

Lamby Way annual report January 2020 – December 2020

**With reference to section 4.2 of Lamby Way Landfill site permit Variation
notice UP3130MA of permit JP3239ST**



Lamby Way Landfill Site

Variation Notice UP3130MA

2019 Annual Report as per Schedule 4.2 sub section 4.2.1

(a) Review of result - See Appendix 1

(b) Annual Improvement targets

Since 1st January 2020:

1. Ongoing maintenance of all perimeter gas sampling points. Four valves/well heads were replaced and all surrounding vegetation was cleared around sampling points to improve access.
2. Vegetation clearing – Several sampling location are in constant risk of being lost due to plant growth, predominantly C1, C2, C3, C4 and C5.
3. LTP maintenance tender has been awarded to Enitail. Site access has been problematic during Covid lockdowns. NRW have been passed details of maintenance contract and Enitail's details.
4. Gareth Ffoulkes (COTC) will leave the Landfill and Aftercare manager post on 01/02/21. Martin Williams will take over all duties. Contact details have been passed to NRW and an initial contact meeting has been scheduled.

(c) Energy consumption of site as set out in schedule 5 Table S5.3

(d) Water consumption of site as set out in schedule 5 Table S5.3

Table S5.3 Performance Parameters				
Parameter		Frequency of assessment	Annual total	Unit
Potable water use		Annual	5989	Cubic meters
Energy used (including for leachate treatment)		Annual	197.42	MWh electricity
Non potable water		Annual	N/A	Cubic meters

(e) Annual production / treatment as set out in schedule 5 Table S5.2

Table S5.2 Annual Production /Treatment	
Leachate:	Cubic metres/ year
Disposed of off site:	0
Disposed of to any onsite effluent treatment plant;	12,761 m3
Recalculated into the waste mass.	0 m3
Surface Water and / or groundwater:	Cubic metres / year

Disposed of off site;	Not measured
Disposed of to any onsite effluent treatment plant;	0
Landfill gas:	Normalised cubic metres/ year
Combustion in flares	1,574,988 m ³
Combustion in gas engines;	4,587,190 m ³
Other methods of gas utilisation	N/A

(f) Details of an contamination or decontamination of the site

- No waste has been rejected from site – Landfill is closed
- No known acts of vandalism and/or unauthorised activity are known to have caused the introduction of any unauthorised materials.
- No fuel or oil spills have been reported. The site maintains a good supply of spill kits in the event that they are required.
- Surface water inspections have not produced any recordings of visible oils and greases in Surface Water sampling manholes.

(g) Topographical survey required by condition 3.6.3

See Appendix 4.0 - Drawing – ‘Lamby Way Landfill Site – Topographical Plan’

(h) Volumetric difference (m3) between most recent topographical survey and previous annual topographical survey i.e. additional volume of landfill void that is occupied by waste.

See attached plan **TO FOLLOW**

(i) Assessment of settlement behaviour difference (m3) between most recent topographical survey and previous annual topographical survey for areas that did not receive waste between surveys.

See attached plan **TO FOLLOW**

(j) Calculation of remaining capacity (m3) derived from the pre-settlement contours and the most recent topographical survey.

n/a – Landfill closed, no further tipping possible

See additional map *Annual report section (i)*

(k) Compliance testing undertaken within this period

1. Six monthly calibration of G5000 Gas meter completed
2. Calibration of LTP flow meter to Mcerts standard. Mcerts registered flow meter installed and the plant is due for full Mcerts accreditation maintained since 15th March 2013.

Appendix 1 – Review of Results

Lamby Way: Data Report – 2020

Monitoring data for the Lamby Way landfill from January 2020 to December 2020 at Lamby Way Landfill site.

Data included for Perimeter Gas, Leachate, Groundwater and Surface water in accordance with Schedule 4 – Emissions & Monitoring plans for permit variation number UP3130MA.(Variation Notice UP3130MA 2020 Annual Report as per Schedule 4.2 sub section 4.2.1).

Summary of missing Data.

Some of the sampling locations at Lamby Way are not accessible, the details of which are shown below along with proposed / implemented resolutions.

Groundwater borehole (C7) – Borehole is blocked by debris which can not be extracted.

Groundwater borehole (C15) – Sampling not always possible due to borehole being intermittently dry.

Leachate well (SL1) - Borehole is dry, no action possible. Situation will be monitored.

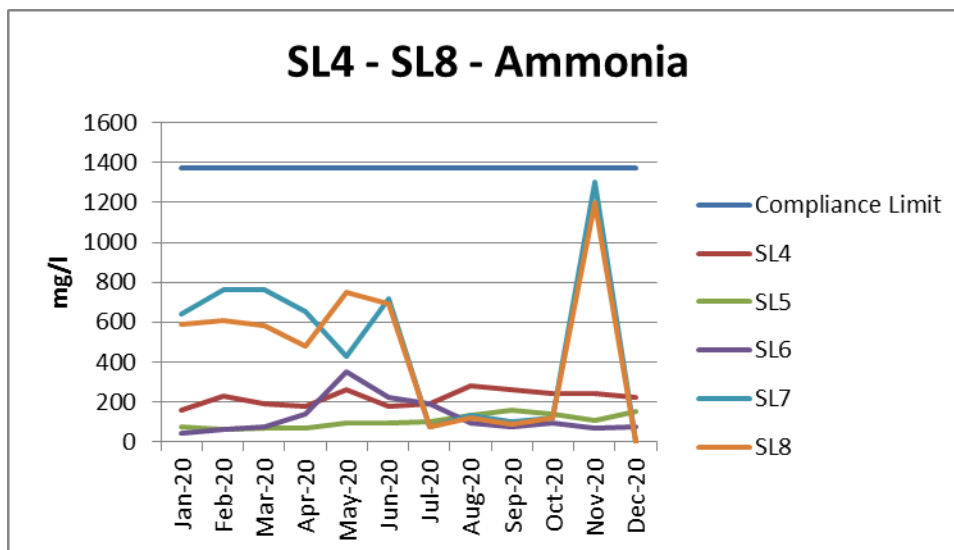
Leachate well (SL2) - Borehole is dry, no action possible. Situation will be monitored.

Leachate well (SL3) - Borehole is blocked below surface, reason unknown.

Leachate Data (SL4– SL8)

Ammoniacal Nitrogen (Ammonia)

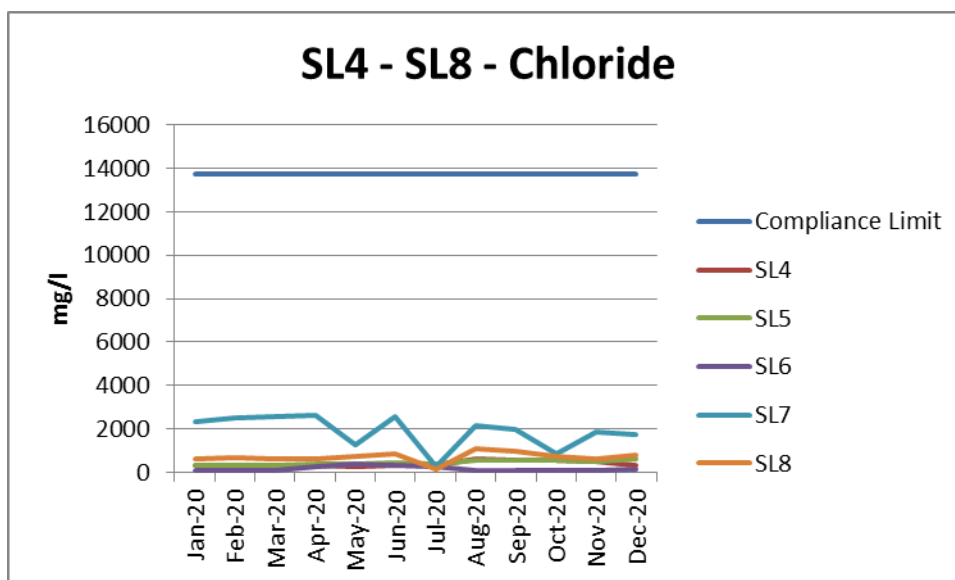
Ammoniacal nitrogen ($\text{NH}_3\text{-N}$) is a measure commonly used for testing the quantity of Ammonium ions, derived naturally via organic processes, in water or waste liquids. It is a measure used mainly for quantifying values in waste treatment and water purification systems, as well as a measure of the health of natural and manmade water reserves.



There were no breaches of the trigger level detected in 2020.

Chloride

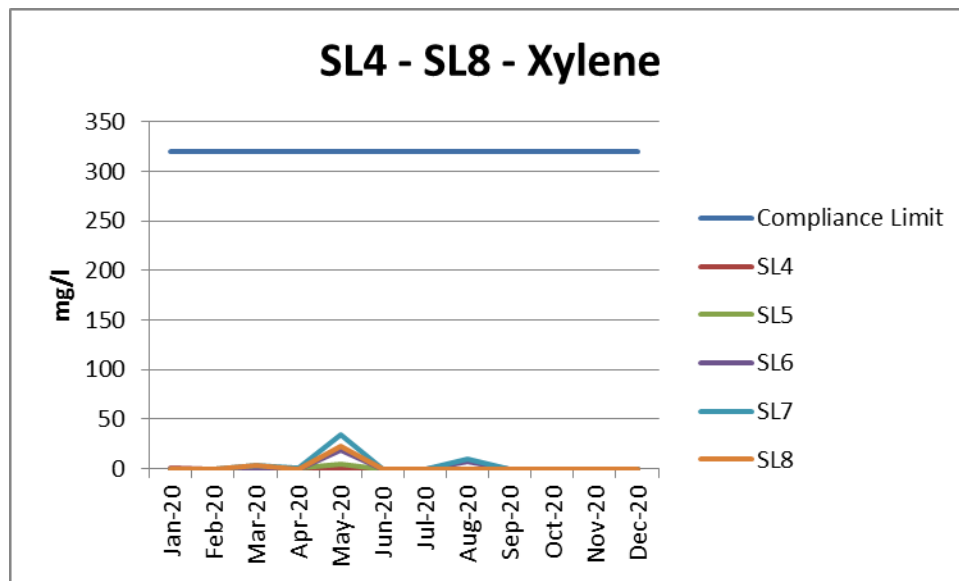
Chloride levels in a waste mass are closely linked to naturally occurring sea water. It is measured to determine if there is any ingress of sea water (or saline ground waters) into a waste mass.



There were no breaches of the trigger level detected in 2020.

Xylene

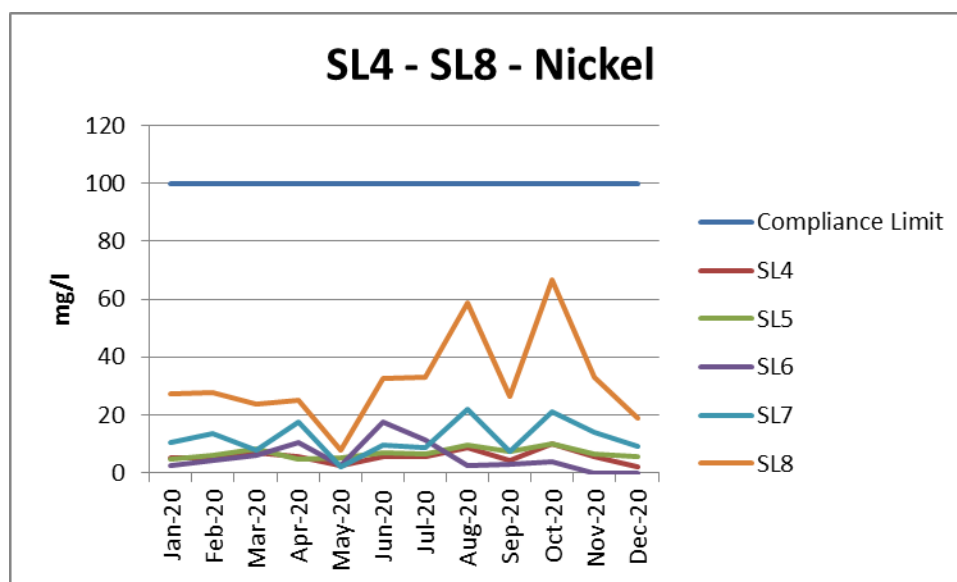
In the presence of Acidic conditions, Xylene can be the pre-cursor to more hazardous compounds of the Benzene family, especially in the presence of Chloride.



There were no breaches of the trigger level detected in 2020.

Nickel

Nickel occurs naturally in soils, groundwater, and surface water. As with most heavy metals, nickel can damage the heart and liver of animals exposed to large amounts over a prolonged period of time.



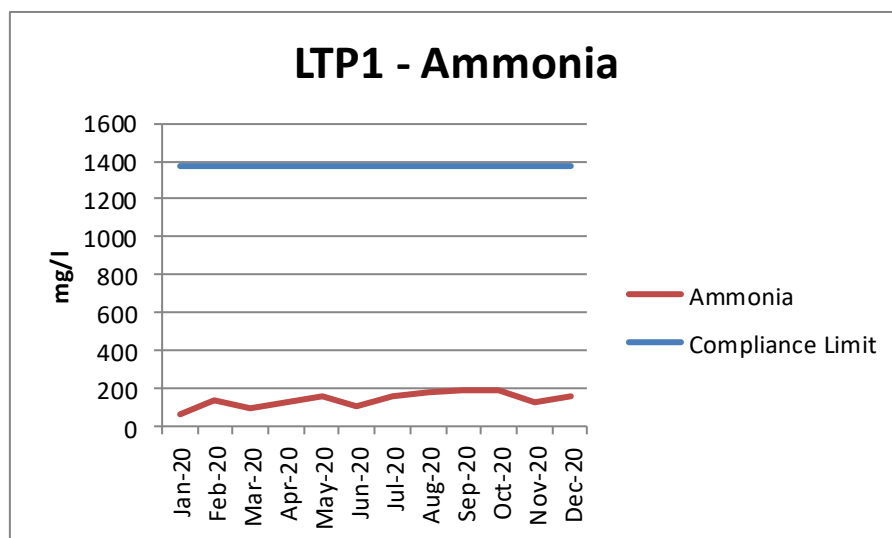
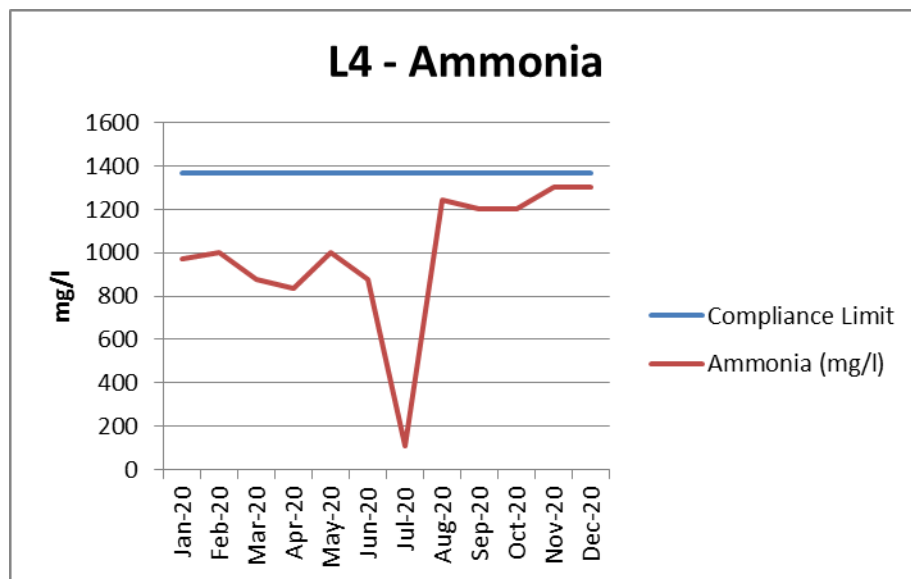
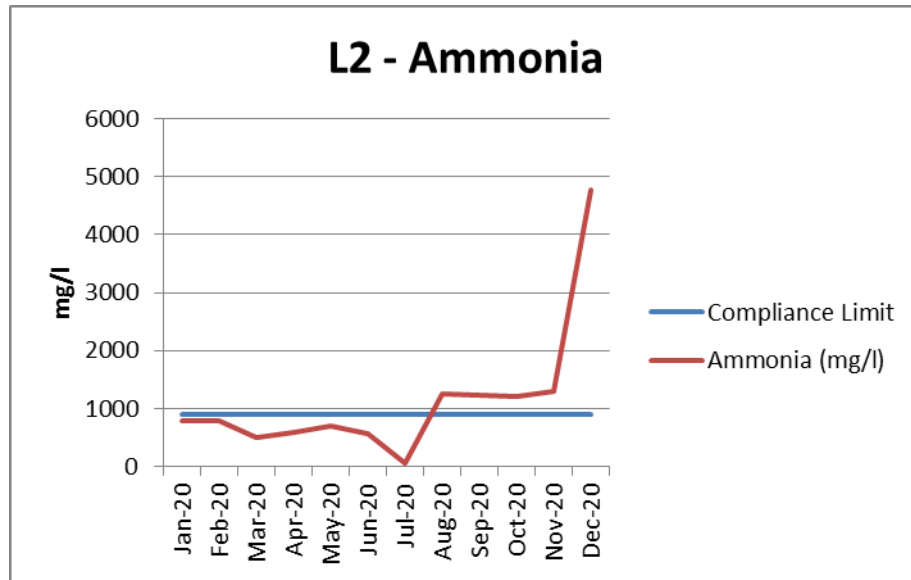
There were no breaches of the trigger level detected in 2020.

Leachate Data – (L2, L4, LTP1)

Lamby Way East leachate is sampled from three locations, L2, L4 and LTP1.

Ammoniacal Nitrogen (Ammonia)

The trigger levels for L2 is 904mg/l and the trigger level for L4 and LTP1 is 1370mg/l.

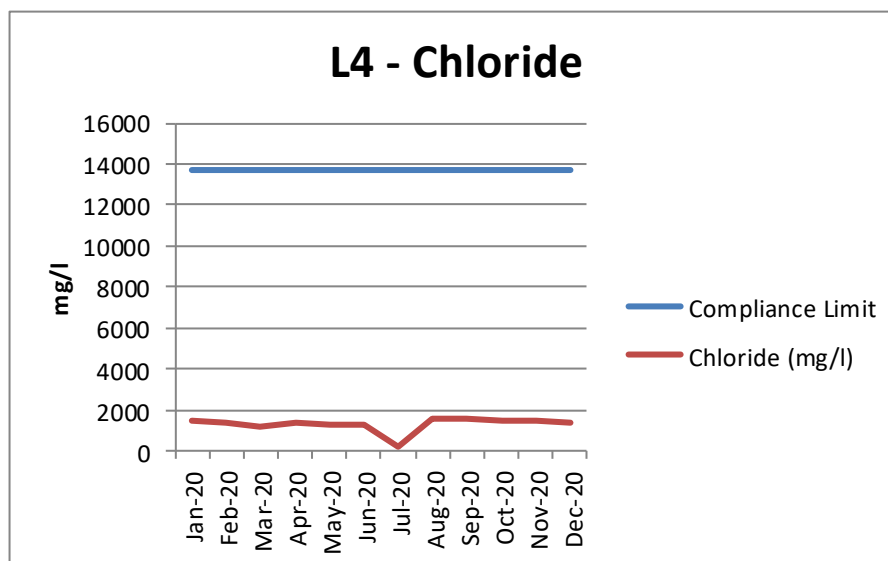
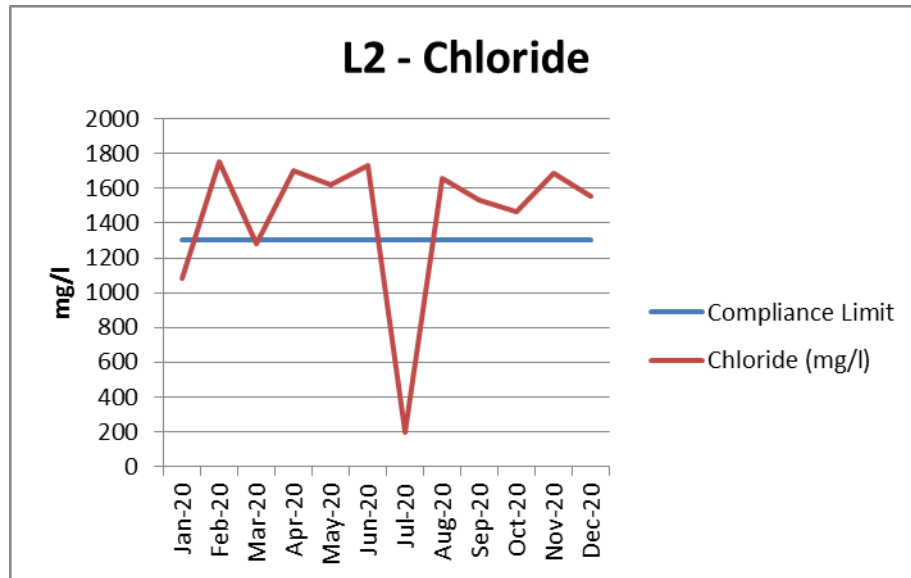


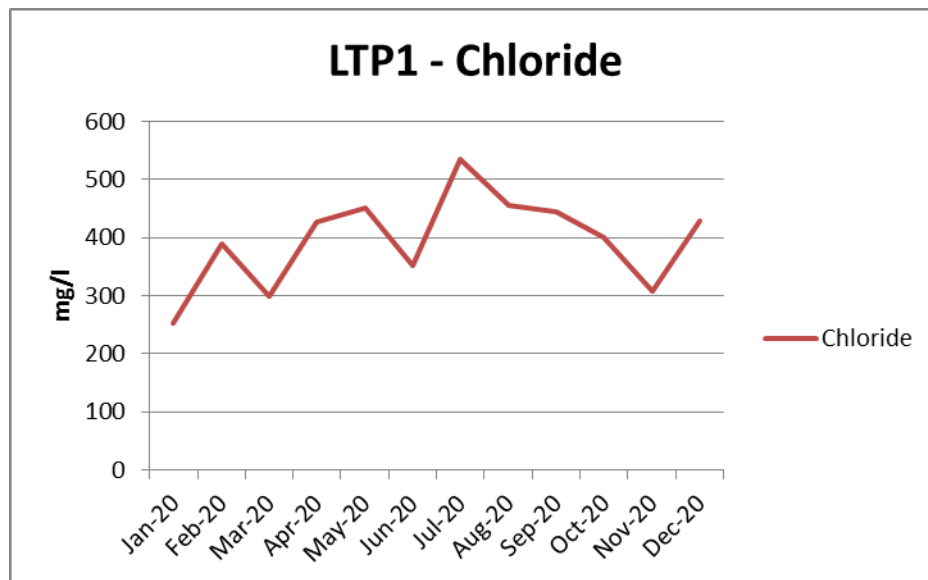
L2 had 5 breaches of the 904mg/l trigger level.

There were no breaches from L4 and LTP1.

Chloride

There are different trigger levels in place for L2 and L4 and no trigger level for LTP1.



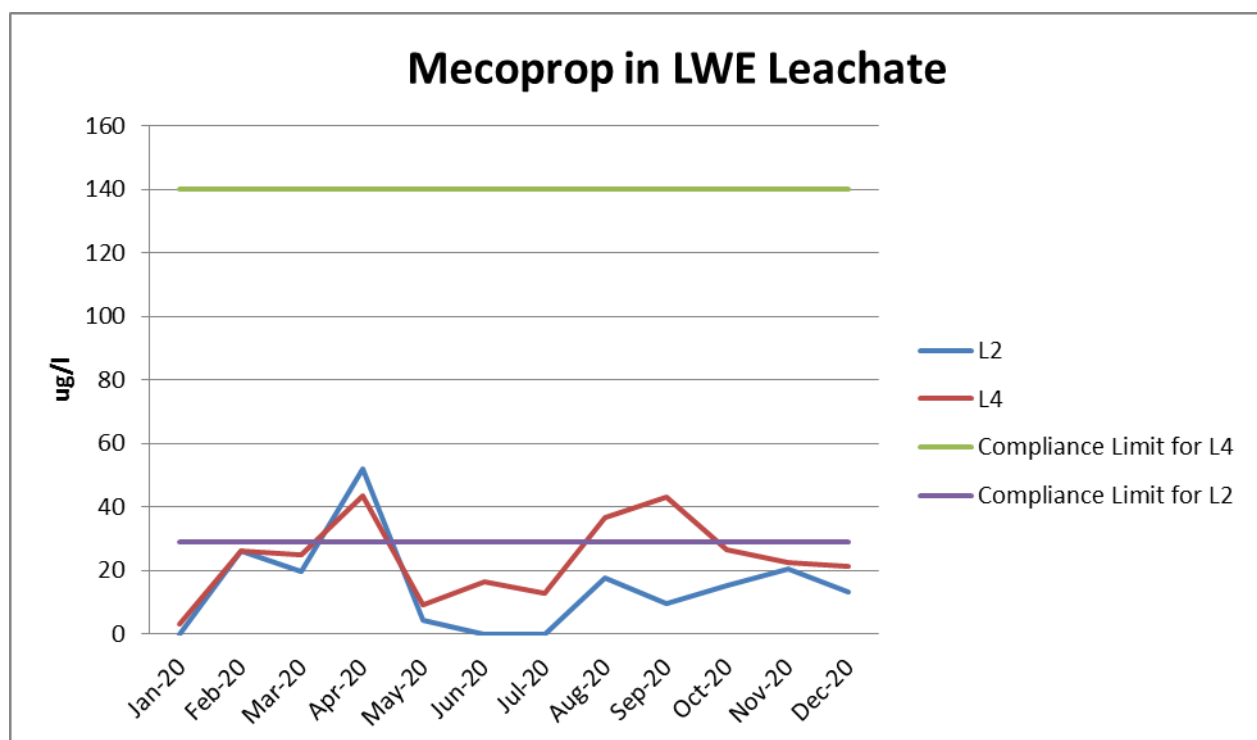


L2 had 9 breaches of the 1306mg/l trigger level.

There were no breaches for L4 or L7.

Mecoprop

Mecoprop or Methylchlorophenoxypropionic acid (MCP) is a common general use herbicide found in many household weed killers and "weed-and-feed" type lawn fertilizers.

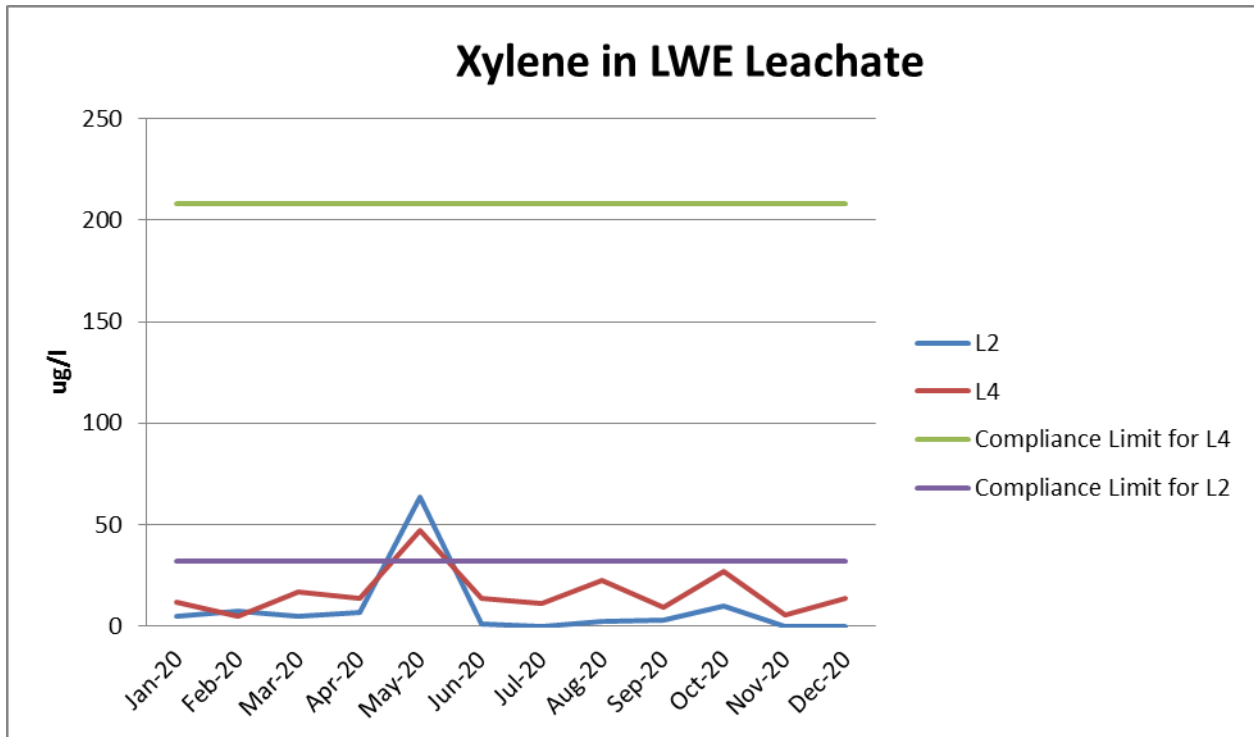


There are two trigger levels, 29ug/l for L2 and 140ug/l for L4 and LTP1.

L2 breached the trigger level once in April.

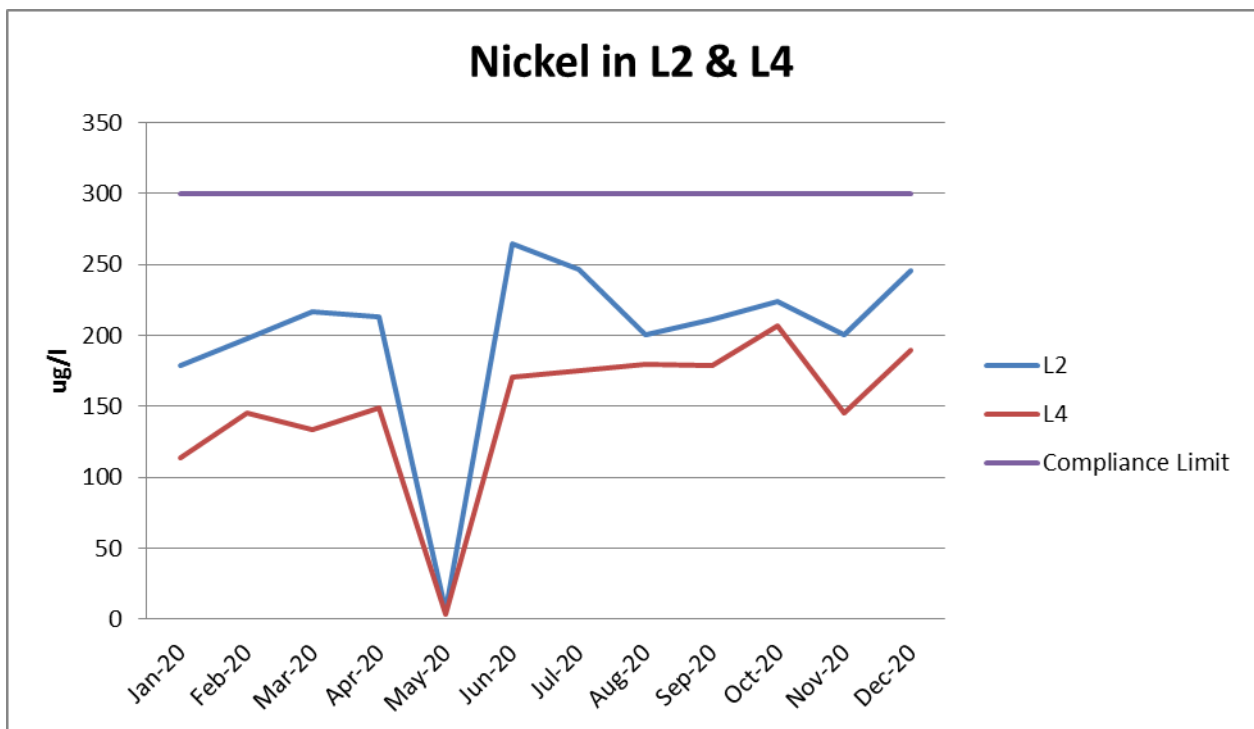
No mecoprop data from LTP1 is not reported as it is not required by the permit.

Xylene



There was 1 breach of the 32ug/l trigger level for L2 and no breaches of the 208ug/l trigger for L4.

Nickel



The trigger level for Nickel at these locations is 300ug/l

There were no breaches in 2020.

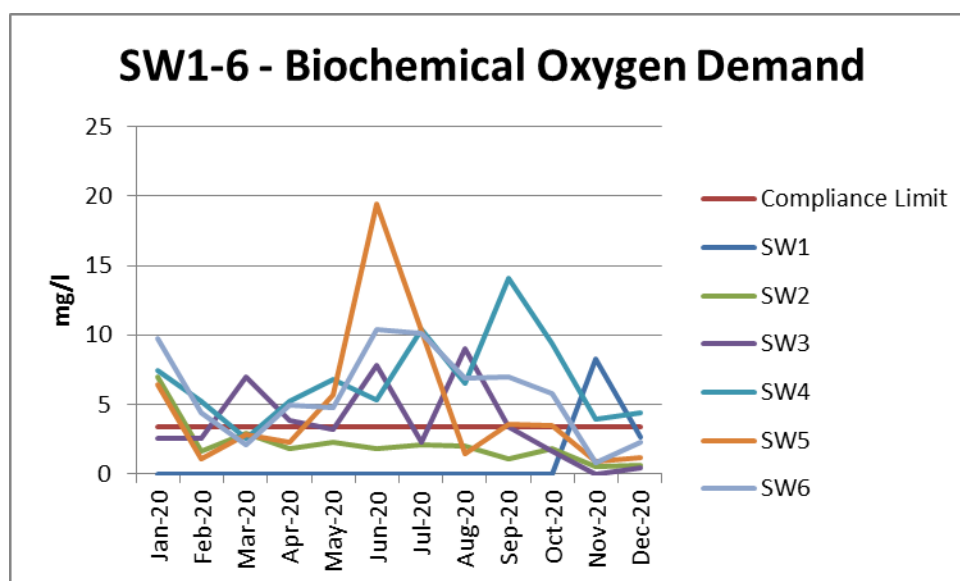
Surface Water (SW1-SW6)

There are 6 surface water monitoring points, designated SW1 to SW6.

SW6 on is sometimes referred to as Outfall D, in reference to when the site was a dilute and disperse site. This report names Outfall D as SW6.

Biochemical Oxygen Demand (BOD)

Biochemical Oxygen Demand (or BOD) is the amount of dissolved oxygen needed by aerobic biological organisms in a body of water to break down organic material present in a given water sample at certain temperature over a specific time period. The term also refers to a chemical procedure for determining this amount. This is not a precise quantitative test, although it is widely used as an indication of the organic quality of water. The BOD value is most commonly expressed in milligrams of oxygen consumed per litre of sample during 5 days of incubation at 20 °C.

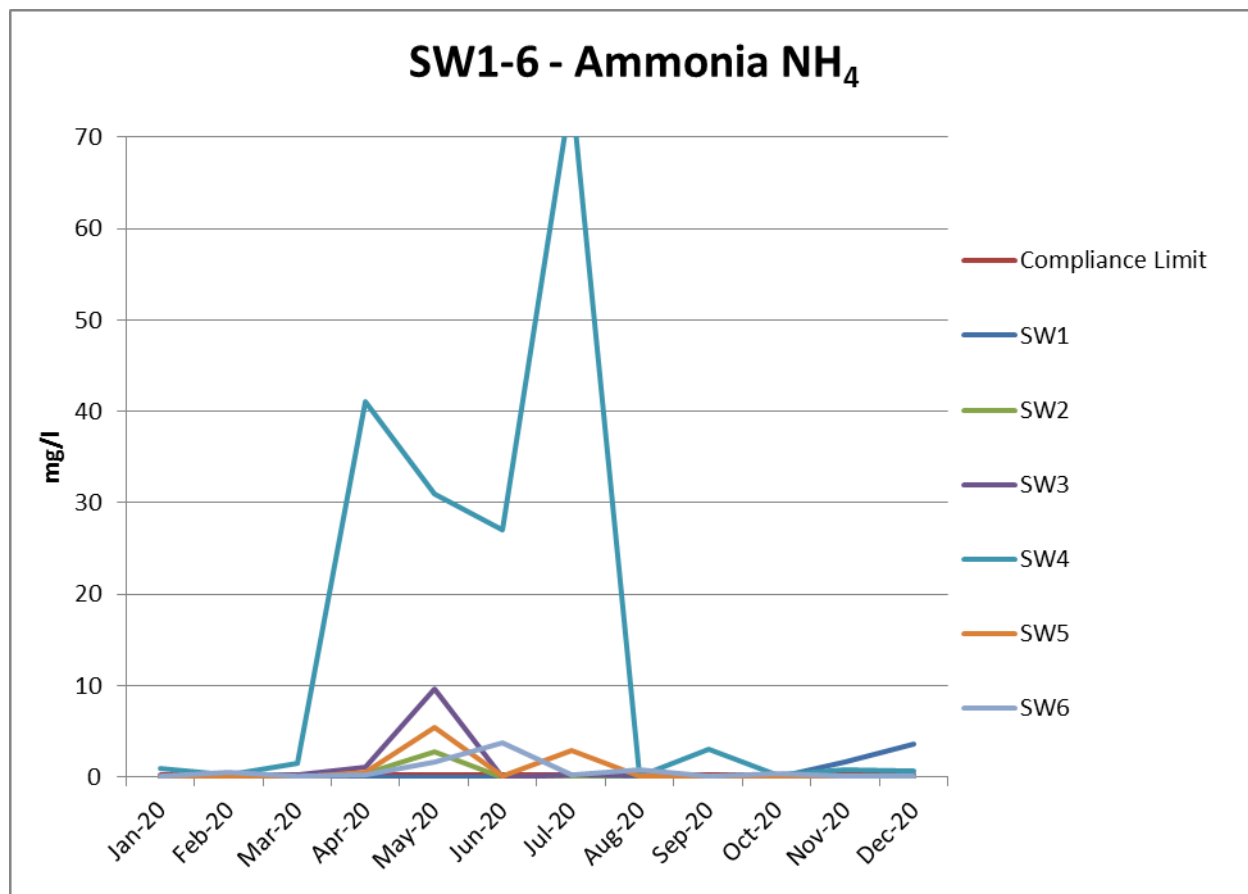


This graph shows the distribution of BOD data in surface water in 2020. In total there were 32 breaches of the 3.35mg/l limit with the following distribution.

SW1	1
SW2	1
SW3	4
SW4	11
SW5	6
SW6	9
	32

Only two samples were obtained from SW1 in November and December 2020. No sample could be obtained during other monitoring periods.

Ammoniacal Nitrogen (Ammonia)



There were 26 breaches of the 0.17mg/l limit in 2020.

Only two samples were obtained from SW1 which breached the limit. The distribution of breaches per sampling location is shown below.

SW1	2
SW2	2
SW3	3
SW4	9
SW5	3
SW6	7
	26

Total

Ground Water (C1-C22)

Ammoniacal Nitrogen (Ammonia)

The trigger levels for the GW boreholes are shown below, as modified by the most recent Hydrological Risk Assessment.

C1	Am Ni	N/A
C2	Am Ni	2.09 mg/l
C3	Am Ni	8.94 mg/l
C4	Am Ni	11.4 mg/l
C5	Am Ni	20.87 mg/l
C6	Am Ni	5.02 mg/l
C8	Am Ni	12.07 mg/l
C10	Am Ni	22.62 mg/l
C12	Am Ni	19.49 mg/l
C14	Am Ni	25.88 mg/l
C16	Am Ni	12.62 mg/l
C18	Am Ni	18.39 mg/l
C19	Am Ni	19.03 mg/l
C20	Am Ni	15.4 mg/l
C21	Am Ni	9.65 mg/l
C22	Am Ni	12.10 mg/l

In total there were 12 breaches of the new HRA trigger levels, with C12 breaching the trigger limit most frequently April (110mg/l), May (21mg/l), July (22mg/l), September (21mg/l), October (20mg/l) and November (23mg/l).

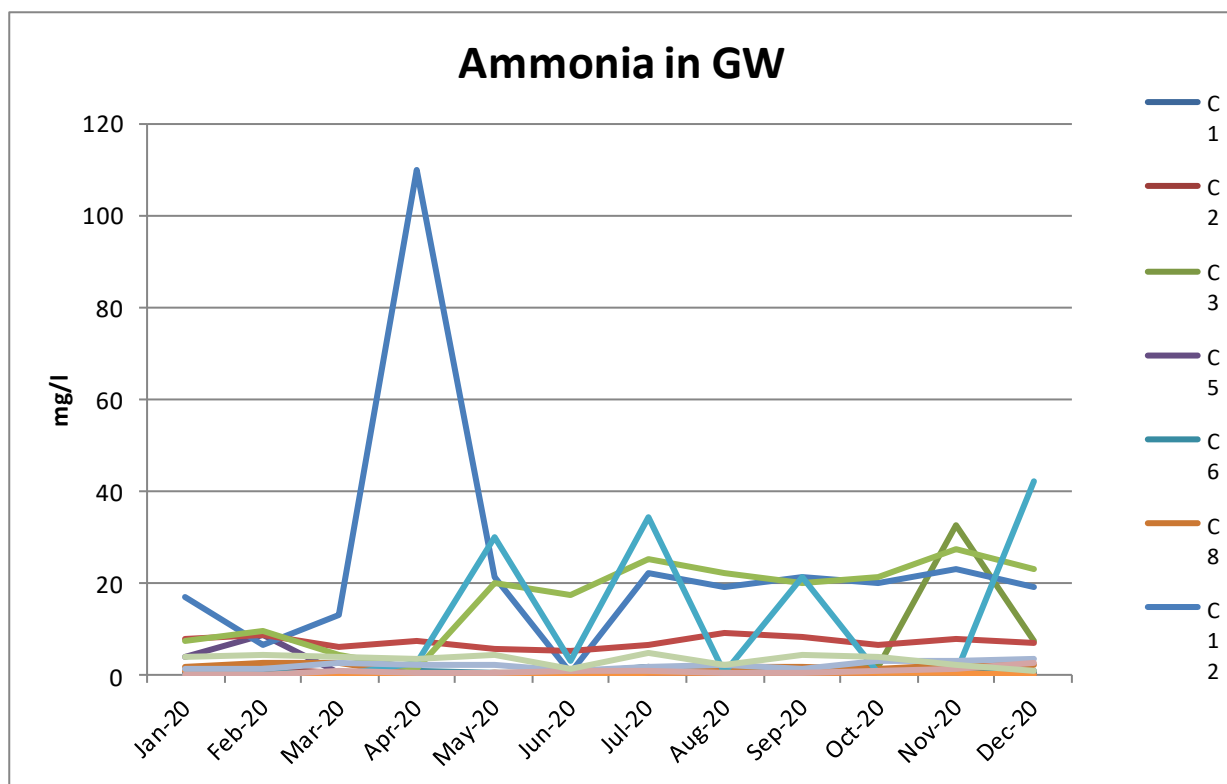
C3 only breached the trigger level once November with a value of 32.4mg/l.

C14 only breached the trigger level once November with a value of 27mg/l.

C18 breached four times during the period. May (30mg/l), July (34mg/l), September (21mg/l) and December (42mg/l).

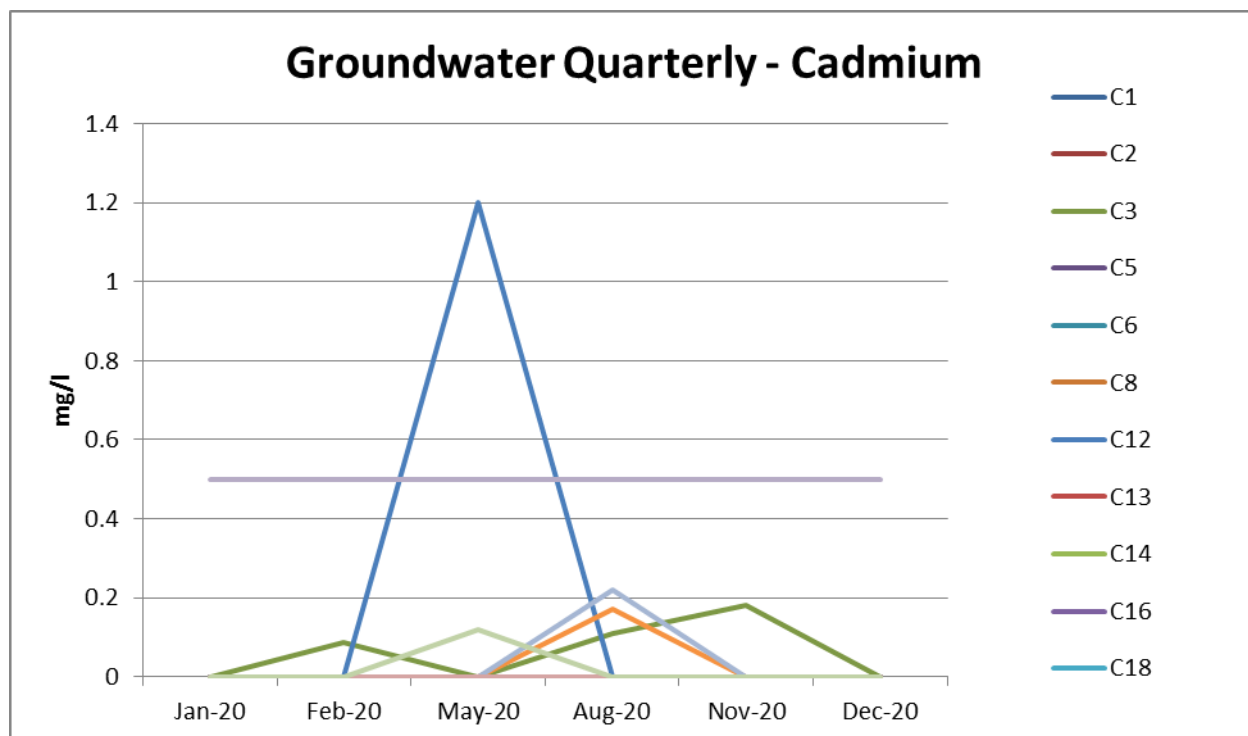
The distribution of breaches is shown below.

C3	1
C12	6
C14	1
C18	4
	12 Total



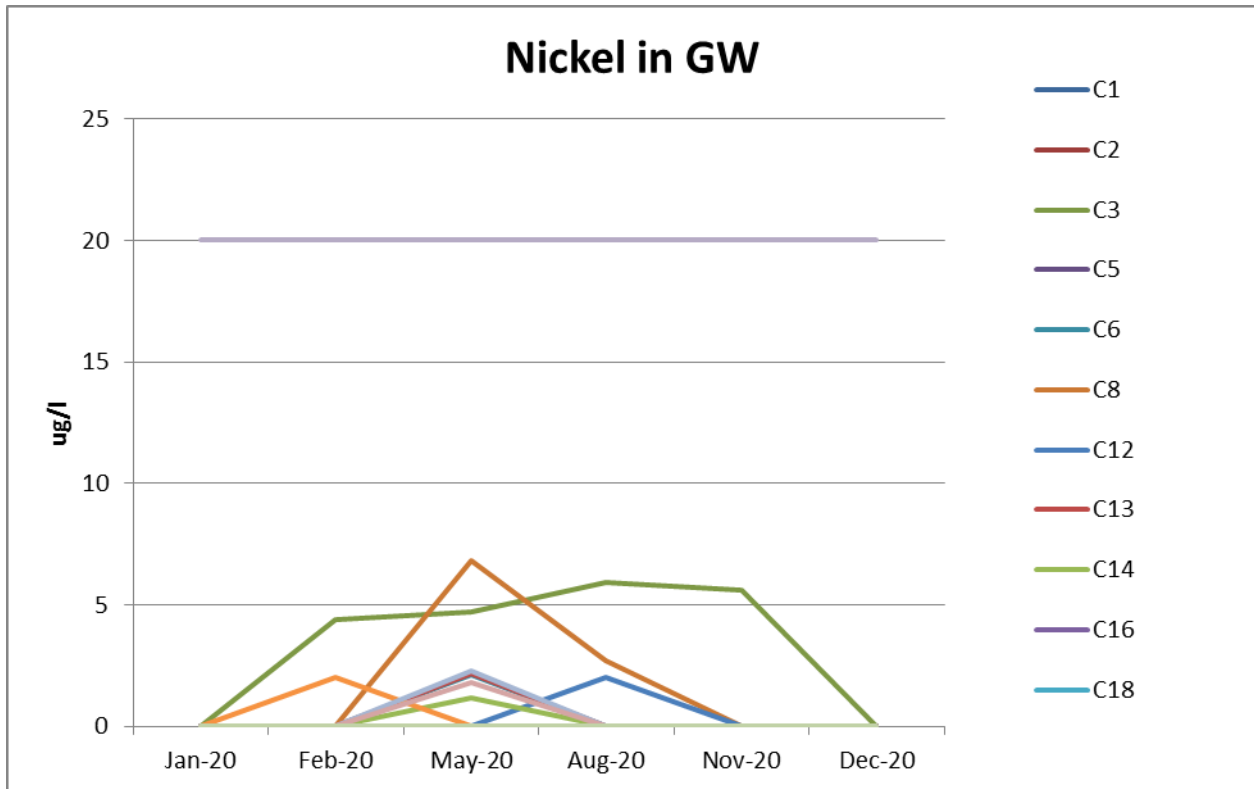
Cadmium

Cadmium can be found in low concentrations in rocks, coal, and petroleum and enters the ground and surface water when dissolved by acidic waters. It may enter the environment from industrial discharge, mining waste, metal plating, water pipes, batteries, paints and pigments, plastic stabilizers, and landfill leachate. Cadmium replaces zinc bio chemically in the body and can cause severe health implications such as high blood pressure, liver and kidney damage, and anaemia. It is toxic to aquatic organisms.



There was 1 breach of the Cadmium trigger level in 2020 from borehole C12 in May 1.2mg/l.

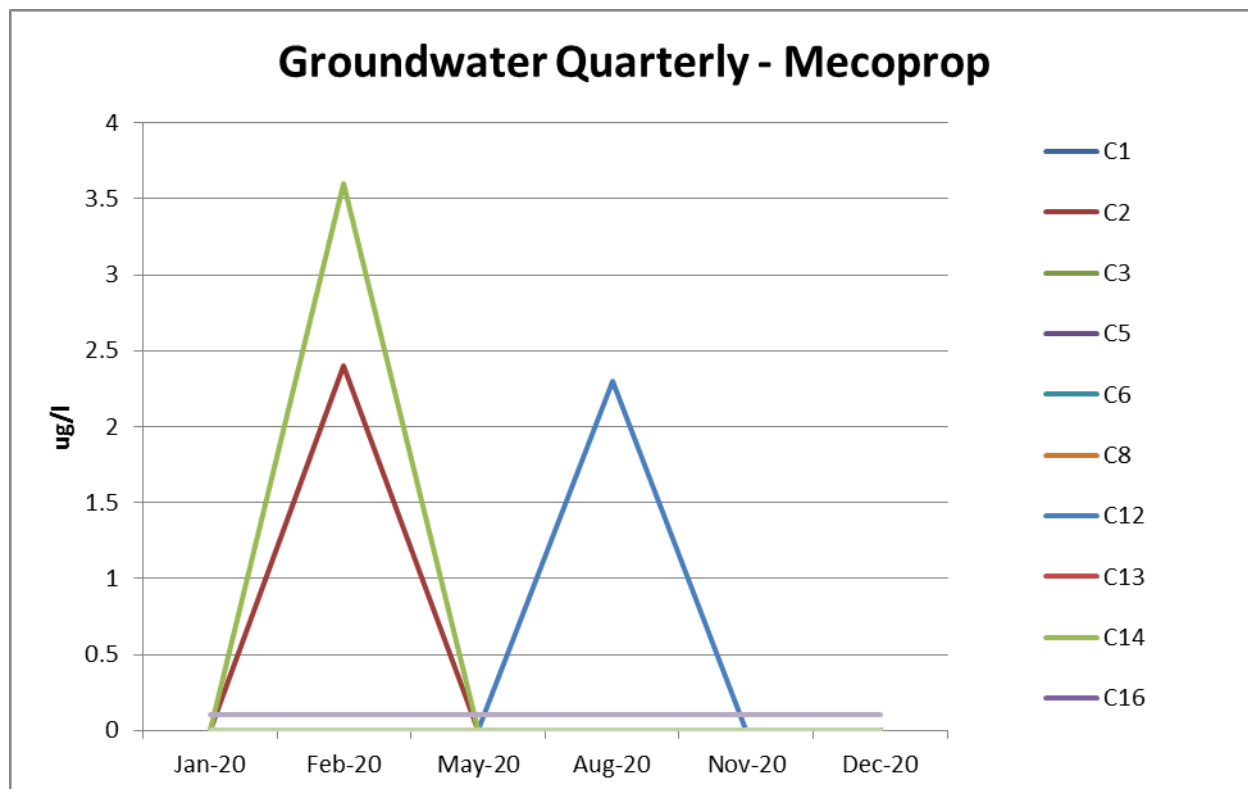
Nickel



The trigger level for Nickel is 20ug/l.

There were no breaches for Nickel in 2020.

Mecoprop



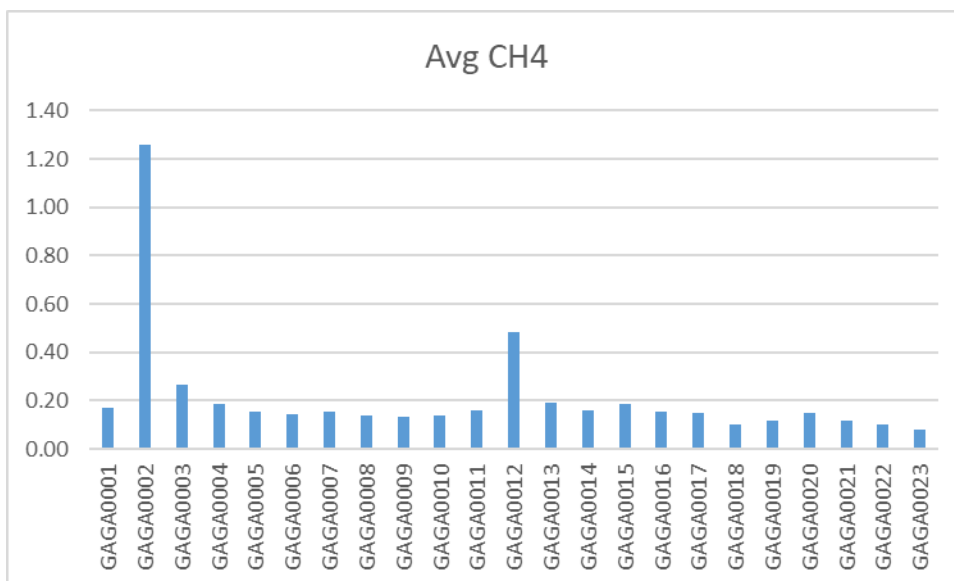
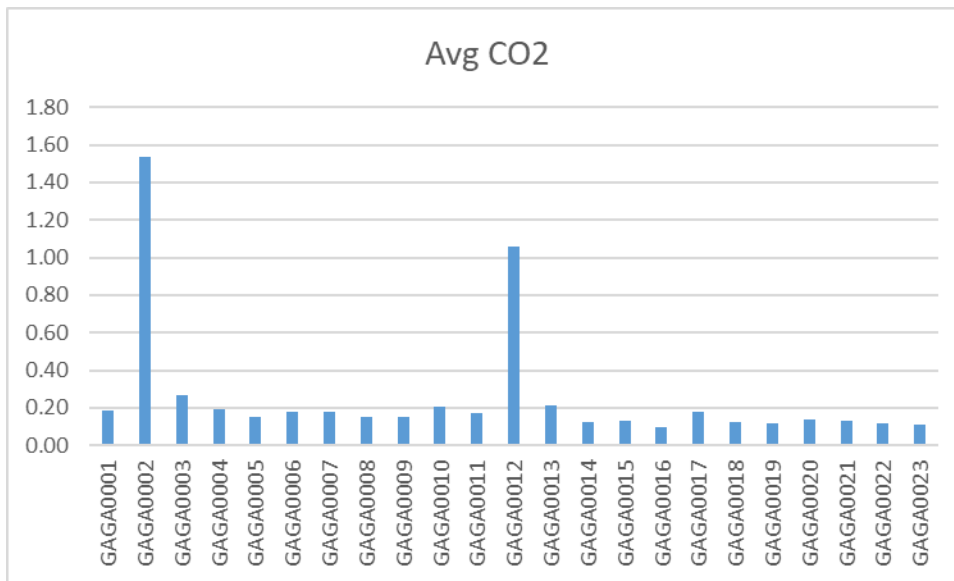
There were a total of 3 breaches of the 0.1ug/l trigger level. Two of these occurred during February C2 (2.4ug/l) and C14 (3.6ug/l). C12 also breached in August with a value of 2.3ug/l.

Xylene

No breaches of the 1ug/l trigger level were detected in 2020. As with the mecoprop, all results were below the detection limit and were reported as <0.1ug/l.

Perimeter Gas Data

As with all other previously reported years, the highest volumes of CO₂ and CH₄ are detected within G2 and G12, both located on the eastern perimeter of Lamby Way Landfill site.



Leachate volumes

Date	Meter reading	Volumes Discharged
02/01/2020	366425	
07/01/2020	367074	649
09/01/2020	367219	145
10/01/2020	367266	47
13/01/2020	367301	35
15/01/2020	367579	278
17/01/2020	367696	117
20/01/2020	367705	9
21/01/2020	367729	24
22/01/2020	367798	69
23/01/2020	367816	18
24/01/2020	367965	149
27/01/2020	368032	67
28/01/2020	368215	183
30/01/2020	368364	149
04/02/2020	368532	168
07/02/2020	368568	36
10/02/2020	368918	350
11/02/2020	368961	43
13/02/2020	368963	2
14/02/2020	369065	102
17/02/2020	369167	102
19/02/2020	369193	26
21/02/2020	369226	33
24/02/2020	369360	134
25/02/2020	369383	23
26/02/2020	369407	24
27/02/2020	369631	224
02/03/2020	369718	87
03/03/2020	369899	181
05/03/2020	369942	43
06/03/2020	370034	92
09/03/2020	370067	33
10/03/2020	370082	15
13/03/2020	370352	270
17/03/2020	370435	83
19/03/2020	370595	160
23/03/2020	370605	10
26/03/2020	370936	331
31/03/2020	370946	10
02/04/2020	371197	251
03/04/2020	371260	63
06/04/2020	371412	152
08/04/2020	371439	27
09/04/2020	371504	65
15/04/2020	371696	192
16/04/2020	371767	71

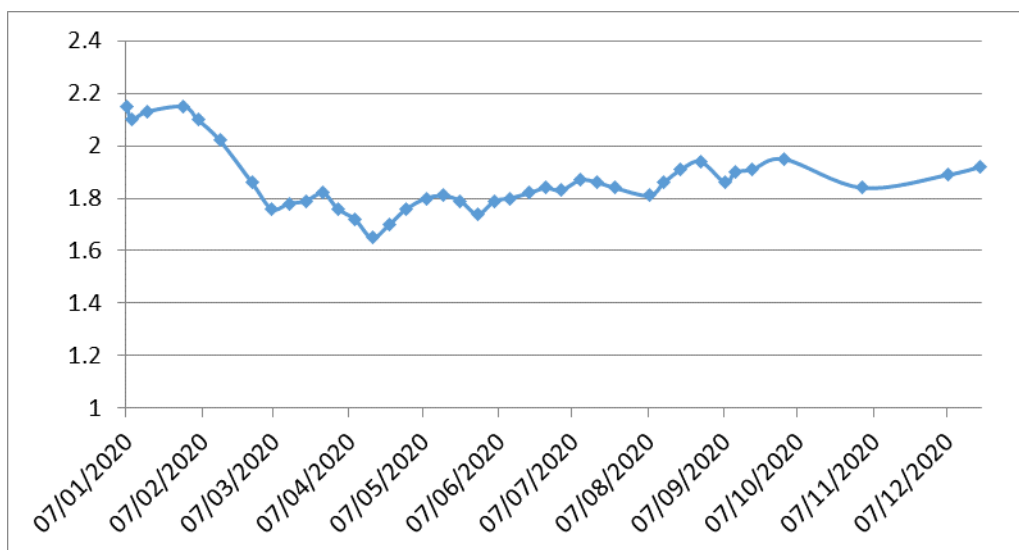
17/04/2020	371768	1
20/04/2020	371948	180
23/04/2020	372065	117
24/04/2020	372114	49
27/04/2020	372243	129
30/04/2020	372397	154
01/05/2020	372427	30
04/05/2020	372466	39
06/05/2020	372520	54
11/05/2020	372699	179
12/05/2020	372722	23
15/05/2020	372821	99
18/05/2020	372915	94
20/05/2020	372983	68
21/05/2020	373018	35
22/05/2020	373065	47
26/05/2020	373122	57
27/05/2020	373151	29
29/05/2020	373233	82
01/06/2020	373313	80
04/06/2020	373317	4
05/06/2020	373318	1
08/06/2020	373322	4
11/06/2020	373326	4
15/06/2020	373665	339
17/06/2020	373760	95
19/06/2020	373840	80
22/06/2020	373846	6
24/06/2020	373909	63
26/06/2020	373942	33
29/06/2020	374133	191
01/07/2020	374226	93
02/07/2020	374243	17
03/07/2020	374260	17
06/07/2020	374327	67
08/07/2020	374339	12
10/07/2020	374344	5
13/07/2020	374351	7
14/07/2020	374362	11
17/07/2020	374362	0
20/07/2020	374392	30
21/07/2020	374439	47
22/07/2020	374503	64
23/07/2020	374579	76
24/07/2020	374630	51
27/07/2020	374646	16
30/07/2020	374819	173
03/08/2020	375028	209
05/08/2020	375054	26
07/08/2020	375129	75

10/08/2020	375249	120
11/08/2020	375285	36
13/08/2020	375355	70
14/08/2020	375359	4
17/08/2020	375396	37
21/08/2020	375596	200
24/08/2020	375625	29
26/08/2020	375702	77
27/08/2020	375702	0
28/08/2020	375745	43
01/09/2020	375750	5
03/09/2020	375779	29
07/09/2020	375780	1
08/09/2020	375790	10
10/09/2020	375791	1
13/10/2020	375814	23
14/10/2020	376063	249
15/10/2020	376222	159
16/10/2020	376315	93
20/10/2020	376651	336
22/10/2020	376740	89
23/10/2020	376786	46
26/10/2020	376953	167
27/10/2020	376993	40
28/10/2020	377029	36
29/10/2020	377039	10
30/10/2020	377068	29
02/11/2020	377222	154
04/11/2020	377226	4
06/11/2020	377270	44
09/11/2020	377301	31
10/11/2020	377402	101
12/11/2020	377512	110
13/11/2020	377555	43
16/11/2020	377681	126
18/11/2020	377717	36
20/11/2020	377729	12
23/11/2020	377846	117
25/11/2020	377950	104
27/11/2020	377959	9
30/11/2020	378048	89
02/12/2020	378147	99
03/12/2020	378153	6
04/12/2020	378290	137
07/12/2020	378350	60
10/12/2020	378408	58
11/12/2020	378520	112
15/12/2020	378642	122
18/12/2020	378727	85
21/12/2020	378830	103

23/12/2020	378847	17
24/12/2020	378899	52
28/12/2020	379165	266
30/12/2020	379165	0
31/12/2020	379175	10

Leachate head within Lamby Way 2019

Dip date	Leachate Level
07/01/2020	2.15
09/01/2020	2.1
15/01/2020	2.13
30/01/2020	2.15
05/02/2020	2.1
14/02/2020	2.02
27/02/2020	1.86
06/03/2020	1.76
13/03/2020	1.78
20/03/2020	1.79
27/03/2020	1.82
02/04/2020	1.76
09/04/2020	1.72
16/04/2020	1.65
23/04/2020	1.7
30/04/2020	1.76
08/05/2020	1.8
15/05/2020	1.81
22/05/2020	1.79
29/05/2020	1.74
05/06/2020	1.79
11/06/2020	1.8
19/06/2020	1.82
26/06/2020	1.84
02/07/2020	1.83
10/07/2020	1.87
17/07/2020	1.86
24/07/2020	1.84
07/08/2020	1.81
13/08/2020	1.86
20/08/2020	1.91
28/08/2020	1.94
07/09/2020	1.86
11/09/2020	1.9
18/09/2020	1.91
01/10/2020	1.95
02/11/2020	1.84
07/12/2020	1.89
20/12/2020	1.92



Weather conditions at Lamby Way 2020

The annual rainfall for Lamby Way is shown below in mm

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
82	169	57	37	10	98	69	125	54	163	67	159	1095