	20.9	0	0.02	0	0	Crane opertating C3 Carpark. Moxies, excavators, Agis
23/03/2022	8:26	S 33	Cut 1	0	20.9	0	0.02	0	0	Crane opertating C3 Carpark. Moxies, excavators, Agis
23/03/2022	8:28	S 33	Cut 1	10	20.9	0	0.02	0	0	Crane opertating C3 Carpark. Moxies, excavators, Agis
24/03/2022	7:20	SW 32	Cut 1 Piling	5	20.9	0	0.02	0	0	Crane opertating C3 Carpark. Moxies, excavators, Agis
24/03/2022	7:22	SW 33	Cut 1	0	20.9	0	0.02	0	0	Crane opertating C3 Carpark. Moxies, excavators, Agis
24/03/2022	7:30	SW 34	Cut 1	10	20.9	0	0.02	0	0	Crane opertating C3 Carpark. Moxies, excavators, Agis
25/03/2022	8:41	SSW 11	Cut 2 Excavation	0	20.9	0	0	0	0	Piling @ cut 2. Moxies/Excavators rubbish mound

Date (dd/mm/yy)	Time (24 hour)	Wind Direction & Speed (km/h)	Location	CH4/Flammable Gases (ppm)	OXY Vol %	PID - IBL (ppm)	CO2 (%v/v)	CO (ppm)	H2S (ppm)	Comments
25/03/2022	8:48	SSW 11	Cut 2 Excavation/Piling	0	20.9	0	0	0	0	Piling @ cut 2. Moxies/Excavators waste mound
26/03/2022			Intermittent Rain							
27/03/2022			Intermittent Rain							
28/03/2022			Intermittent Rain							
29/03/2022			Intermittent Rain							
30/03/2022	14:11	S 35	Cut 3	15	20.9	0	0	0	0	Piling rig, agis, moxies
30/03/2022	14:13	S 35	Cut 3	10	20.9	0	0	0	0	Piling rig, agis, moxies
31/03/2022			Intermittent Rain							

3.2 Monthly Landfill gas monitoring

Monthly gas monitoring of the sub-surface wells including gas accumulation monitoring in offsite buildings was undertaken at locations shown in Figure 2. Results of monitoring are detailed in Table 4.

Results indicate notable methane concentrations in monitoring wells GW9A and GW14 which are both situated inside the landfill boundary therefore the trigger levels presented in Table 4 do not apply to these wells. Methane was not detected at any of the locations outside of the landfill footprint.

Carbon dioxide concentrations were detected at all locations within the landfill footprint with the highest concentration reported at GW14 with 15.7 %v/v. All other parameters were recorded below the adopted trigger levels. Stabilised gas flow rates ranged was 0.0 L/hr except for GW14 which recorded 0.4 L/hr. Carbon dioxide concentrations were recorded above the trigger level in gas wells GW1A, GW5A, GW16 and GW19A. All other parameters were recorded below the adopted trigger levels.

In accordance with the Landfill Gas Risk Assessment (LFGRA) and LLGOMP, a comparison of the flow, methane, and carbon dioxide ranges and corresponding gas situation between the LFGRA and current datasets was undertaken. Gas readings collected from each well was compared against the gas screening criteria for each representative Monitoring Zones depicted in Figure 3. Results are presented in Table 5. The results demonstrate that the March 2022 data is within the flow and concentrations ranges identified within the historical dataset and therefore considered to present minimal risk to the targeted receptors. Updated Risk Classifications and concentrations are also presented in Table 5, the updated risk classification and concentrations will be used as trigger levels in future monitoring rounds.

Gas accumulation monitoring was also undertaken within onsite buildings and the three nominated offsite assessment locations shown in Figure 2. All readings were compliant with the adopted assessment criteria.

Figure 2: Monthly offsite landfill gas monitoring locations

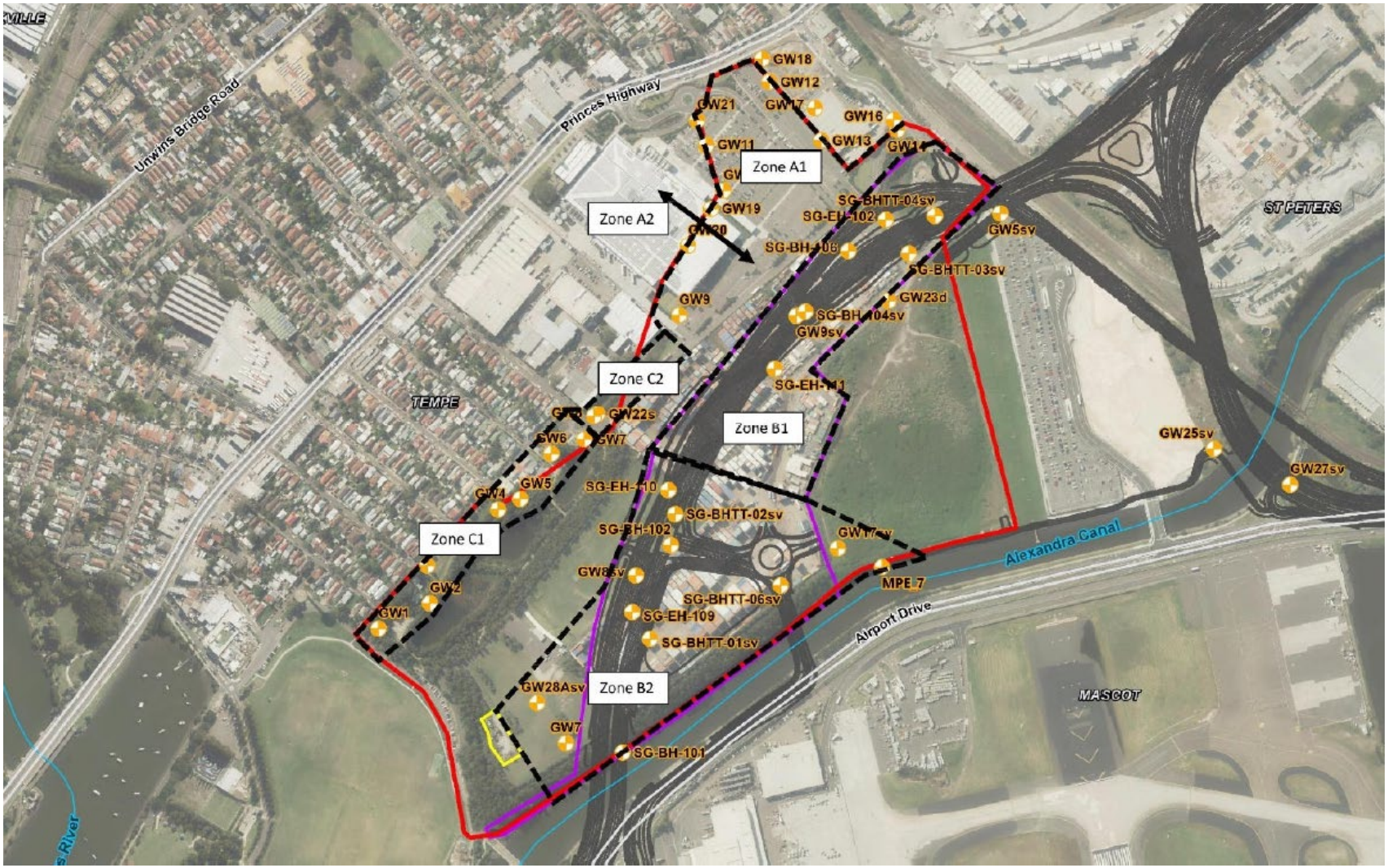


Figure 3 – Gas Monitoring Zones

Table 4 Monthly offsite subsurface gas monitoring results

			Flow (Stabilised)	Relative Pressure (Stabilised)	Methane (Stabilised)	Carbon Dioxide (Stabilised)	Oxygen (Stabilised)	Carbon Monoxide (Stabilised)	Hydrogen Sulfide (Stabilised)	Depth to Groundwater	Barometer
			L/hr	mb	%	%	%	ppm	ppm	mBTOC	mb
LLGOMP Gas Assessment Criteria			-	-	1	5.0	-	30	10		
Location	**Zone**	**Date**									
GW9	Zone A1	11-Mar-22	0	0	0	0.1	20.4	0	0	18.28	1019
GW9A	Zone A1	11-Mar-22	0	0	22.5	7.4	1.1	0	5	7.56	1019
GW14	Zone A1	11-Mar-22	0.4	1	10	15.7	0	0	0	4.35	1020
JHSW-LFG01	Zone A1	11-Mar-22	0	0	0	1.7	15.2	0	0	0.78	1019
GW11A	Zone A2	11-Mar-22	0	0	0	1.9	0.1	0	0	Dry	1019
GW16	Zone A2	11-Mar-22	0	0	0	16.2	1.6	0	0	Dry	1019
GW17	Zone A2	11-Mar-22	0	0	0	0.1	20.2	0	0	1.73	1019
GW19A	Zone A2	11-Mar-22	0	0	0	9.6	7.8	0	0	7.6	1019
GW1A	Zone C1	11-Mar-22	0	0	0	5.4	16.3	0	0	0.95	1019
GW2	Zone C1	11-Mar-22	0	0	0	0.3	20.7	0	0	1.78	1019
GW3	Zone C1	11-Mar-22	0	0	0	4.9	14.7	0	0	2.16	1019
GW4A	Zone C1	11-Mar-22	0	0	0	0.2	20.3	0	0	0.45	1019
GW5A	Zone C1	11-Mar-22	0	0	0	6.1	12.1	0	0	2.97	1019
GW6A	Zone C1	11-Mar-22	0	0	0	3.1	8.8	0	0	1.52	1019
GW22s	Zone C2	11-Mar-22	0	0	0	4.6	19.5	0	0	3.67	1020
JHSW-LFG02	Zone C2	11-Mar-22	0	0	0	0	0	0	0	Dry	1019

Table 5 Data comparison between LFGRA and March 2022 sampling results

Zone	Max Flow (L/hr)	Max CH4 (%v/v)	Max CO2 (%v/v)	GSV CH4 (L/hr)	GSV CO2 (L/hr)	CS	Risk Class (NSW EPA)
A1 LFGRA	5.8	54.7	22	3.17	1.28	3	Moderate
A1 Mar 22 (Round 7)	0.4	22.5	15.7	0.09	0.063	2	Low
A2 LFGRA	1.8	5.6	19.8	0.1	0.36	2	Low
A2 Mar 22 (Round 7)	0.1*	0	16.2	0	0.016	1	Very Low
C1 LFGRA	0.1	0.2	17.4	0.0002	0.02	1	Very Low
C1 Mar 22 (Round 7)	0.1*	0	6.1	0	0.006	1	Very Low
C2 LFGRA	0.9	0	0.8	0	0	1	Very Low

* Where flow is zero, the instrument detection limit of 0.1 l/hr has been adopted.

Table 6 Monthly gas accumulation monitoring

Location	Type of Monitoring Point	Methane Limit	Results (Stabilised)
C3 compound office[1]	Gas Accumulation Monitoring	500ppm	<3 (LOR)
C3 lunchroom[1]	Gas Accumulation Monitoring	500ppm	<3 (LOR)
OSA1[2]	Gas Accumulation Monitoring	500ppm	<3 (LOR)
OSA2[2]	Gas Accumulation Monitoring	500ppm	<3 (LOR)
OSA3[2]	Gas Accumulation Monitoring	500ppm	<3 (LOR)

1 Monitoring location within project site on the Former Tempe Landfill
2 Monitoring location outside the project site

3.3 Odour Monitoring

Odour monitoring was undertaken during the reporting period. All active work areas and stockpiles onsite were inspected twice daily, as well as the site boundary. Where odour was recorded at >2OU at the site boundary, offsite monitoring was undertaken downwind at the most effected receiver depicted in Figure 4. Odour monitoring results are detailed within Table 7.

Generally, no odours >2OU were detected onsite or at the site boundary during monitoring. Mild odour was detected around waste material stockpiles and Cut 1 excavation. However, they were not distinguishable above 2 OU at the source of odour, or at the project boundary using a calibrated nasal ranger and were therefore not recorded as a notable detection.

No community complaints relating to odour were received during the reporting period.

Figure 4, Indicative offsite odour monitoring locations

Table 7 Odour monitoring undertaken during the March reporting period

Date	Time	Location	Wind Direction	Wind Speed	Odour (OU) Criteria: >20U	Work Activities Occurring
01/03/2022	7:00	All Areas (1-11)	E	28	**<2**	Bridge CMC Piling, minor earth works - intermittent rain
01/03/2022	15:30	All Areas (1-11)	E	32	**<2**	Bridge CMC Piling, minor earth works - intermittent rain
02/03/2022	8:00	All Areas (1-11)	E	35	**<2**	Heavy rain - no works
02/03/2022	14:45	All Areas (1-11)	ENE	22	**<2**	Heavy rain - no works
03/03/2022	7:45	All Areas (1-11)	SE	17	**<2**	Heavy rain - no works
03/03/2022	14:45	All Areas (1-11)	SE	38	**<2**	Heavy rain - no works
04/03/2022	9:00	All Areas (1-11)	SSE	22	**<2**	Minor earthworks - intermittent rain
04/03/2022	15:30	All Areas (1-11)	SE	24	**<2**	Minor earthworks - intermittent rain
07/03/2022	7:30	All Areas (1-11)	ESE	28	**<2**	Minor earthworks - intermittent rain
07/03/2022	15:00	All Areas (1-11)	ESE	24	**<2**	Minor earthworks - intermittent rain
08/03/2022	9:00	All Areas (1-11)	SSW	41	**<2**	Heavy rain - no works
08/03/2022	15:30	All Areas (1-11)	SSW	54	**<2**	Heavy rain - no works
09/03/2022	7:30	All Areas (1-11)	SSW	46	**<2**	Moxy, excavator, Vac truck, piling rig
09/03/2022	15:00	All Areas (1-11)	SSW	48	**<2**	Moxy, excavator, Vac truck, piling rig
10/03/2022	7:00	All Areas (1-11)	WSW	20	**<2**	Earth works - CMC piling cut 3, moxies, excavators
10/03/2022	14:30	All Areas (1-11)	S	30	**<2**	Earth works - CMC piling cut 3, moxies, excavators
11/03/2022	8:00	All Areas (1-11)	SW	28	**<2**	CMC piling cut 3 and golf range, moxies, excavators
11/03/2022	14:30	All Areas (1-11)	SSE	22	**<2**	CMC piling cut 3 and golf range, moxies, excavators
14/03/2022	8:00	All Areas (1-11)	SW	28	**<2**	CMC piling cut 3 and golf range, moxies, excavators
14/03/2022	15:00	All Areas (1-11)	SSW	48	**<2**	Moxy, excavator, Vac truck, piling rig
15/03/2022	9:00	All Areas (1-11)	SSE	22	**<2**	Minor earthworks - intermittent rain

Date	Time	Location	Wind Direction	Wind Speed	Odour (OU) Criteria: >20U	Work Activities Occurring
15/03/2022	15:30	All Areas (1-11)	SE	24	**<2**	Minor earthworks - intermittent rain
16/03/2022	8:00	All Areas (1-11)	SW	13	**<2**	Piling at cut 3 and golf range. Earthworks at rubbish mound
16/03/2022	14:30	All Areas (1-11)	ESE	7	**<2**	Piling at cut 3 and golf range. Earthworks at rubbish mound
17/03/2022	9:00	All Areas (1-11)	WSW	31	**<2**	
17/03/2022	14:30	All Areas (1-11)	SSE	20	**<2**	
18/03/2022	8:30	All Areas (1-11)	WNW	26	**<2**	CMC Piling at Cut 1, 3 and golf range
18/03/2022	15:00	All Areas (1-11)	SSE	20	**<2**	CMC Piling at Cut 1, 3 and golf range
21/03/2022	7:30	All Areas (1-11)	SSE	31	**<2**	Piling at golf range and cut 3
21/03/2022	15:00	All Areas (1-11)	SSE	28	**<2**	Piling at golf range and cut 3
22/03/2022	8:00	All Areas (1-11)	W	13	**<2**	Piling and earthworks around cuts 1, 2 and 3
22/03/2022	15:00	All Areas (1-11)	SSE	15	**<2**	Piling and earthworks around cuts 1, 2 and 3
23/03/2022	9:30	All Areas (1-11)	NW	13	**<2**	Excavators and material movement around rubbish mound
23/03/2022	14:30	All Areas (1-11)	S	26	**<2**	Piling at golf range and cut 3
24/03/2022	8:00	All Areas (1-11)	WNW	9	**<2**	Piling at golf range and cut 3
24/03/2022	15:30	All Areas (1-11)	ESE	13	**<2**	Piling at golf range and cut 3
25/03/2022	7:30	All Areas (1-11)	SWS	11	**<2**	Agis and piling rigs
25/03/2022	15:00	All Areas (1-11)	S	20	**<2**	Agis and piling rigs
28/03/2022	8:30	All Areas (1-11)	NW	6	**<2**	Piling at golf range and cut 3 area
28/03/2022	15:45	All Areas (1-11)	SE	17	**<2**	Piling at golf range and cut 3 area
29/03/2022	7:30	All Areas (1-11)	S	20	**<2**	Limited works - intermittent rain
29/03/2022	15:30	All Areas (1-11)	SE	9	**<2**	Limited works - intermittent rain
30/03/2022	8:00	All Areas (1-11)	S	24	**<2**	Limited works - intermittent rain

Date	Time	Location	Wind Direction	Wind Speed	Odour (OU) Criteria: >20U	Work Activities Occurring
30/03/2022	15:00	All Areas (1-11)	S	39	**<2**	Limited works - intermittent rain
31/03/2022	7:30	All Areas (1-11)	SSW	35	**<2**	Limited works - intermittent rain
31/03/2022	14:45	All Areas (1-11)	SSE	52	**<2**	Limited works - intermittent rain

4.0 Conclusions

Monitoring was conducted during the March 2022 reporting period in accordance with the LLGOMP. In general, results have been found to be compliant with historic sampling events.

On 24 March 2022 John Holland Seymour Whyte contacted the NSW EPA to advise that leachate was overtopping the bentonite wall at the former Tempe landfill within EPL 21524. The overtopping of the bentonite wall was caused by heavy rainfall received at the former Tempe Landfill between 23 February 2022 and 23 March 2022 and flooding of the Alexandra Canal on 2 & 3 March 2022.

Monitoring for elevated Total Phosphorus levels recorded during February 2022 did not show a clear correlation between internal and external wells with results potentially being influenced by recent extended heavy rainfall. Total Phosphorus concentrations in external monitoring wells will continue to be monitored.

During March well MPE_5 recorded an elevated ammonia level above the trigger level, when compared against the closest internal well MPI_10 results were found to be similar with the exception of Total Phosphorus. While the results were not conclusive it is likely that overtopping of the bentonite wall has occurred during March as a result of the recent heavy rainfall as reported to the NSW EPA in late March 2022.

A review of the operation and maintenance of the leachate collection system identified that it was being operated to maximise the treatment and disposal of leachate with no major plant or equipment failures. Leachate treatment and discharge occurred consistently in line with expected discharge volumes and were slightly increased in response to the rainfall event. At this stage there is no additional mitigation measures planned to be implemented to minimise overtopping beyond the continued maximisation of operation of the leachate treatment plant and ongoing monthly sampling.

Landfill gas monitoring conducted during the reporting period indicated that there was no methane gas detected in on or offsite monitoring locations and the calculated risk level of offsite methane and carbon dioxide gas levels were lower, or consistent with historic levels.

Odour monitoring was undertaken during the monitoring period with no to very low levels of odour detected onsite. Odour was not detected at levels greater than 2OU onsite or at the project downwind boundary and are therefore considered compliant with the trigger levels presented in the LLGOMP.

5.0 Appendix A

Leachate Overtopping Report to EPA

SYDNEY GATEWAY

A Joint Venture Project

JOHN HOLLAND SEYMOUR WHYTE

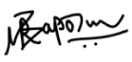
Environmental Information Report

Sydney Gateway Leachate Overtopping Bentonite Wall at Surface 24-03-22

Project: Sydney Gateway Road Project

Document No: SGWPW-JHSW-S1S-EW-RPT-061005

DOCUMENT APPROVAL

REVISION	DATE	PREPARED	REVIEWED	APPROVED	REMARKS
0	06/04/22	Maulik Bapodara	Rob Muir	Rob Muir	For Submission to EPA
Signature:					

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1.0 Introduction

1.1 Description

On 24 March 2022 at 11:26am John Holland Seymour Whyte (JHSW) contacted the EPA's Kiah Ostowari to advise that leachate was currently overtopping the bentonite wall at the former Tempe landfill within EPL 21524 premised area and entering the Alexandra Canal as a result of recent heavy rainfall. On 25 March 2022 a subsequent email (Appendix A) was sent to EPA environment line (EPA Ref No 11253) detailing the following:

- A discharge from the JHSW premise area relating to, what is believed to be, the overtopping of the bentonite wall.
- JHSW believe that this is related to the recent significant rain events and that this situation has only recently become visible as the water levels have subsided.
- It is noted that JHSW has continued to operate and maintain the LTP in accordance with the TWA and EPL condition O5.27 including maximising the volume of leachate treated. In addition, JHSW has well established perimeter controls in place to manage both clean water diversions around the site and management of leachate water within the Tempe site, these continue to be effective and operational.
- It is noted that following the recent significant rain events that the entire catchment area is saturated so the 'low point' which sits around the ATL surface has continued to have ponded water.
- JHSW considers that this water is leachate overtopping the bentonite wall.
- JHSW does not consider that this situation differs from large rain events that would have occurred prior to construction and notes that Condition O5.27 acknowledges that overtopping of the bentonite wall remains a historic and ongoing issue.

This report provides an overview of the overtopping event including the following:

- Location plan of the overtopping at the surface
- Evidence to support that the leachate treatment plant has been operating during the overtopping
- Maintenance schedule for the leachate collection system
- Water quality monitoring results from ponded water and water quality within the canal.

1.2 Background Information

There is a recognised pre-existing condition at the former Tempe landfill where leachate overtops the bentonite wall during rain events, the bentonite wall and associated leachate collection system was installed in 2003 in response to Voluntary Remediation Agreement 26050 with the intent of minimising the impacts of leachate on the Alexandra Canal water quality.

This report is provided as information only as JHSW does not consider that the overtopping event identified on 24 March 2022 constitutes an incident.

2.0 Timeline of events

A Timeline of events and initial actions taken by JHSW are detailed in Table 1 below.

Table 1 Timeline and actions taken by the licensee in relation to the event

Date	Action	Relevant Personnel
23/02/2022	Heavy rainfall commenced on site with 137.2mm of rain being received on 23/02/22, with a further 151.6mm being received for the remainder of February 2022. Total rainfall received between 01/02/22 and 31/03/22 was 817.8mm as recorded at Sydney Airport weather station. Australian Bureau of Meteorology issued a flood warning for the Cooks River at Tempe at 4:16pm on 2/3/2022. An inspection undertaken by JHSW environment team on 3/3/2022 observed localised flooding within the project area adjacent to Alexandra Canal, refer to Figure 1 for photo taken during the inspection in the area where the over topping event has been observed.	JHSWJV Environment Manager
23/02/2022 to 23/3/2022	Ponded water has been observed to persistent in the low laying area within the premise next to the Alexandra Canal from late February to present, refer to Figure 5 for location of ponded water. On the afternoon of the 23/3/2022 it was observed that the ponded water level had receded to a level where the source of the water could be identified. The area is saturated with water, but clear water suspected to contain leachate was observed to be upwelling from disused groundwater monitoring wells, leachate pit two and from the ground under the desal pipeline, refer to figures 1, 2, 3 & 4 for photos. A water sample from the canal was taken.	Environment Manager Site Superintendent Environment, Approvals and Sustainability Manager
24/03/2022	On the morning of the 24/3/2022 a field test for ammonia was undertaken by JHSW environment team and determined the presents of ammonia within the ponded water, the water coming from the disused groundwater monitoring well, leachate pit 2 and surface flow under the desal pipeline. Event reported to EPA Pollution Line. Water samples were taken from the disused monitoring well, leachate pit 2, surface flow. Samples were submitted to NATA accredited lab, refer to Appendix B for monitoring results.	Environment Advisor

Figure 1 Localised flooding along Alexandra Canal 3/3/22

Figure 2 Disused groundwater monitoring well 23/3/22

Figure 3 Ponded surface water 23/3/22

Figure 4 Leachate pit 2 23/3/22

2.0 Location Plan showing overtopping of leachate at surface

Water samples were taken at three source locations and one location within the receival environment adjacent to the site within Alexandra Canal. Refer to Table 2 for summary of sampling results (full results refer to Appendix B). Refer to Figure 5 for the locality plan and sampling locations:

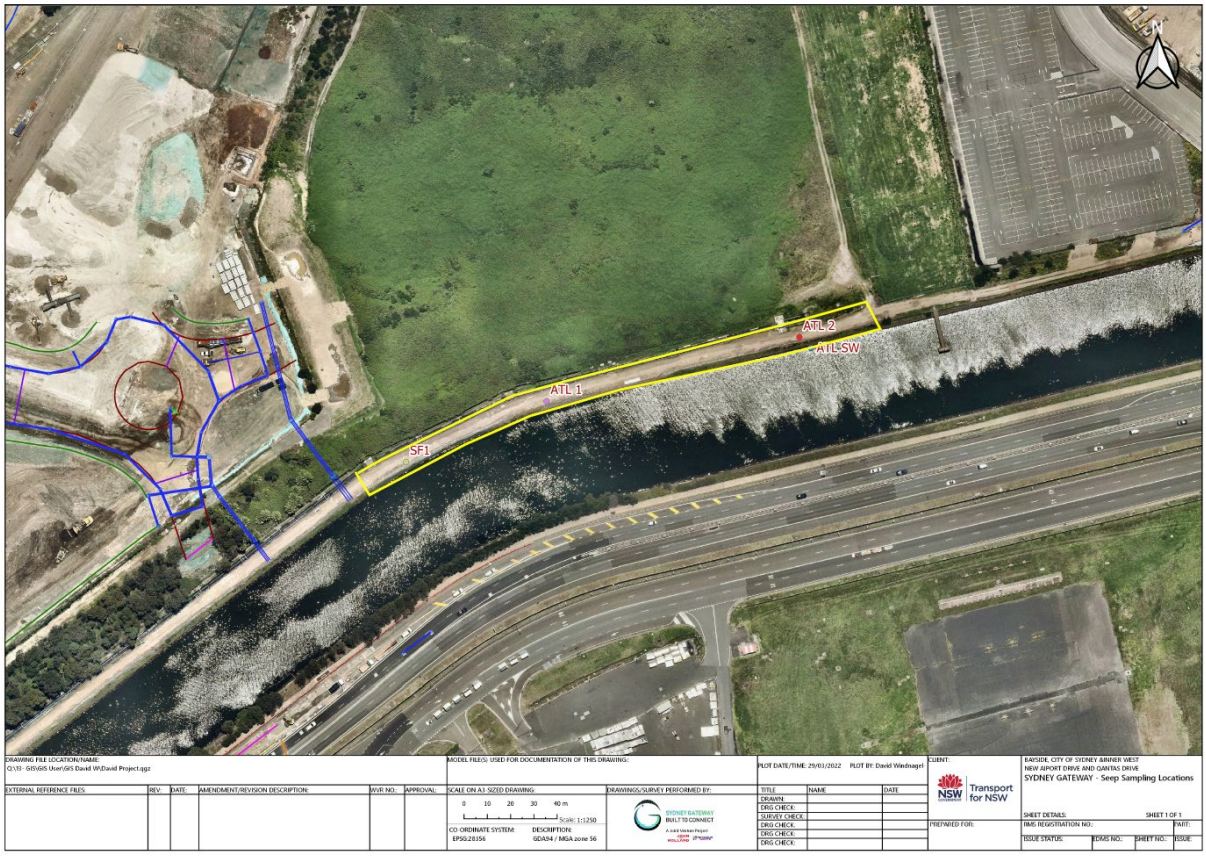
Location Descriptions:

- ATL1 - water from the monitoring well upwelling
- ATL2 -water from leachate pit two
- SF1 – surface water from under desal pipeline
- ATLSW - Alexandra Canal adjacent to overtopping.

Table 2 Sampling results at the event site

Analyte	Results at four locations			
	ATL1	ATL2	SF1	ATLSW
Ammonia (as N)	59	61	60	4.6
Nitrate (as N)	<0.02	<0.02	<0.02	2
Nitrite (as N)	0.09	0.50	0.03	0.03
Phosphate total (as P)	0.06	0.05	0.09	0.08

Figure 5 Locality Plan and Sampling Locations



3.0 Summary of LTP operation before and during the event

Leachate treatment plant has been operating as per design and intended operational capacity before, during and after the overtopping event. Raw water feed volumes and treatment volumes have been consistent with the treatment objectives and leachate extraction rates. Trade wastewater discharge flow rates have also been consistent as per the trade waste agreement with a slight increase in discharge volume in response to the rain event with an average of 107kL of treaded leachate being discharged daily.

Refer to the table 3 below for daily discharge volumes between 1 February 2022 and 23 March 2022 including daily maintenance notes.

Table 3 Leachate Treatment Plant Discharge Volumes and Maintenance Notes.

Date	Total Trade Waste Discharge Flow Volume M3	Notes
01/02/2022	110	Monthly servicing completed on 28/01/22 Blower service and maintenance completed 28/01/22 TW Discharge Criteria met No ammonia detected in field test Plant continued normal operations No issues to report
02/02/2022	94	pH sensor cable issue, plant offline for a short period of time on 02/02/22 while the cable was swapped out TW Discharge Criteria met No ammonia detected in field test
03/02/2022	91	TW Discharge Criteria met No ammonia detected in field test Plant continued normal operations No issues to report Volumes consistent with the treatment objectives Volumes are based off maximum extraction rates from leachate collection system No scheduled maintenance shutdowns
04/02/2022	90	TW Discharge Criteria met No ammonia detected in field test Plant continued normal operations No issues to report Volumes consistent with the treatment objectives Volumes are based off maximum extraction rates from leachate collection system No scheduled maintenance shutdowns
05/02/2022	106	TW Discharge Criteria met No ammonia detected in field test Plant continued normal operations No issues to report Volumes consistent with the treatment objectives Volumes are based off maximum extraction rates from leachate collection system No scheduled maintenance shutdowns
06/02/2022	95	TW Discharge Criteria met No ammonia detected in field test Plant continued normal operations No issues to report Volumes consistent with the treatment objectives Volumes are based off maximum extraction rates from leachate collection system No scheduled maintenance shutdowns

07/02/2022	91	TW Discharge Criteria met No ammonia detected in field test Plant continued normal operations No issues to report Volumes consistent with the treatment objectives Volumes are based off maximum extraction rates from leachate collection system No scheduled maintenance shutdowns
08/02/2022	109	TW Discharge Criteria met No ammonia detected in field test Plant continued normal operations No issues to report Volumes consistent with the treatment objectives Volumes are based off maximum extraction rates from leachate collection system No scheduled maintenance shutdowns
09/02/2022	75	TW Discharge Criteria met No ammonia detected in field test Plant continued normal operations No issues to report Volumes consistent with the treatment objectives Volumes are based off maximum extraction rates from leachate collection system No scheduled maintenance shutdowns
10/02/2022	111	Treatment volumes consistent with treatment objectives and leachate extraction rates LTP continued normal operations TW Discharge Criteria met No ammonia detected in field test
11/02/2022	98	Treatment volumes consistent with treatment objectives and leachate extraction rates LTP continued normal operations TW Discharge Criteria met No ammonia detected in field test
12/02/2022	94	Treatment volumes consistent with treatment objectives and leachate extraction rates LTP continued normal operations TW Discharge Criteria met No ammonia detected in field test
13/02/2022	109	Treatment volumes consistent with treatment objectives and leachate extraction rates LTP continued normal operations TW Discharge Criteria met No ammonia detected in field test
14/02/2022	94	Treatment volumes consistent with treatment objectives and leachate extraction rates LTP continued normal operations TW Discharge Criteria met No ammonia detected in field test
15/02/2022	91	Treatment volumes consistent with treatment objectives and leachate extraction rates LTP continued normal operations TW Discharge Criteria met No ammonia detected in field test

16/02/2022	113	Treatment volumes consistent with treatment objectives and leachate extraction rates LTP continued normal operations TW Discharge Criteria met No ammonia detected in field test
17/02/2022	90	LTP continued normal operation TW Discharge Criteria met No ammonia detected in field test
18/02/2022	91	LTP continued normal operation TW Discharge Criteria met No ammonia detected in field test
19/02/2022	109	LTP continued normal operation TW Discharge Criteria met No ammonia detected in field test
20/02/2022	89	LTP continued normal operation TW Discharge Criteria met No ammonia detected in field test
21/02/2022	98	LTP continued normal operation TW Discharge Criteria met No ammonia detected in field test
22/02/2022	168	LTP continued normal operation TW Discharge Criteria met No ammonia detected in field test SBR feed volumes were slightly reduced due to a generator issue
23/02/2022	129	Finished leachate collection system cable relocation cut over works for section 1 Excessive rain has exposed drainage issues surrounding the LTP Generator issue on 22/03/22 where it was switched off overnight due to an alarm. Generator has been fixed and operating as per normal. TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly reduced due to a generator issue
24/02/2022	99	TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly increased due to increased volume extraction
25/02/2022	112	TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly increased due to increased volume extraction
26/02/2022	135	TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly increased due to increased volume extraction
27/02/2022	92	TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly increased due to increased volume extraction

28/02/2022	102	TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly increased due to increased volume extraction
01/03/2022	102	TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly increased due to increased volume extraction
02/03/2022	114	TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly increased due to increased volume extraction
03/03/2022	125	TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly increased due to increased volume extraction No issues or faults to report
04/03/2022	103	TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly increased due to increased volume extraction No issues or faults to report
05/03/2022	97	TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly increased due to increased volume extraction No issues or faults to report
06/03/2022	129	TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly increased due to increased volume extraction No issues or faults to report
07/03/2022	138	TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly increased due to increased volume extraction No issues or faults to report
08/03/2022	130	TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly increased due to increased volume extraction No issues or faults to report
09/03/2022	113	TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly increased due to increased volume extraction No issues or faults to report

10/03/2022	95	Treatment volumes consistent with treatment objectives and leachate extraction rates TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly increased due to increased volume extraction No issues or faults to report
11/03/2022	105	Treatment volumes consistent with treatment objectives and leachate extraction rates TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly increased due to increased volume extraction No issues or faults to report
12/03/2022	108	Treatment volumes consistent with treatment objectives and leachate extraction rates TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly increased due to increased volume extraction No issues or faults to report
13/03/2022	98	Treatment volumes consistent with treatment objectives and leachate extraction rates TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly increased due to increased volume extraction No issues or faults to report
14/03/2022	113	Treatment volumes consistent with treatment objectives and leachate extraction rates TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly increased due to increased volume extraction No issues or faults to report
15/03/2022	107	Treatment volumes consistent with treatment objectives and leachate extraction rates TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly increased due to increased volume extraction No issues or faults to report
16/03/2022	113	Treatment volumes consistent with treatment objectives and leachate extraction rates TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly increased due to increased volume extraction No issues or faults to report
17/03/2022	121	Treatment volumes consistent with treatment objectives and leachate extraction rates TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly increased due to increased volume extraction No issues or faults to report

18/03/2022	104	Treatment volumes consistent with treatment objectives and leachate extraction rates TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly increased due to increased volume extraction No issues or faults to report
19/03/2022	109	Treatment volumes consistent with treatment objectives and leachate extraction rates TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly increased due to increased volume extraction No issues or faults to report
20/03/2022	122	Treatment volumes consistent with treatment objectives and leachate extraction rates TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly increased due to increased volume extraction No issues or faults to report
21/03/2022	99	Treatment volumes consistent with treatment objectives and leachate extraction rates TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly increased due to increased volume extraction No issues or faults to report
22/03/2022	115	Treatment volumes consistent with treatment objectives and leachate extraction rates TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly increased due to increased volume extraction No issues or faults to report
23/03/2022	117	Treatment volumes consistent with treatment objectives and leachate extraction rates TW Discharge Criteria met No ammonia detected in field test Increased discharge due to rainfall SBR feed volumes were slightly increased due to increased volume extraction No issues or faults to report

4.0 Summary

On 24 March 2022 John Holland Seymour Whyte contacted the EPA's to advise that leachate was overtopping the bentonite wall at the former Tempe landfill within EPL 21524. The overtopping of the bentonite wall was caused by heavy rainfall received at the former Tempe Landfill between 23 February 2022 and 23 March 2022 and flooding of the Alexandra Canal on 2 & 3 March 2022.

Water samples taken from upwellings from a disused groundwater monitoring well, leachate pit two and surface flows recorded elevated ammonia levels confirming that the overtopping was leachate.

A review of the operation and maintenance of the leachate collection system identified that it was being operated to maximise the treatment and disposal of leachate with no major plant or equipment failures in accordance with EPL 21524 condition O5.27. Leachate treatment and discharge occurred consistently in line with expected discharge volumes and were slightly increased in response to the rainfall event.

As there is a recognised pre-existing condition at the former Tempe landfill where leachate overtops the bentonite wall during rain events JHSW does not consider that the overtopping event identified on 24 March 2022 constitutes an incident.

Appendix A – EPA Correspondence

From: Robert Muir-JHG
To: info@epa.nsw.gov.au
Cc: Kiah Ostowari; Olivia Patterson; Aleksandra Young; Maulik Bapodara-JHG; David Pavlovic-JHG
Subject: Sydney Gateway EPL 21524 - Notification of bentonite wall overtopping
Date: Friday, 25 March 2022 10:31:00 AM
Attachments: image003.png
image004.png

Hi Kiah,

Further to our phone conversation yesterday, I am writing to advise of a discharge from the JHSW premise area relating to, what we believe to be, the overtopping of the bentonite wall. We believe this is related to the recent significant rain events and that this situation has only recently become visible as the water levels have subsided.

We note that JHSW has continued to operate and maintain the LTP in accordance with the TWA and EPL condition O5.27 including maximising the volume of leachate treated. In addition, JHSW has well established perimeter controls in place to manage both clean water diversions around the site and management of leachate water within the Tempe site, these continue to be effective and operational.

We note that following the recent significant rain events that the entire catchment area is saturated so the 'low point' which sits around the ATL surface has continued to have ponded water. JHSW considers that this water is leachate overtopping the bentonite wall.

JHSW does not consider that this situation differs from large rain events that would have occurred prior to construction and notes that Condition O5.27 acknowledges that overtopping of the bentonite wall remains a historic and ongoing issue.

As discussed with you yesterday, JHSW will provide an environmental event report to the EPA by 1 April 2022 documenting the overtopping event that will consist of:

- Location plan of the overtopping at the surface
- Evidence to support that the leachate treatment plant has been operating during the overtopping
- Maintenance schedule for the leachate collection system
- Water quality monitoring results from ponded water and water quality within the canal.

Regards,

Robert Muir
Environment, Approvals and Sustainability Manager
Sydney Gateway Project
SYDNEY GATEWAY
INTEGRITY | COMMITMENT | TOGETHER
JOHN HOLLAND SEYMOUR WHYTE
A. Building D 10 Bourke Road, Mascot NSW 2020
E. robert.muir@jhsw.com.au
M. 0439 691 679

Appendix B – Lab Certificates

John Holland Pty Ltd & Seymour Whyte Constructions
Level 3 65 Pirrama
Pyrmont
NSW 2009

Attention: **Rob Muir**

Report **874704-W**
Project name SYDNEY GATEWAY STAGE 1 & 3
Project ID 7030
Received Date Mar 24, 2022

Client Sample ID			**ATL_1**	**ATL_2**	**SF1**
Sample Matrix			**Water**	**Water**	**Water**
Eurofins Sample No.			**S22-Ma55739**	**S22-Ma55740**	**S22-Ma55741**
Date Sampled			**Mar 24, 2022**	**Mar 24, 2022**	**Mar 24, 2022**
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons					
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	0.07	< 0.05
TRH C15-C28	0.1	mg/L	0.4	0.3	0.3
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	0.4	0.37	0.3
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	0.11	0.12	0.07
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	0.11	0.12	0.07
TRH >C16-C34	0.1	mg/L	0.4	0.2	0.3
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	0.51	0.32	0.37
BTEX					
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	75	72	72
Dissolved Gases					
Methane	0.05	mg/L	< 0.05	< 0.05	0.09
Polycyclic Aromatic Hydrocarbons					
Acenaphthene	0.001	mg/L	< 0.02	< 0.02	< 0.02
Acenaphthylene	0.001	mg/L	< 0.02	< 0.02	< 0.02
Anthracene	0.001	mg/L	< 0.02	< 0.02	< 0.02
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001	< 0.001	< 0.001
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001

Client Sample ID			ATL_1	ATL_2	SF1
Sample Matrix			Water	Water	Water
Eurofins Sample No.			S22-Ma55739	S22-Ma55740	S22-Ma55741
Date Sampled			Mar 24, 2022	Mar 24, 2022	Mar 24, 2022
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
Fluorene	0.001	mg/L	< 0.02	< 0.02	< 0.02
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.02	< 0.02	< 0.02
Phenanthrene	0.001	mg/L	< 0.02	< 0.02	< 0.02
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.02	< 0.02	< 0.02
2-Fluorobiphenyl (surr.)	1	%	INT	INT	INT
p-Terphenyl-d14 (surr.)	1	%	63	81	63
Ammonia (as N)	0.01	mg/L	59	61	60
Nitrate (as N)	0.02	mg/L	< 0.02	< 0.02	< 0.02
Nitrite (as N)	0.02	mg/L	0.09	0.50	0.03
Phosphate total (as P)	0.01	mg/L	0.06	0.05	0.09
Per- and Polyfluoroalkyl Substances (PFASs) - Short					
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
13C2-6:2 FTSA (surr.)	1	%	149	167	176
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]0.07	[N09]0.05	[N09]0.04
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.10	[N09]0.07	[N09]0.06
18O2-PFHxS (surr.)	1	%	110	111	110
13C8-PFOS (surr.)	1	%	90	88	97
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	[N09]0.25	[N09]0.22	[N09]0.17
13C8-PFOA (surr.)	1	%	52	44	46
Sum (PFHxS + PFOS)*	0.01	ug/L	0.17	0.12	0.1
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.35	0.29	0.23
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.42	0.34	0.27

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins Suite B4			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Mar 28, 2022	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Mar 26, 2022	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Mar 28, 2022	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Mar 26, 2022	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
Polycyclic Aromatic Hydrocarbons	Sydney	Mar 28, 2022	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Dissolved Gases	Melbourne	Mar 30, 2022	14 Days
- Method: in-house method LTM-ORG-2070 by Headspace GC-FID			
Ammonia (as N)	Melbourne	Mar 30, 2022	28 Days
- Method: APHA 4500-NH3 Ammonia Nitrogen by FIA			
Nitrate (as N)	Melbourne	Apr 01, 2022	28 Days
- Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA			
Nitrite (as N)	Melbourne	Apr 01, 2022	2 Days
- Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA			
Phosphate total (as P)	Sydney	Mar 28, 2022	28 Days
- Method: E052 Total Phosphate (as P)			
Per- and Polyfluoroalkyl Substances (PFASs) - Short	Brisbane	Mar 30, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

eurofins | Environment Testing

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Company Name: John Holland Pty Ltd & Seymour Whyte Constructions
Address: Level 3 65 Pirrama
Pyrmont
NSW 2009

Project Name: SYDNEY GATEWAY STAGE 1 & 3
Project ID: 7030

Order No.:
Report #: 874704
Phone: 0404 675 049
Fax:

Received: Mar 24, 2022 5:19 PM
Due: Mar 25, 2022
Priority: 1 Day
Contact Name: Rob Muir

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Ammonia (as N)	Methane	Nitrate & Nitrite (as N)	Phosphate total (as P)	Eurofins Suite B4	Per- and Polyfluoroalkyl Substances (PFASs) - Short
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X			
Sydney Laboratory - NATA # 1261 Site # 18217									X	X	
Brisbane Laboratory - NATA # 1261 Site # 20794											X
Mayfield Laboratory - NATA # 1261 Site # 25079											
Perth Laboratory - NATA # 2377 Site # 2370											
External Laboratory											
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
1	ATL_1	Mar 24, 2022		Water	S22-Ma55739	X	X	X	X	X	X
2	ATL_2	Mar 24, 2022		Water	S22-Ma55740	X	X	X	X	X	X
3	SF1	Mar 24, 2022		Water	S22-Ma55741	X	X	X	X	X	X
Test Counts						3	3	3	3	3	3

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Ammonia (as N)	mg/L	< 0.01			0.01	Pass	
Nitrate (as N)	mg/L	< 0.02			0.02	Pass	
Nitrite (as N)	mg/L	< 0.02			0.02	Pass	
Phosphate total (as P)	mg/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	93			70-130	Pass	
TRH C10-C14	%	77			70-130	Pass	
Naphthalene	%	95			70-130	Pass	
TRH C6-C10	%	94			70-130	Pass	
TRH >C10-C16	%	76			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	102			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Toluene	%	102			70-130	Pass	
Ethylbenzene	%	103			70-130	Pass	
m&p-Xylenes	%	104			70-130	Pass	
o-Xylene	%	105			70-130	Pass	
Xylenes - Total*	%	105			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	90			70-130	Pass	
Acenaphthylene	%	95			70-130	Pass	
Anthracene	%	116			70-130	Pass	
Benz(a)anthracene	%	103			70-130	Pass	
Benzo(a)pyrene	%	113			70-130	Pass	
Benzo(b&j)fluoranthene	%	101			70-130	Pass	
Benzo(g.h.i)perylene	%	108			70-130	Pass	
Benzo(k)fluoranthene	%	99			70-130	Pass	
Chrysene	%	113			70-130	Pass	
Dibenz(a.h)anthracene	%	88			70-130	Pass	
Fluoranthene	%	97			70-130	Pass	
Fluorene	%	116			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	86			70-130	Pass	
Naphthalene	%	72			70-130	Pass	
Phenanthrene	%	104			70-130	Pass	
Pyrene	%	116			70-130	Pass	
LCS - % Recovery							
Nitrite (as N)	%	106			70-130	Pass	
Phosphate total (as P)	%	95			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Per- and Polyfluoroalkyl Substances (PFASs) - Short				Result 1					
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	S22-Ma55739	CP	%	101			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S22-Ma55739	CP	%	59			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	S22-Ma55739	CP	%	76			50-150	Pass	
Perfluorooctanoic acid (PFOA)	S22-Ma55739	CP	%	103			50-150	Pass	
Spike - % Recovery									
				Result 1					
Phosphate total (as P)	S22-Ma55740	CP	%	96			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	S22-Ma50863	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Naphthalene	S22-Ma50863	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	S22-Ma50863	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S22-Ma50863	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S22-Ma50863	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S22-Ma50863	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S22-Ma50863	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S22-Ma50863	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	S22-Ma50863	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	

Duplicate									
				Result 1	Result 2	RPD			
Phosphate total (as P)	S22-Ma55739	CP	mg/L	0.06	0.04	47	30%	Fail	Q15

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Ursula Long	Analytical Services Manager
Vivian Wang	Senior Analyst (VIC)
Mary Makarios	Senior Analyst (NSW)
Jonathon Angell	Senior Analyst (NSW)

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

John Holland Pty Ltd & Seymour Whyte Constructions
Level 3 65 Pirrama
Pyrmont
NSW 2009

Attention: **Rob Muir**

Report **873719-W**
Project name SYDNEY GATEWAY STAE 1 & 3
Project ID 7030
Received Date Mar 23, 2022

Client Sample ID			**ATL SW**
Sample Matrix			**Water**
Eurofins Sample No.			**S22-Ma48074**
Date Sampled			**Mar 23, 2022**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons			
TRH C6-C9	0.02	mg/L	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1
Naphthalene[N02]	0.01	mg/L	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003
4-Bromofluorobenzene (surr.)	1	%	82
Polycyclic Aromatic Hydrocarbons			
Acenaphthene	0.001	mg/L	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001
Anthracene	0.001	mg/L	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001
Chrysene	0.001	mg/L	< 0.001
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001
Fluoranthene	0.001	mg/L	< 0.001
Fluorene	0.001	mg/L	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001

Client Sample ID			ATL SW
Sample Matrix			**Water**
Eurofins Sample No.			**S22-Ma48074**
Date Sampled			**Mar 23, 2022**
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Naphthalene	0.001	mg/L	< 0.001
Phenanthrene	0.001	mg/L	< 0.001
Pyrene	0.001	mg/L	< 0.001
Total PAH*	0.001	mg/L	< 0.001
2-Fluorobiphenyl (surr.)	1	%	61
p-Terphenyl-d14 (surr.)	1	%	80
Ammonia (as N)	0.01	mg/L	4.6
Nitrate & Nitrite (as N)	0.05	mg/L	1.1
Phosphate total (as P)	0.01	mg/L	0.10
Per- and Polyfluoroalkyl Substances (PFASs) - Short			
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	0.05	ug/L	< 0.05
13C2-6:2 FTSA (surr.)	1	%	52
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.04
18O2-PFHxS (surr.)	1	%	114
13C8-PFOS (surr.)	1	%	77
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	[N09]0.02
13C8-PFOA (surr.)	1	%	107
Sum (PFHxS + PFOS)*	0.01	ug/L	0.05
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.06
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.07

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins Suite B4			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Mar 24, 2022	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Mar 24, 2022	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Mar 24, 2022	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	Mar 24, 2022	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
Polycyclic Aromatic Hydrocarbons	Melbourne	Mar 24, 2022	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Ammonia (as N)	Melbourne	Mar 24, 2022	28 Days
- Method: APHA 4500-NH3 Ammonia Nitrogen by FIA			
Nitrate & Nitrite (as N)	Melbourne	Mar 24, 2022	28 Days
- Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA			
Phosphate total (as P)	Melbourne	Mar 25, 2022	28 Days
- Method: LTM-INO-4040 Phosphate by CFA			
Per- and Polyfluoroalkyl Substances (PFASs) - Short	Brisbane	Mar 24, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

eurofins | Environment Testing

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne
6 Monterey Road
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Phone : +61 3 8564 5000
NATA # 1261 Site # 1254

Sydney
Unit F3, Building F
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Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Newcastle
4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Phone : +61 2 4968 8448
NATA # 1261 Site # 25079

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

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46-48 Banksia Road
Welshpool WA 6106
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NATA # 2377 Site # 2370

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Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: John Holland Pty Ltd & Seymour Whyte Constructions
Address: Level 3 65 Pirrama
Pyrmont
NSW 2009

Project Name: SYDNEY GATEWAY STAE 1 & 3
Project ID: 7030

Order No.: 42
Report #: 873719
Phone: 0404 675 049
Fax:

Received: Mar 23, 2022 4:12 PM
Due: Mar 24, 2022
Priority: 1 Day
Contact Name: Rob Muir

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Ammonia (as N)	Nitrate & Nitrite (as N)	Phosphate total (as P)	Eurofins Suite B4	Per- and Polyfluoroalkyl Substances (PFASs) - Short
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	
Sydney Laboratory - NATA # 1261 Site # 18217										
Brisbane Laboratory - NATA # 1261 Site # 20794										X
Mayfield Laboratory - NATA # 1261 Site # 25079										
Perth Laboratory - NATA # 2377 Site # 2370										
External Laboratory										
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**					
1	ATL SW	Mar 23, 2022		Water	S22-Ma48074	X	X	X	X	X
Test Counts						1	1	1	1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Per- and Polyfluoroalkyl Substances (PFASs) - Short							
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Per- and Polyfluoroalkyl Substances (PFASs) - Short							
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	%	103			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	99			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	101			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	98			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Per- and Polyfluoroalkyl Substances (PFASs) - Short				Result 1					
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	S22-Ma43443	NCP	%	106			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S22-Ma43443	NCP	%	103			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	S22-Ma43443	NCP	%	111			50-150	Pass	
Perfluorooctanoic acid (PFOA)	S22-Ma43443	NCP	%	97			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Per- and Polyfluoroalkyl Substances (PFASs) - Short				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	S22-Ma27679	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S22-Ma43441	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	S22-Ma43441	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	S22-Ma43441	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Eurofins | Environment Testing accreditation number 1261, site 18217 is currently in progress of a controlled transition to a new custom built location at 179 Magowar Road, Girraween, NSW 2145. All results on this report denoted as being performed by Eurofins | Environment Testing Unit F3, Building F, 16 Mars road, Lane Cove West, NSW 2066, corporate site 18217, will have been performed on either Lane Cove or new Girraween site

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.

Authorised by:

Hannah Mawbey	Analytical Services Manager
Joseph Edouard	Senior Analyst-Organic (VIC)
Sarah McCallion	Senior Analyst-PFAS (QLD)
Scott Beddoes	Senior Analyst-Inorganic (VIC)
Vivian Wang	Senior Analyst-Volatile (VIC)

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Appendix C – Leachate Treatment Plan Discharge Records

Gateway Weekly Metrics Report

Charlie Watson
Created Fri, 04 Mar 2022, 1:05 PM (UTC+11)

Automated Form Number	SciDev Water Services-HI0076 Gateway LTP-Site Team-HI0076-FOR-MR-28	
Date	Start: Thu, 24 Feb 2022, 12:00 am	End: Wed, 30 Mar 2022, 12:00 am

SBR Cycle Settings

Treatment Volume (m3)	Cycle Time (mins)	Blend Active / Inactive	Blend Volume (%)
95	330	n/a	n/a

Raw Leachate Riser Flow - FIT01

Date	Volume Total m3	Raw Leachate Feed Flow Rate (l/s)	Notes
Thu, 24 Feb 2022	99	2 l/s	
Fri, 25 Feb 2022	112		
Sat, 26 Feb 2022	135		
Sun, 27 Feb 2022	92		
Mon, 28 Feb 2022	102		
Tue, 01 Mar 2022	114		
Wed, 02 Mar 2022	121		

SBR Feed Flow - FIT02

Date	Volume Total m3	Notes
Thu, 24 Feb 2022	88	
Fri, 25 Feb 2022	109	
Sat, 26 Feb 2022	86	
Sun, 27 Feb 2022	88	
Mon, 28 Feb 2022	109	
Tue, 01 Mar 2022	87	
Wed, 02 Mar 2022	103	

Blend Line Flow - FIT02

Date	Volume Total m3	Notes

Trade Waste Discharge Flow - FIT05

Date	Volume Total m3	Notes
Thu, 24 Feb 2022	99	
Fri, 25 Feb 2022	112	
Sat, 26 Feb 2022	135	
Sun, 27 Feb 2022	92	
Mon, 28 Feb 2022	102	
Tue, 01 Mar 2022	102	

Date	Volume Total m3	Notes
Wed, 02 Mar 2022	114	

Treatment Volume Notes

- treatment volumes are consistent with treatment objectives and leachate extraction rates
- Volume slightly increased due to rain fall
- SBR feed volumes were slightly increased do to increased volume extraction

Ammonia Field Test

Date	Result	Notes
Tue, 01 Mar 2022	00ppm	n/a

Trade Waste Sampling

Sampling Undertaken	Date of Sampling	Time Start	Time Finished	Volume Treated (m3)
No				

TW Discharge Criteria Met	Results Attached

Weekly Overview

- plant continued normal operation
- no issues or faults to report

Signature

Charlie Watson, Fri, 04 Mar 2022, 1:32 pm

Gateway Weekly Metrics Report

Charlie Watson
Created Thu, 10 Mar 2022, 3:01 PM (UTC+11)

Automated Form Number	SciDev Water Services-HI0076 Gateway LTP-Site Team-HI0076-FOR-MR-29	
Date	Start: Thu, 03 Mar 2022, 12:00 am	End: Wed, 09 Mar 2022, 12:00 am

SBR Cycle Settings

Treatment Volume (m3)	Cycle Time (mins)	Blend Active / Inactive	Blend Volume (%)
95	330	n/a	n/a

Raw Leachate Riser Flow - FIT01

Date	Volume Total m3	Raw Leachate Feed Flow Rate (l/s)	Notes
Thu, 03 Mar 2022	100	2 l/s	
Fri, 04 Mar 2022	72		
Sat, 05 Mar 2022	52		
Sun, 06 Mar 2022	117		
Mon, 07 Mar 2022	125		
Tue, 08 Mar 2022	113		
Wed, 09 Mar 2022	102		

SBR Feed Flow - FIT02

Date	Volume Total m3	Notes
Thu, 03 Mar 2022	113	
Fri, 04 Mar 2022	92	
Sat, 05 Mar 2022	108	
Sun, 06 Feb 2022	94	
Mon, 07 Feb 2022	87	
Tue, 08 Mar 2022	104	
Wed, 09 Mar 2022	89	

Blend Line Flow - FIT02

Date	Volume Total m3	Notes

Trade Waste Discharge Flow - FIT05

Date	Volume Total m3	Notes
Thu, 03 Mar 2022	125	
Fri, 04 Mar 2022	103	
Sat, 05 Mar 2022	97	
Sun, 06 Mar 2022	129	
Mon, 07 Mar 2022	138	
Wed, 09 Mar 2022	130	

Date	Volume Total m3	Notes
Thu, 10 Mar 2022	113	

Treatment Volume Notes

- treatment volumes are consistent with treatment objectives and leachate extraction rates
- Volume slightly increased due to rain fall
- SBR feed volumes were slightly increased do to increased volume extraction

Ammonia Field Test

Date	Result	Notes
Wed, 09 Mar 2022	00ppm	n/a

Trade Waste Sampling

Sampling Undertaken	Date of Sampling	Time Start	Time Finished	Volume Treated (m3)
Yes	Mon, 07 Mar 2022	8:00 am	8:00 am	144

TW Discharge Criteria Met	Results Attached
N/A	N/A

Weekly Overview

- plant continued normal operation
- no issues or faults to report
- Trade waste sampling event occurred on Monday 7th with Sydney water and Transport NSW. Composites sampled by sydney water for analysis.

Signature

Charlie Watson, Thu, 10 Mar 2022, 3:31 pm

Gateway Weekly Metrics Report

Charlie Watson
Created Mon, 21 Mar 2022, 10:06 AM (UTC+11)

Automated Form Number	SciDev Water Services-HI0076 Gateway LTP-Site Team-HI0076-FOR-MR-30	
Date	Start: Thu, 10 Mar 2022, 12:00 am	End: Wed, 16 Mar 2022, 12:00 am

SBR Cycle Settings

Treatment Volume (m3)	Cycle Time (mins)	Blend Active / Inactive	Blend Volume (%)
95	330	n/a	n/a

Raw Leachate Riser Flow - FIT01

Date	Volume Total m3	Raw Leachate Feed Flow Rate (l/s)	Notes
Thu, 10 Mar 2022	100	2 l/s	
Fri, 11 Mar 2022	101		
Sat, 12 Mar 2022	102		
Sun, 13 Mar 2022	103		
Mon, 14 Mar 2022	102		
Tue, 15 Mar 2022	106		
Wed, 16 Mar 2022	106		

SBR Feed Flow - FIT02

Date	Volume Total m3	Notes
Thu, 10 Mar 2022	93	
Fri, 11 Mar 2022	118	
Sat, 12 Mar 2022	93	
Sun, 13 Feb 2022	94	
Mon, 14 Feb 2022	119	
Tue, 15 Mar 2022	97	
Wed, 16 Mar 2022	97	

Blend Line Flow - FIT02

Date	Volume Total m3	Notes

Trade Waste Discharge Flow - FIT05

Date	Volume Total m3	Notes
Thu, 10 Mar 2022	95	
Fri, 11 Mar 2022	105	
Sat, 12 Mar 2022	108	
Sun, 13 Mar 2022	98	
Mon, 14 Mar 2022	113	
Tue, 15 Mar 2022	107	

Date	Volume Total m3	Notes
Wed, 16 Mar 2022	113	

Treatment Volume Notes

- treatment volumes are consistent with treatment objectives and leachate extraction rates

Ammonia Field Test

Date	Result	Notes
Wed, 16 Mar 2022	00ppm	n/a

Trade Waste Sampling

Sampling Undertaken	Date of Sampling	Time Start	Time Finished	Volume Treated (m3)
Yes	Mon, 07 Mar 2022	8:00 am	8:00 am	144

TW Discharge Criteria Met	Results Attached
Yes	Yes

Weekly Overview

- plant continued normal operation
- no issues or faults to report
- Trade waste sampling results returned
- Temporary treated ground water discharge tank and infrastructure mobilised to site on Thursday. expected to be able to receive water for discharge by Monday.

Signature

Charlie Watson, Mon, 21 Mar 2022, 10:13 am

CERTIFICATE OF ANALYSIS

Work Order	: **ES2208126**	Page	: 1 of 4
Client	: **HALDON INDUSTRIES**	Laboratory	: Environmental Division Sydney
Contact	: LOUIS ANDERSON	Contact	: Wael Saleh
Address	: 10/56 O'Riordan st ALEXANDRIA 2015	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: HI0076 - CW		
Order number	: HI0076 - CW		
C-O-C number	: ----		
Site	: TEMPE PARK, 2-4 SMITH STREET, TEMPE, NSW, 2044		
Sampled by	: CW		
Quote number	: ES2021HALIND0006 (TS-022-21)		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

Issue Date	: 15-Mar-2022 14:29	No. of samples received	: 3
Date Samples Received	: 08-Mar-2022 17:00	No. of samples analysed	: 3

Parameter	*Unit*	*LOR*	VALUE
Start time	hrs	1	**08:00 on 07/03/22**
Finish Time	hrs	1	**10:00 on 08/03/22**
Meter Reading (start)	kL	0.001	**11539**
Meter Reading (finish)	kL	0.001	**11683**
TWDF	%	1	**100**
Volume Discharged	kL	0.001	**144**
Volume Discharged (corrected)	kL	0.001	**144**

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. All pages of this report have been checked and approved for release.

Where a result is required to meet compliance limits, the associated uncertainty **must be** considered. Refer to the ALS Contract Terms and Conditions for details, and EnviroMail 53 for a guide on how to interpret the measurement of uncertainty (MU).

Black shading is applied where the result is equal to or greater than the guideline upper limit or the result is equal to or lower than the guideline lower limit. Any shading applied does not take into account measurement uncertainty.

A copy of this report will not be forwarded to Sydney Water unless otherwise instructed.

Analysis conducted on samples as received.

Mass discharge calculation is not covered by ALS accreditation terms.

Sample and Sampling information supplied by Haldon Industries

pH on site ?? (initial, final or both) was not reported as there was no flow.

SAMPLING CONDITIONS: Grabs per bottle: ?????, Sample Interval: ?????kL or min, mL per grab: ????mL, TWDF: 100%

EK055: Insufficient sample has been provided for QC analysis. Where applicable DUP and MS values have been invalidated

EA016(0.6): Total Dissolved Solids calculated by multiplying Electrical Conductivity by a factor of 0.6.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position (Accreditation Category)
Ankit Joshi	Senior Chemist - Inorganics (Sydney Inorganics, Smithfield, NSW)
Ivan Taylor	Analyst (Sydney Inorganics, Smithfield, NSW)
Wael Saleh	Client Services - Trade Waste Coordinator (Sydney Sampling, Smithfield, NSW)

Analytical Results

				V01-Disc 07-Mar-2022		MASS DISCHARGE	
Method	*TEST PARAMETER*	*Unit*	*LOR*	*Standard Concentration Limit(s)*	**ES2208126001** *MU*	*Maximum Daily Mass Unit(s) (kg)*	*- for sampling event - (kg)*
EK055	**Ammonia as N**	mg/L	0.1	100.00	<0.1 - -	---	---

				V02-Disc 08-Mar-2022		MASS DISCHARGE	
Method	*TEST PARAMETER*	*Unit*	*LOR*	*Standard Concentration Limit(s)*	**ES2208126002** *MU*	*Maximum Daily Mass Unit(s) (kg)*	*- for sampling event - (kg)*
EK055	**Ammonia as N**	mg/L	0.1	100.00	<0.1 - -	---	---

				V03-Comp 08-Mar-2022		MASS DISCHARGE	
Method	*TEST PARAMETER*	*Unit*	*LOR*	*Standard Concentration Limit(s)*	**ES2208126003** *MU*	*Maximum Daily Mass Unit(s) (kg)*	*- for sampling event - (kg)*
EA016 (0.6)	**Total Dissolved Solids (Calc.)**	mg/L	1	10000.00	**1110**	1700	160
EA025H	**Suspended Solids (SS)**	mg/L	5	600.00	**8** ± 1	150	1.22
EG005T	**Barium**	mg/L	0.1	5.00	**0.2**	1	0.0353
EG005T	**Iron**	mg/L	0.05	50.00	**0.17**	9	0.0246
EK055	**Ammonia as N**	mg/L	0.1	100.00	<0.1 - -	35	<0.0144
EP020	**Oil & Grease**	mg/L	5	110.00	<5 - -	2.7	<0.720
EP030	**Biochemical Oxygen Demand**	mg/L	2	---	**2** ± 0.3	90	0.288

Client - Report Received and Actioned

Customer Signature :
Designation :
Date : / /

Water Authority - Report Received and Actioned

TERRITORY

Sample Number :

Wastewater Source Control Office :

Gateway Weekly Metrics Report

Charlie Watson
Created Fri, 25 Mar 2022, 1:37 PM (UTC+11)

Automated Form Number	SciDev Water Services-HI0076 Gateway LTP-Site Team-HI0076-FOR-MR-32	
Date	Start: Thu, 17 Mar 2022, 12:00 am	End: Wed, 23 Mar 2022, 12:00 am

SBR Cycle Settings

Treatment Volume (m3)	Cycle Time (mins)	Blend Active / Inactive	Blend Volume (%)
95	330	n/a	n/a

Raw Leachate Riser Flow - FIT01

Date	Volume Total m3	Raw Leachate Feed Flow Rate (l/s)	Notes
Thu, 17 Mar 2022	104	2 l/s	
Fri, 18 Mar 2022	101		
Sat, 19 Mar 2022	103		
Sun, 20 Mar 2022	101		
Mon, 21 Mar 2022	99		
Tue, 22 Mar 2022	98		
Wed, 23 Mar 2022	97		

SBR Feed Flow - FIT02

Date	Volume Total m3	Notes
Thu, 17 Mar 2022	122	
Fri, 18 Mar 2022	97	
Sat, 19 Mar 2022	120	
Sun, 20 Feb 2022	96	
Mon, 21 Feb 2022	98	
Tue, 22 Mar 2022	122	
Wed, 23 Mar 2022	97	

Blend Line Flow - FIT02

Date	Volume Total m3	Notes

Trade Waste Discharge Flow - FIT05

Date	Volume Total m3	Notes
Thu, 17 Mar 2022	121	
Fri, 18 Mar 2022	104	
Sat, 19 Mar 2022	109	
Sun, 20 Mar 2022	122	
Mon, 21 Mar 2022	99	
Tue, 22 Mar 2022	115	

Date	Volume Total m3	Notes
Wed, 23 Mar 2022	117	

Treatment Volume Notes

- treatment volumes are consistent with treatment objectives and leachate extraction rates

Ammonia Field Test

Date	Result	Notes
Wed, 23 Mar 2022	00ppm	n/a

Trade Waste Sampling

Sampling Undertaken	Date of Sampling	Time Start	Time Finished	Volume Treated (m3)
No				

TW Discharge Criteria Met	Results Attached

Weekly Overview

- plant continued normal operation
- Temporary treated ground water discharge tank and infrastructure now accepting treated ground water on site
- Please ensure JHSW are informing scidev when they wish to pump water to the system and that a dewatering permit has been issued prior to sending this water.
- Automation of the Frac tank discharge infrastructure has been now been finalised.

Signature

Not signed yet.

Appendix D – Leachate Treatment Plant Maintenance Records

Gateway Monthly Maintenance Ch…

Charlie Watson
Created Fri, 28 Jan 2022, 7:30 AM (UTC+11)

SBR Feed Pump

Equipment Item	Action	Completed	Notes or Rectifications
SBR Feed Pump - FP01	• Check for abnormal noises and vibrations • Check for leaks (mechanical seal) • Check flow rate performance (flow rate pressure)	Yes	

Sludge Waste Pump

Equipment Item	Action	Completed	Notes or Rectifications
Sludge Waste Pump - SWP01	• Check for abnormal noises and vibrations • Check for leaks (mechanical seal) • Check flow rate performance (flow rate pressure)		

Mixing Pump

Equipment Item	Action	Completed	Notes or Rectifications
Mixing Pump - MP01	• Check for abnormal noises and vibrations • Check for leaks (mechanical seal) • Check flow rate performance (flow rate pressure)	Yes	

Discharge Pump

Equipment Item	Action	Completed	Notes or Rectifications
Discharge Pump - DP01	• Check for abnormal noises and vibrations • Check for leaks (mechanical seal) • Check flow rate performance (flow rate pressure)	Yes	

Submersible Drainage Pumps

Equipment Item	Action	Completed	Notes or Rectifications
Submersible Drainage Pumps SP01-02	• Remove debris from sump. check pump strainers for debris. check impeller is not impeded. • measure supply voltage • check for abnormal noises and vibrations.	Yes	

Chemical Dosing Pumps

Equipment Item	Action	Completed	Notes or Rectifications
Chemical Dosing Pumps DoP01-02	• check mechanic seal for leaks • check for abnormal noises and vibrations • check for corrosion • check electrical wiring for damage • check pump is meeting process requirements	Yes	

Flowmeters

Equipment Item	Action	Completed	Notes or Rectifications
Flowmeters FIT01-03	• visual check, ensuring localised display is operating as intended. • check pipe seal integrity • check cable entry points, glands and cover screws.	Yes	

pH Probe

Equipment Item	Action	Completed	Notes or Rectifications
pH Probe - PH01	• clean optical lens/ membrane to void fouling • recalibration	Yes	Some fluctuating values observed, re-calibration has settled this

DO Probe

Equipment Item	Action	Completed	Notes or Rectifications
DO Probe - DO01	• clean optical lens/ membrane to void fouling • recalibration • check measuring function (remove sensor from medium and measure air oxygen saturation index)	Yes	

SBR Tank

Equipment Item	Action	Completed	Notes or Rectifications
SBR Tank - SBR01	• Check anode and replace when function depleted • check tank water level • check for leakage • check walls are plumb • check tank externals and auxiliary components for corrosion • check tank internal walls for scum and debris build up • check for foreign objects in tank internal	Yes	Anodes still in function. Some minor build up of scum on internals of tank. no action required.

Discharge Tank

Equipment Item	Action	Completed	Notes or Rectifications
Discharge Tank - DT01	• check tank water level • check for leakage • check walls are plumb • check tank externals and auxiliariy components for corrosion • check tank internal walls for scum and debris build up • check for foreign objects in tank internal	Yes	some scum on internals of tank but no action required as only minimal and standard.

Chemical Storage Tanks

Equipment Item	Action	Completed	Notes or Rectifications
Chemical Storage Tanks - CT01-02	• Check all fittings for leaks • check bund for foreign objects or debris • check bund and tank walls for leaks	Yes	

Safety Shower / Eyewash

Equipment Item	Action	Completed	Notes or Rectifications
Safety Shower / Eye Wash - SS/EW01	• Check fittings for leaks • check water pressure from shower head and eye wash • operate shower weekly to ensure sufficient flow and flush sediment build-up	Yes	

Auto Sampler

Equipment Item	Action	Completed	Notes or Rectifications
Trade Waste Auto Sampler - AS01	• Check seal integrity • check cable entry points, glands and cover screws	Yes	

Signature

Charlie Watson, Fri, 28 Jan 2022, 7:36 am

Gateway Monthly Maintenance Ch…

Joel Reardon
Created Thu, 25 Nov 2021, 11:27 AM (UTC+11)

SBR Feed Pump

Equipment Item	Action	Completed	Notes or Rectifications
SBR Feed Pump - FP01	• Check for abnormal noises and vibrations • Check for leaks (mechanical seal) • Check flow rate performance (flow rate pressure)	Yes	Minor vibration during operation Operating at 16.8lps @ 1.9bar (manually restricted)

Sludge Waste Pump

Equipment Item	Action	Completed	Notes or Rectifications
Sludge Waste Pump - SWP01	• Check for abnormal noises and vibrations • Check for leaks (mechanical seal) • Check flow rate performance (flow rate pressure)	Yes	No current leaks or excessive vibration

Mixing Pump

Equipment Item	Action	Completed	Notes or Rectifications
Mixing Pump - MP01	• Check for abnormal noises and vibrations • Check for leaks (mechanical seal) • Check flow rate performance (flow rate pressure)	Yes	Operating at 1bar @ 65% No vibrations or leaks evident

Discharge Pump

Equipment Item	Action	Completed	Notes or Rectifications
Discharge Pump - DP01	• Check for abnormal noises and vibrations • Check for leaks (mechanical seal) • Check flow rate performance (flow rate pressure)	Yes	No vibration or leaks evident Operating at 0.3bar @ 4lps

Submersible Drainage Pumps

Equipment Item	Action	Completed	Notes or Rectifications
Submersible Drainage Pumps SP01-02	• Remove debris from sump. check pump strainers for debris. check impeller is not impeded. • measure supply voltage • check for abnormal noises and vibrations.	Yes	Strainers cleaned and pump operation tested

Chemical Dosing Pumps

Equipment Item	Action	Completed	Notes or Rectifications
Chemical Dosing Pumps DoP01-02	• check mechanic seal for leaks • check for abnormal noises and vibrations • check for corrosion • check electrical wiring for damage • check pump is meeting process requirements	Yes	No leaks or abnormal vibration evident on dop01 Discharge fitting on dop02 (antifoam) small leak. Tightened and applied thread tape.

Flowmeters

Equipment Item	Action	Completed	Notes or Rectifications
Flowmeters FIT01-03	• visual check, ensuring localised display is operating as intended. • check pipe seal integrity • check cable entry points, glands and cover screws.	Yes	Operation as intended

pH Probe

Equipment Item	Action	Completed	Notes or Rectifications
pH Probe - PH01	• clean optical lens/ membrane to void fouling • recalibration	Yes	Recalibration completed and optical lens cleaned.

DO Probe

Equipment Item	Action	Completed	Notes or Rectifications
DO Probe - DO01	• clean optical lens/ membrane to void fouling • recalibration • check measuring function (remove sensor from medium and measure air oxygen saturation index)	Yes	Air saturation calibration completed. Clean optical lens and probe

SBR Tank

Equipment Item	Action	Completed	Notes or Rectifications
SBR Tank - SBR01	• Check anode and replace when function depleted • check tank water level • check for leakage • check walls are plumb • check tank externals and auxiliary components for corrosion • check tank internal walls for scum and debris build up • check for foreign objects in tank internal	Yes	Anodes still sufficient for use. No leaks evident. No foreign objects Tank in like new condition.

Discharge Tank

Equipment Item	Action	Completed	Notes or Rectifications
Discharge Tank - DT01	• check tank water level • check for leakage • check walls are plumb • check tank externals and auxiliariy components for corrosion • check tank internal walls for scum and debris build up • check for foreign objects in tank internal	Yes	No leaks evident. Tank in like new condition. No foreign objects.

Chemical Storage Tanks

Equipment Item	Action	Completed	Notes or Rectifications
Chemical Storage Tanks - CT01-02	• Check all fittings for leaks • check bund for foreign objects or debris • check bund and tank walls for leaks	Yes	

Safety Shower / Eyewash

Equipment Item	Action	Completed	Notes or Rectifications
Safety Shower / Eye Wash - SS/EW01	• Check fittings for leaks • check water pressure from shower head and eye wash • operate shower weekly to ensure sufficient flow and flush sediment build-up	Yes	Sufficient pressure

Auto Sampler

Equipment Item	Action	Completed	Notes or Rectifications
Trade Waste Auto Sampler - AS01	• Check seal integrity • check cable entry points, glands and cover screws	Yes	No issues evident

Signature

Joel Reardon, Thu, 25 Nov 2021, 1:09 pm

Charlie Watson, Wed, 01 Dec 2021, 1:01 pm