

Lamby Way annual report January 2021 – December 2021

**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

2021 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 2021:

1. Ongoing maintenance of all perimeter gas sampling points. Replacement of sample valves and wells ends as required, and continued vegetation clearance.
2. Introduction of grounds maintenance programme, additional clearance around sampling points to ensure safe access.
3. LTP maintenance previously reported, site access had been problematic during Covid lockdowns, these issues have been resolved and maintenance being undertaken by Enitial.
4. Martin Williams has left post with the Council, CoTC cover is being provided by Andrew Williamson, in addition Matt Long is completing CoTC awards and undertaking duties in relation to the landfill site.

(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	4,881	Cubic meters
Energy used (including for leachate treatment)		Annual	160.9	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;	10,400 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	491,997 m ³
Combustion in gas engines;	5,008,317 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

(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

(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 – 2021

Monitoring data for the Lamby Way landfill from January 2021 to December 2021 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.

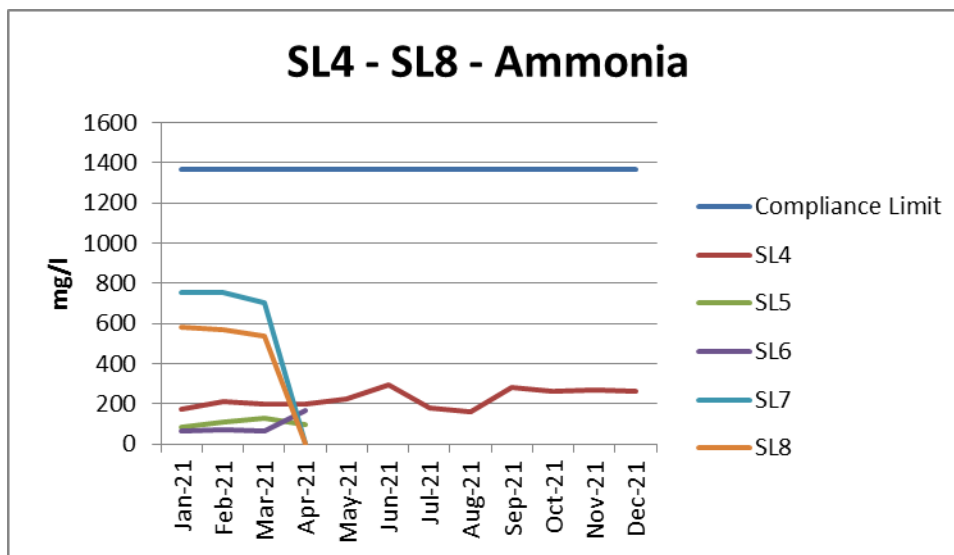
Leachate well (SL2) - Borehole is dry, no action possible. Situation will be monitored.

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

Leachate Data (SL4– SL8)

Ammoniacal Nitrogen (Ammonia)

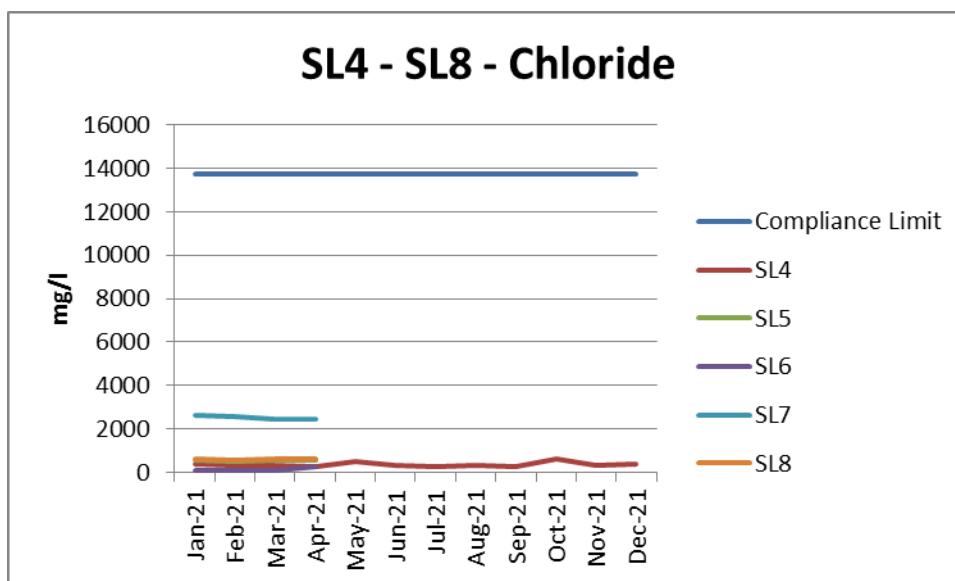
Ammoniacal nitrogen ($\text{NH}_3\text{-N}$) is a measure commonly used for testing the quantity of Ammonium ions, derived naturally via organic processes, in water or waste liquids. It is a measure used mainly for quantifying values in waste treatment and water purification systems, as well as a measure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



There were no breaches of the trigger level detected in 2021, however from the month of May only SL4 was accessible.

Chloride

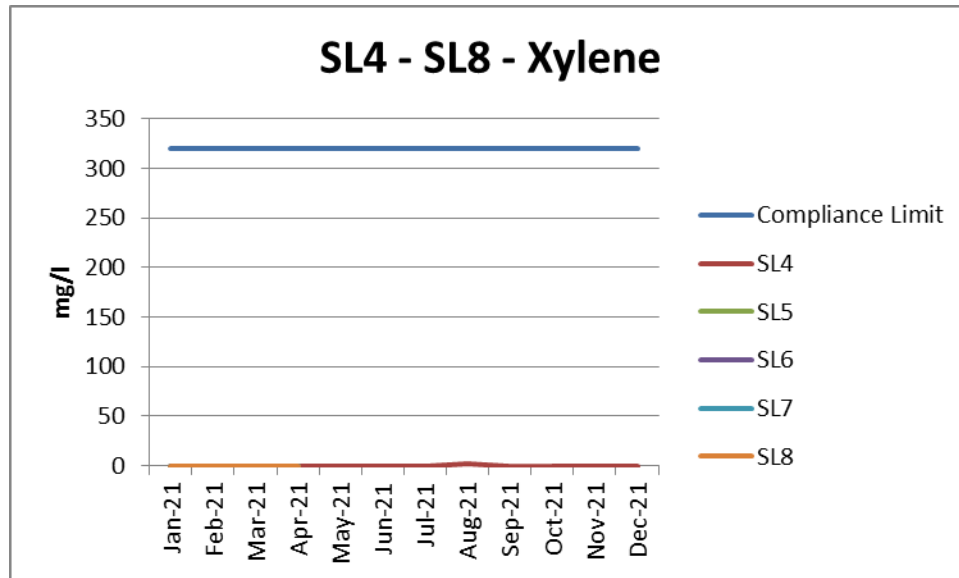
Chloride levels in a waste mass are closely linked to naturally occurring sea water. It is measured to determine if there is any ingress of sea water (or saline ground waters) into a waste mass.



There were no breaches of the trigger level detected in 2021, however from the month of May only SL4 was accessible.

Xylene

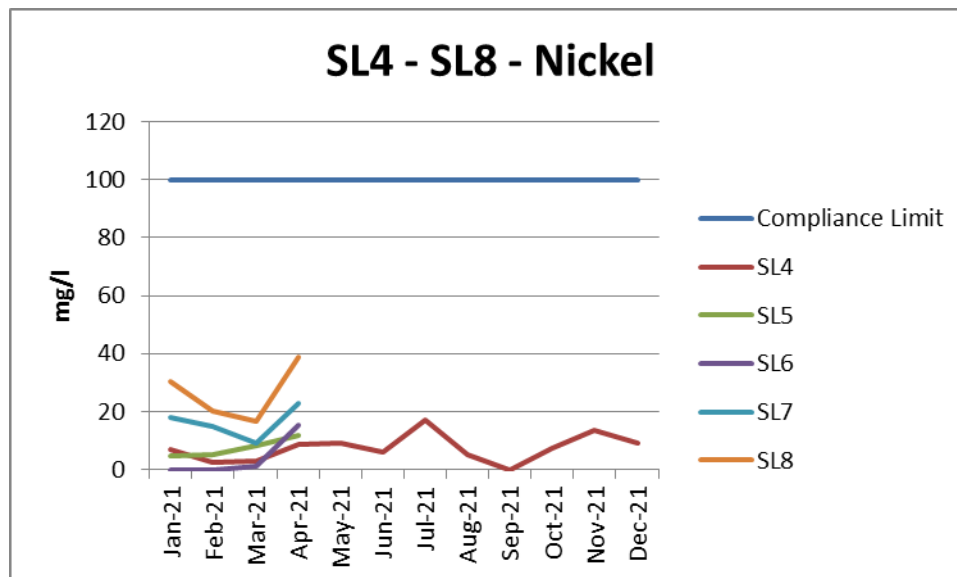
In the presence of Acidic conditions, Xylene can be the pre-cursor to more hazardous compounds of the Benzene family, especially in the presence of Chloride.



There were no breaches of the trigger level detected in 2021, however from the month of May only SL4 was accessible.

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.



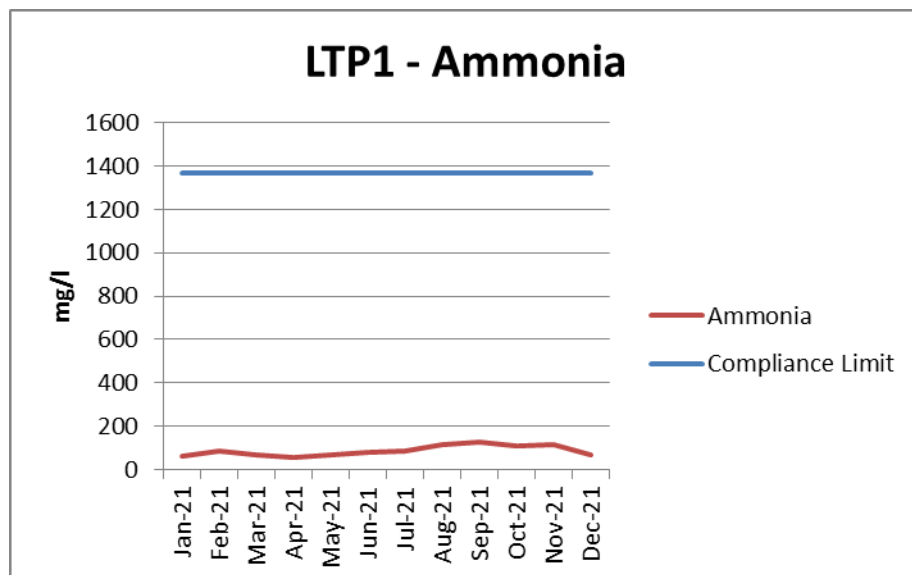
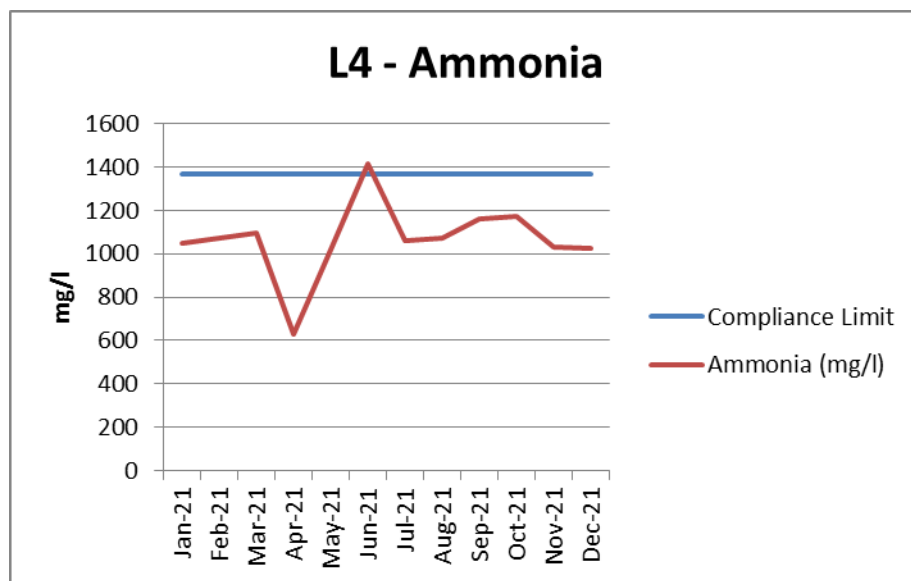
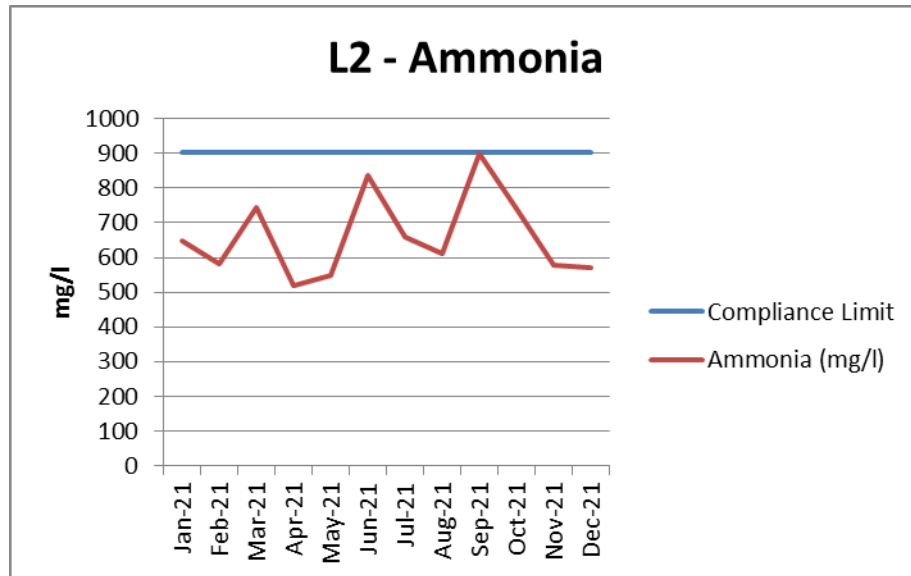
There were no breaches of the trigger level detected in 2021, however from the month of May only SL4 was accessible.

Leachate Data – (L2, L4, LTP1)

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

Ammoniacal Nitrogen (Ammonia)

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

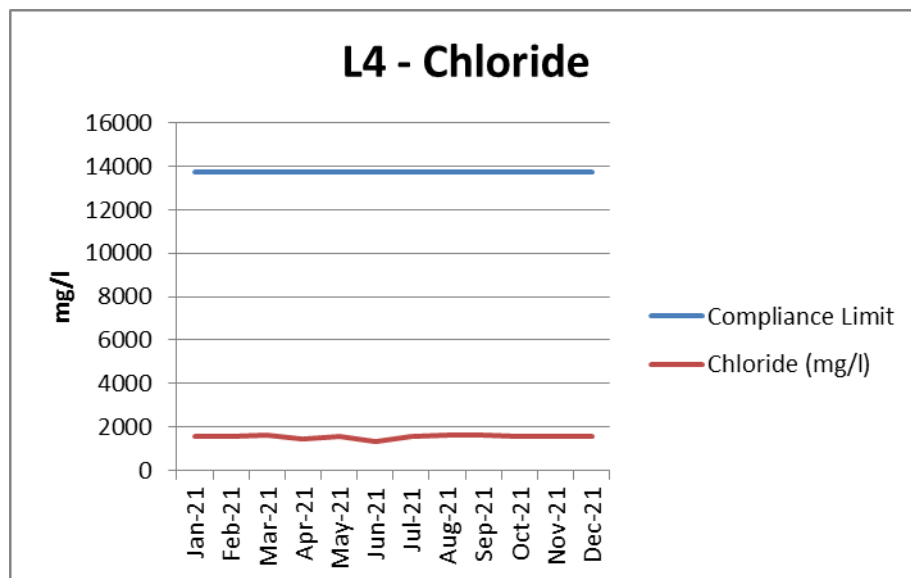
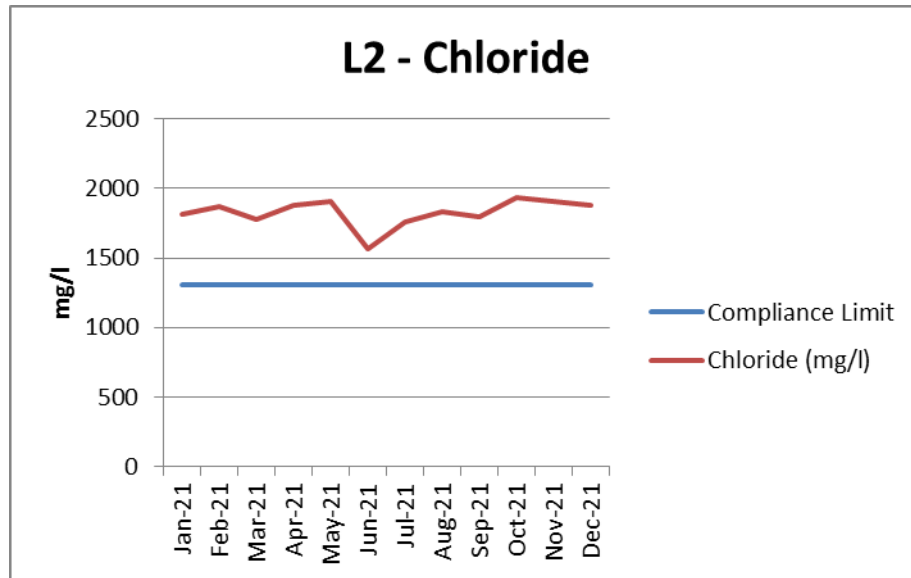


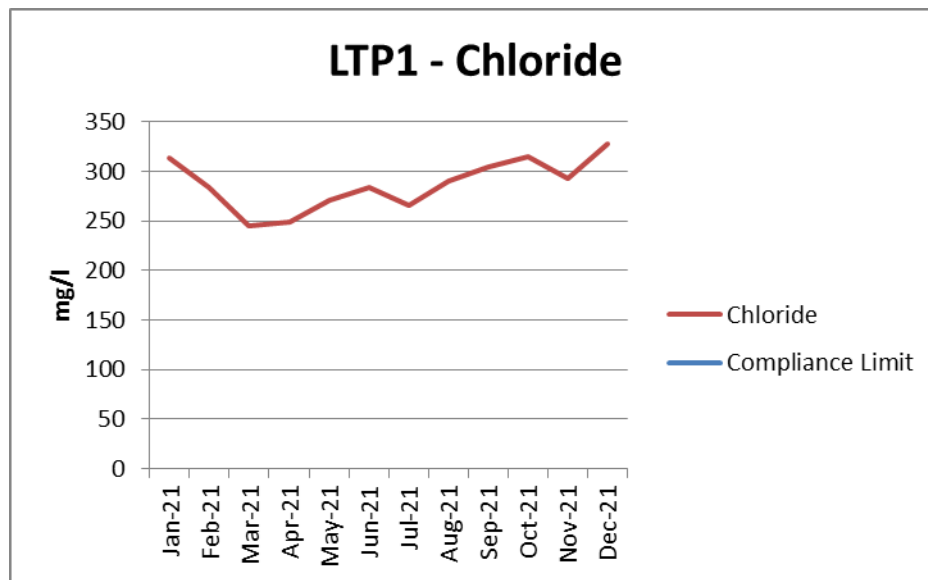
L4 had 1 breach (1413mg/l) of the 1370mg/l trigger level in June 2021.

There were no breaches from L2 and LTP1.

Chloride

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



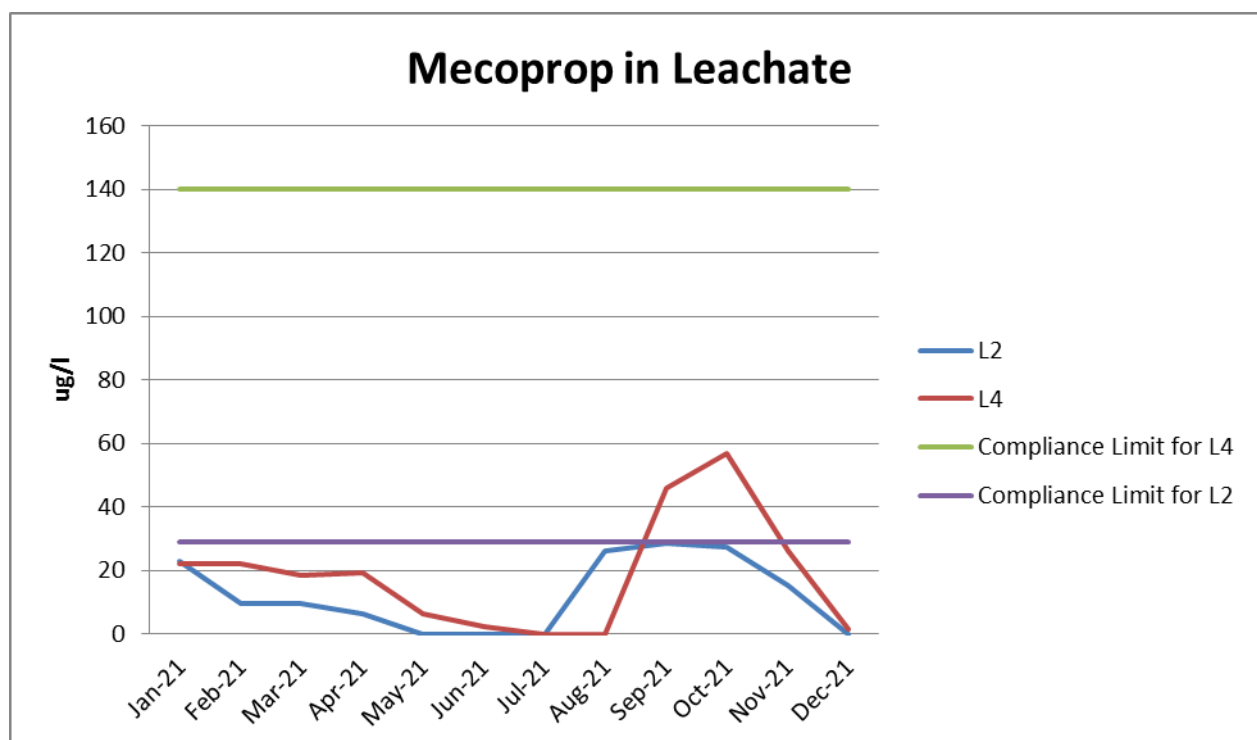


L2 had 12 breaches of the 1306mg/l trigger level, throughout the year.

There were no breaches for L4 or LTP1.

Mecoprop

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

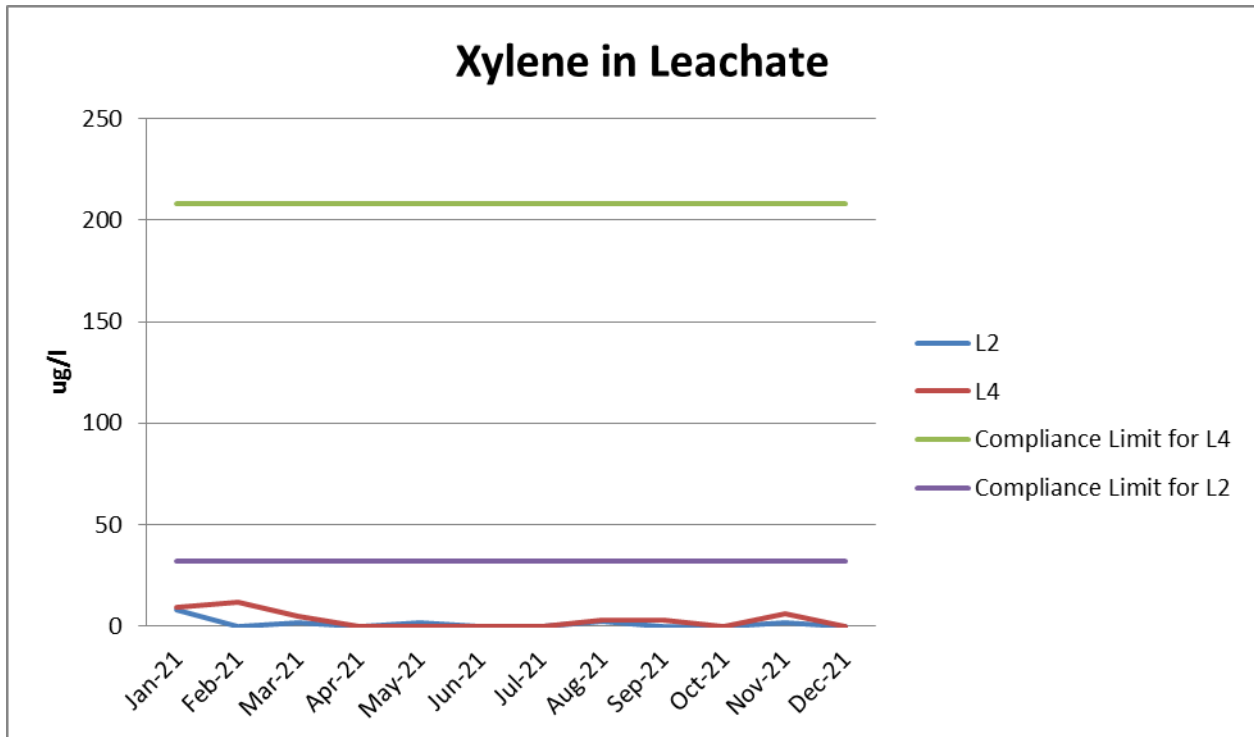


There are two trigger levels, 29ug/l for L2 and 140ug/l for L4 and LTP1.

L2 breached the trigger level once in September and October 2021. There were no breaches for L4.

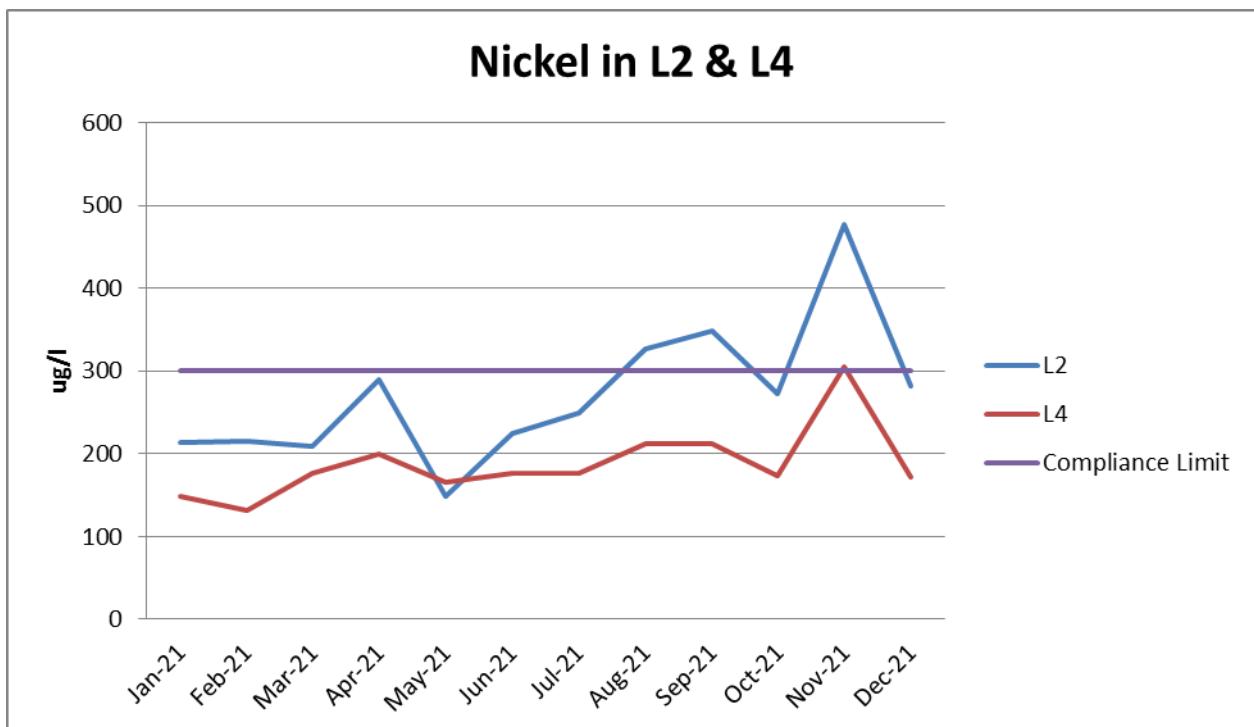
Mecoprop data from LTP1 is not reported as it is not required by the permit.

Xylene



There was no 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 three breaches for L2 in the months of August, September and November 2021.

There was one breach for L4 in the month of November 2021.

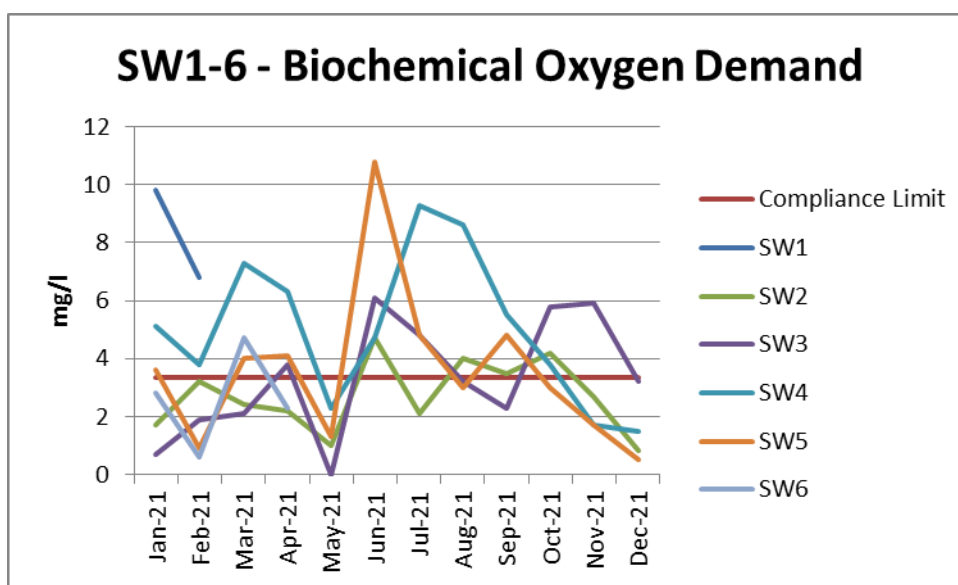
Surface Water (SW1-SW6)

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.

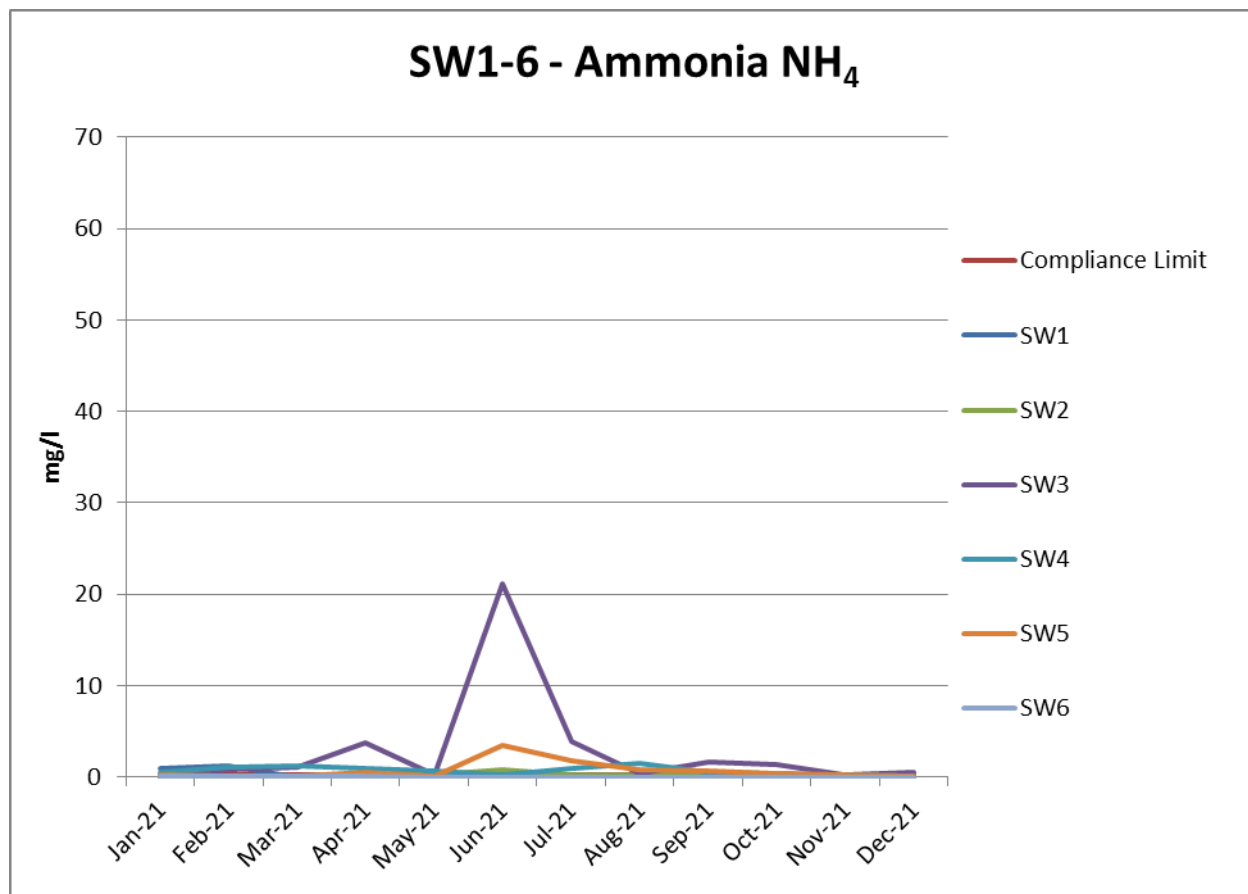


This graph shows the distribution of BOD data in surface water in 2021. In total there were 26 breaches of the 3.35mg/l limit with the following distribution.

SW1	2
SW2	4
SW3	5
SW4	8
SW5	6
SW6	1
	26

Note: SW1 could only be sampled in January and February. SW6 could only be sampled from the months of January to April, due to access restrictions.

Ammoniacal Nitrogen (Ammonia)



There were 34 breaches of the 0.17mg/l limit in 2021.

Note: SW1 could only be sampled in January and February. SW6 could only be sampled from the months of January to April, due to access restrictions.

SW1	2
SW2	4
SW3	10
SW4	11
SW5	7
SW6	0
	34

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 5 breaches of the new HRA trigger levels, with C12 breaching the trigger limit most frequently June (28.3mg/l), September (21.7mg/l), November (22.3mg/l) and December (24.7mg/l).

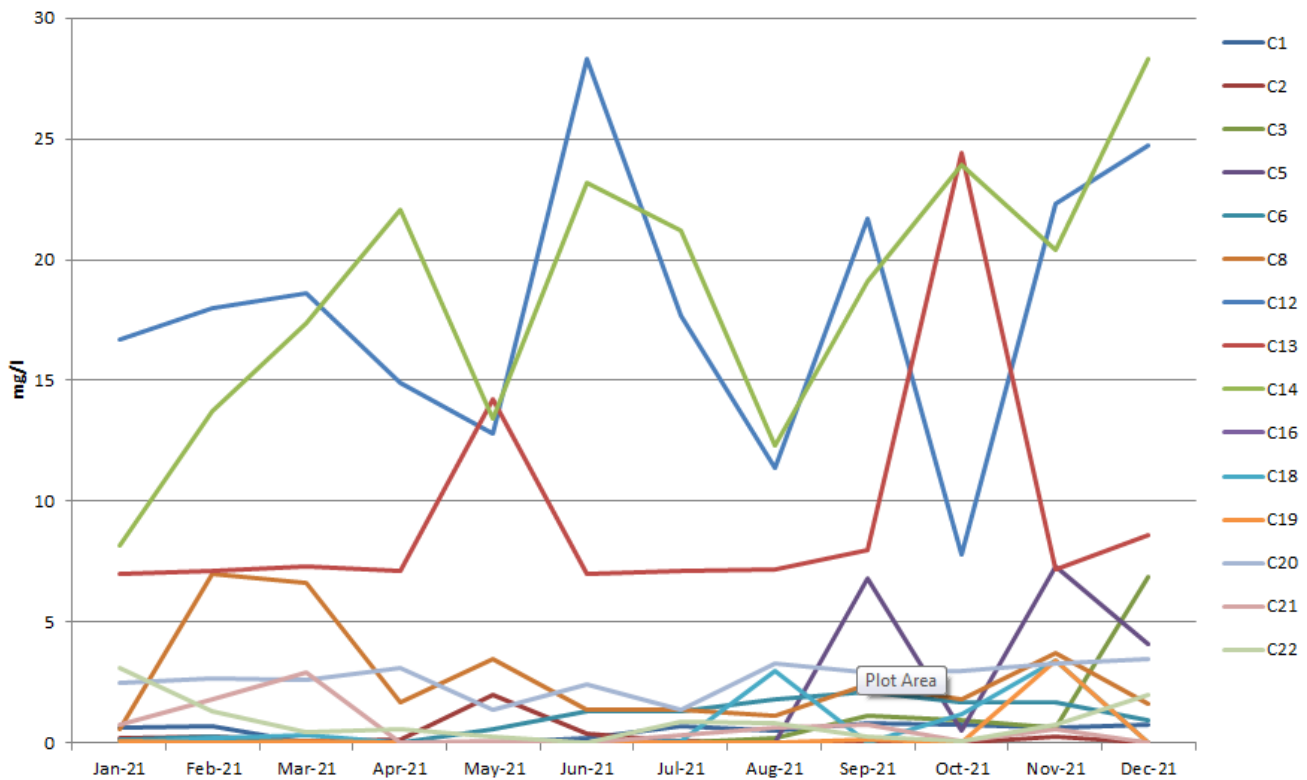
C14 only breached the trigger level once November with a value of 28.3mg/l.

C16 remains to be inaccessible.

The distribution of breaches is shown below.

C12	4
C14	1
	5

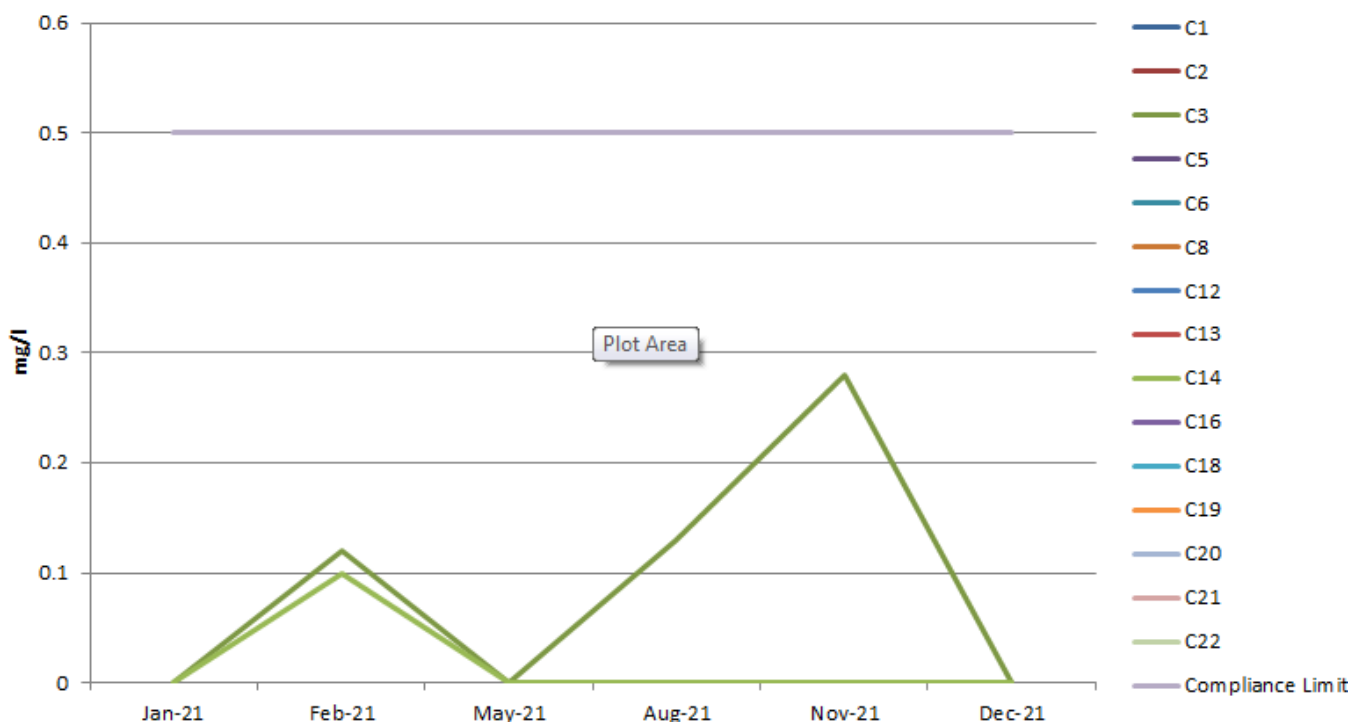
Ammonia in GW



Cadmium

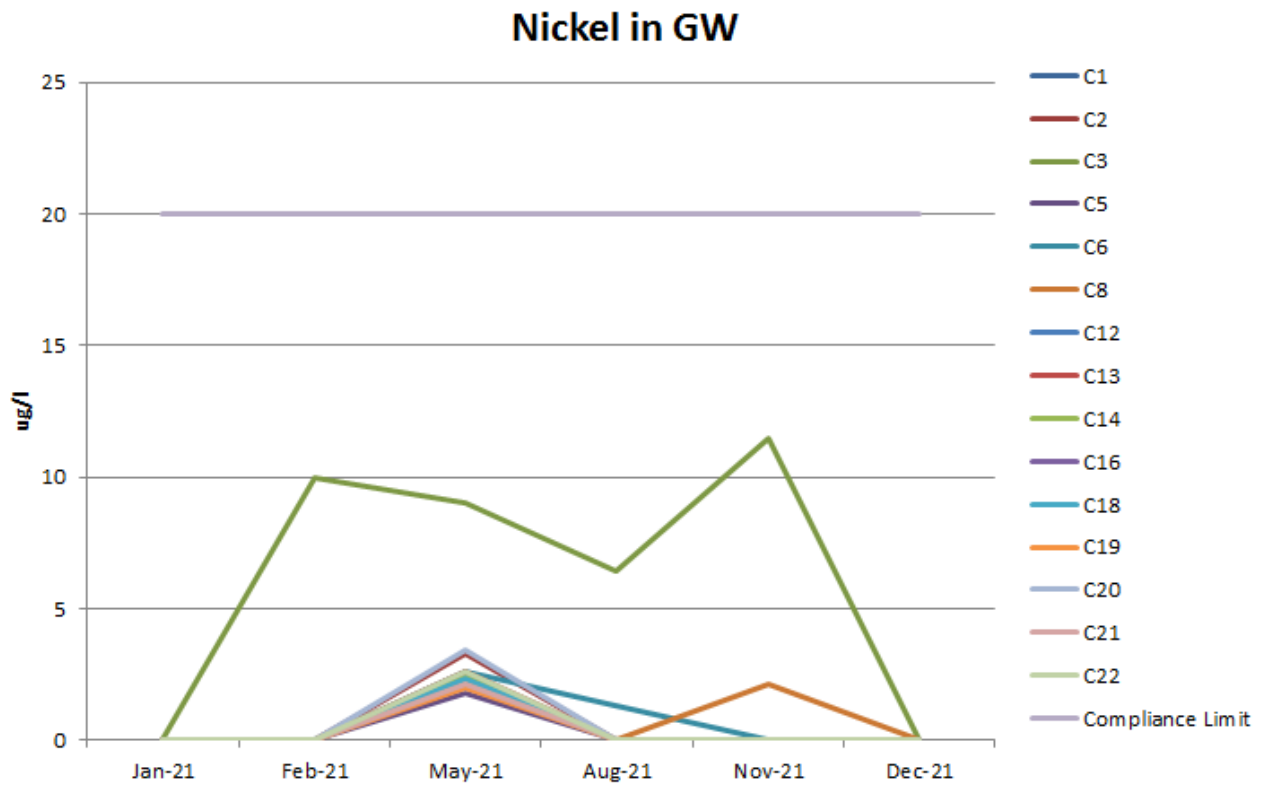
Cadmium can be found in low concentrations in rocks, coal, and petroleum and enters the ground and surface water when dissolved by acidic waters. It may enter the environment from industrial discharge, mining waste, metal plating, water pipes, batteries, paints and pigments, plastic stabilizers, and 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.

Groundwater Quarterly - Cadmium



There were no breaches of the Cadmium trigger level in 2021.

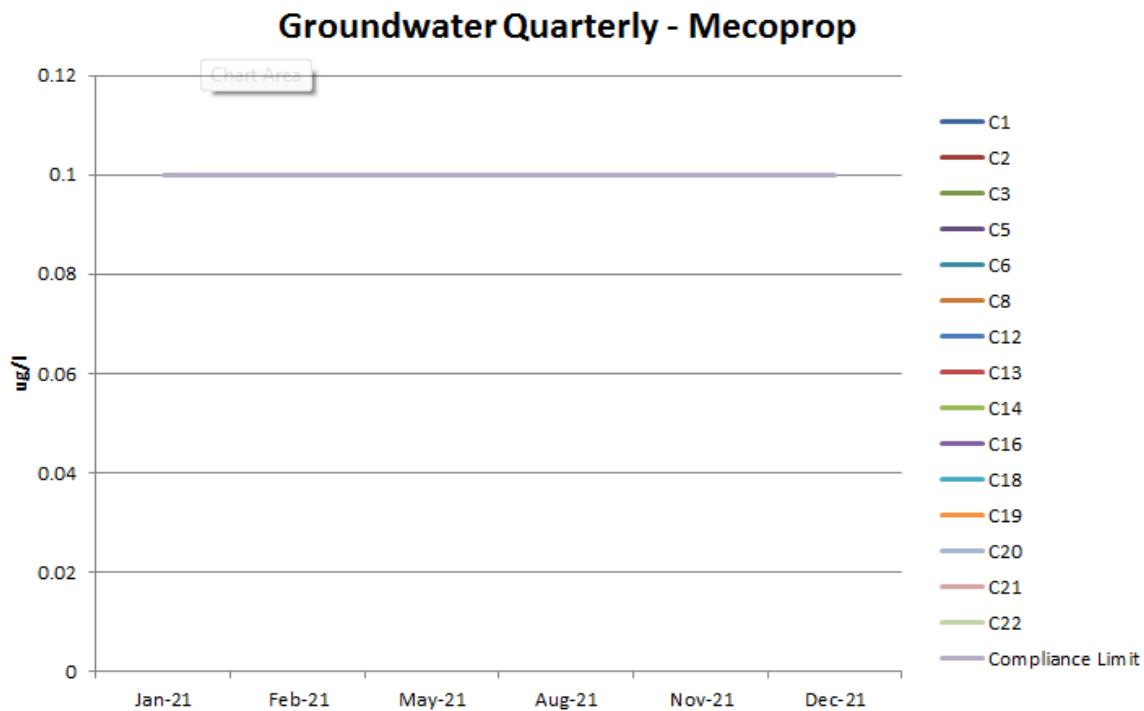
Nickel



The trigger level for Nickel is 20ug/l.

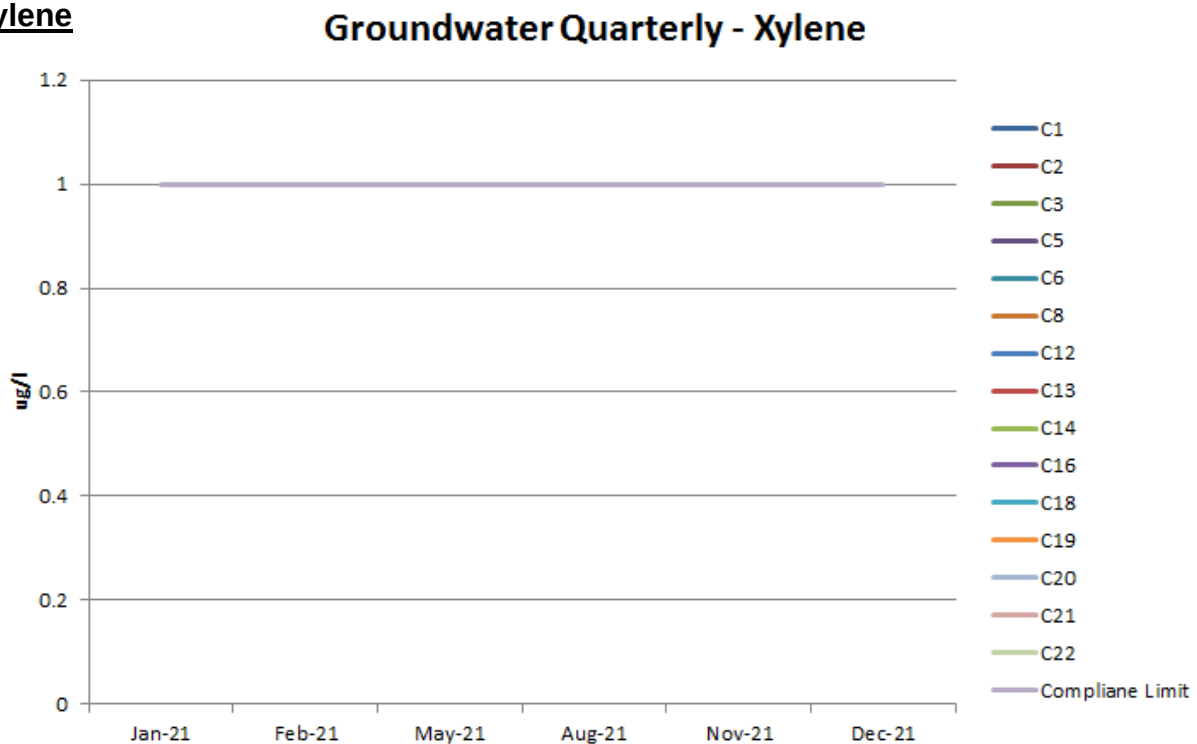
There were no breaches for Nickel in 2021.

Mecoprop



There were no breaches of the 0.1ug/l mecoprop trigger level. All results throughout the year (2021) were reported as <0.1ug/l.

Xylene

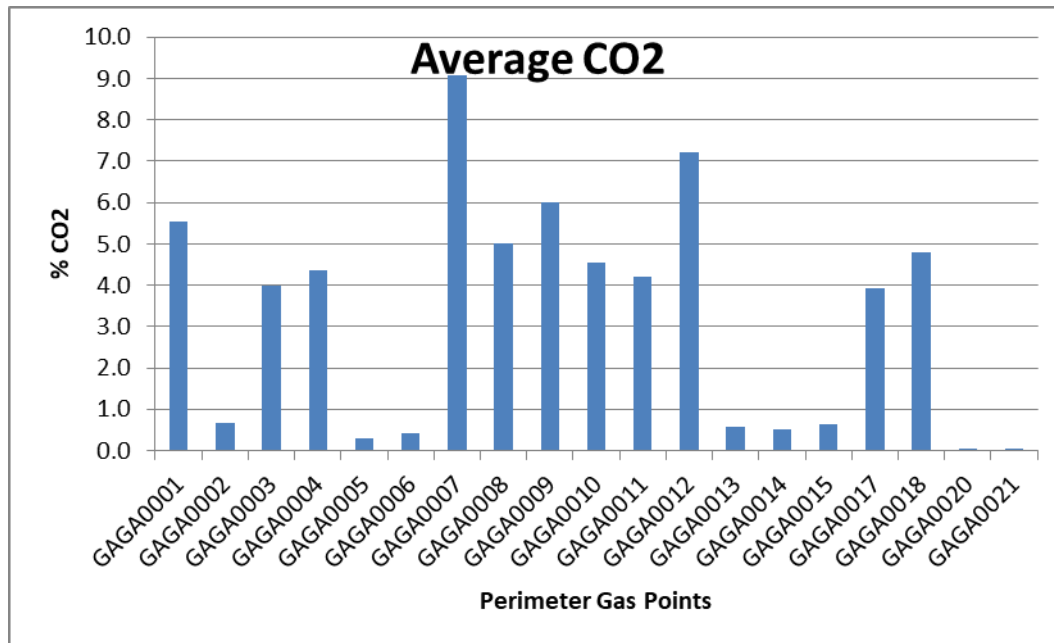


No breaches of the 1ug/l trigger level were detected in 2021. As with the mecoprop, all results were below the detection limit and were reported as <0.1ug/l.

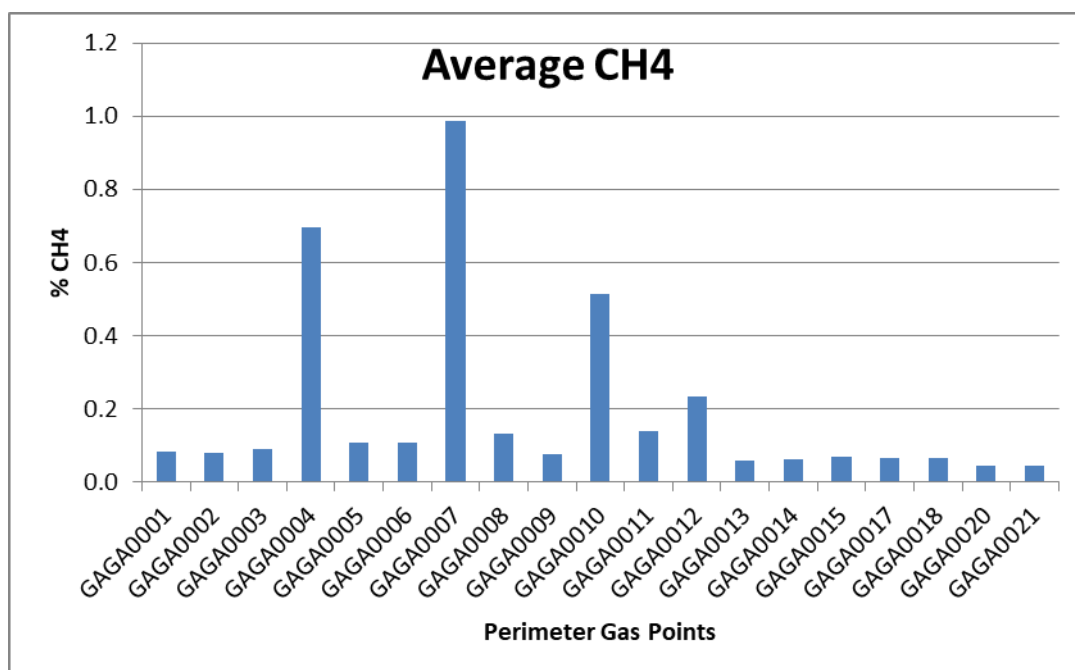
Perimeter Gas Data

The highest volumes of CO₂ are detected within G7 and G12, both located on the eastern perimeter of Lamby Way Landfill site. Points G2, G5, G6, G13, G14, G15, G20 and G21 remain on average low CO₂ concentrations, with other points having on average elevated levels.

Points G16, G19 and G22 – G23 have been lost due to damage / vegetation.



The highest volumes of CH₄ are detected within G4, G7 and G10, all are located on the eastern perimeter of Lamby Way Landfill site. All other monitoring points remain low concentrations of CH₄.



Leachate volumes

Date	Meter reading	Volumes Discharged
31/12/2020	379175	
04/01/2021	379186	11
05/01/2021	379243	57
07/01/2021	379315	72
08/01/2021	379357	42
11/01/2021	379444	87
12/01/2021	379512	68
14/01/2021	379596	84
15/01/2021	379596	0
18/01/2021	379682	86
20/01/2021	379841	159
22/01/2021	379902	61
26/01/2021	379988	86
27/01/2021	380021	33
29/01/2021	380131	110
01/02/2021	380250	119
03/02/2021	380333	83
05/02/2021	380359	26
08/02/2021	380455	96
10/02/2021	380477	22
12/02/2021	380478	1
15/02/2021	380479	1
17/02/2021	380480	1
18/02/2021	380603	123
19/02/2021	380635	32
22/02/2021	380776	141
24/02/2021	380819	43
25/02/2021	380837	18
26/02/2021	380838	1
01/03/2021	380927	89
04/03/2021	381034	107
05/03/2021	381051	17
08/03/2021	381152	101
09/03/2021	381194	42
11/03/2021	381329	135
16.03.2021	381395	66
17/03/2021	381398	3
19/03/2021	381430	32
22/03/2021	381432	2
24/03/2021	381433	1
26/03/2021	381434	1
29/03/2021	381435	1
31/03/2021	381436	1
01/04/2021	381436	0
02/04/2021	381437	1
07/04/2021	381439	2

09/04/2021	381439	0
12/04/2021	381441	2
13/04/2021	381441	0
15/04/2021	381442	1
19/04/2021	381444	2
21/04/2021	381445	1
22/04/2021	381445	0
26/04/2021	381447	2
29/04/2021	381449	2
30/04/2021	381450	1
04/05/2021	381452	2
07/05/2021	381454	2
11/05/2021	381457	3
13/05/2021	381458	1
17/05/2021	381461	3
18/05/2021	381461	0
19/05/2021	381462	1
24/05/2021	381465	3
26/05/2021	381466	1
28/05/2021	381468	2
01/06/2021	381470	2
03/06/2021	381471	1
04/06/2021	381471	0
07/06/2021	381473	2
10/06/2021	381475	2
14/06/2021	381477	2
16/06/2021	381479	2
18/06/2021	381480	1
21/06/2021	381482	2
23/06/2021	381484	2
25/06/2021	381485	1
28/06/2021	381487	2
02/07/2021	381489	2
05/07/2021	381491	2
07/07/2021	381493	2
09/07/2021	381494	1
12/07/2021	381508	14
14/07/2021	381517	9
16/07/2021	381731	214
19/07/2021	381731	0
26/07/2021	381731	0
28/07/2021	381732	1
02/08/2021	381733	1
04/08/2021	381733	0
05/08/2021	381749	16
09/08/2021	381789	40
10/08/2021	381826	37
11/08/2021	381860	34
12/08/2021	381890	30
13/08/2021	381913	23
16/08/2021	381940	27

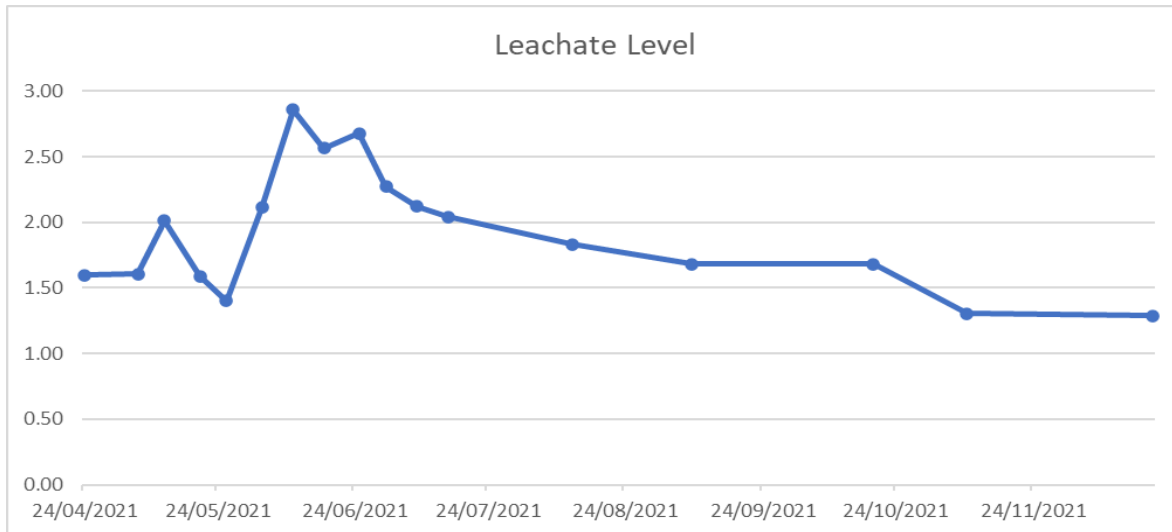
18/08/2021	382013	73
19/08/2021	382297	284
20/08/2021	382647	350
23/08/2021	383357	710
24/08/2021	383496	139
25/08/2021	383622	126
26/08/2021	383762	140
27/08/2021	383843	81
31/08/2021	384114	271
01/09/2021	384171	57
02/09/2021	384239	68
03/09/2021	384295	56
06/09/2021	384445	150
07/09/2021	384451	6
09/09/2021	384486	35
10/09/2021	384588	102
13/09/2021	384727	139
14/09/2021	384776	49
15/09/2021	384809	33
16/09/2021	384841	32
17/09/2021	384889	48
20/09/2021	384968	79
23/09/2021	385046	78
24/09/2021	385096	50
27/09/2021	385219	123
28/09/2021	385224	5
30/09/2021	385281	57
01/10/2021	385349	68
04/10/2021	385496	147
05/10/2021	385535	39
06/10/2021	385536	1
08/10/2021	385545	9
11/10/2021	385589	44
12/10/2021	385624	35
13/10/2021	385624	0
14/10/2021	385672	48
15/10/2021	385725	53
18/10/2021	385860	135
19/10/2021	385904	44
20/10/2021	385965	61
21/10/2021	386008	43
22/10/2021	386008	0
25/10/2021	386096	88
26/10/2021	386124	28
27/10/2021	386134	10
28/10/2021	386213	79
29/10/2021	386292	79
01/11/2021	386432	140
03/11/2021	386438	6
04/11/2021	386438	0
05/11/2021	386444	6

08/11/2021	386527	83
09/11/2021	386550	23
10/11/2021	386610	60
11/11/2021	386628	18
12/11/2021	386682	54
15/11/2021	386765	83
16/11/2021	386819	54
18/11/2021	386883	64
19/11/2021	386942	59
22/11/2021	387478	536
23/11/2021	387763	285
24/11/2021	387996	233
25/11/2021	388124	128
26/11/2021	388302	178
29/11/2021	388648	346
30/11/2021	388909	261
01/12/2021	388982	73
02/12/2021	388997	15
03/12/2021	389050	53
06/12/2021	389206	156
07/12/2021	389440	234
08/12/2021	389526	86
09/12/2021	389553	27
10/12/2021	389569	16
13/12/2021	389569	0
16/12/2021	389570	1
17/12/2021	389573	3
20/12/2021	389573	0
21/12/2021	389573	0
22/12/2021	389573	0
23/12/2021	389573	0
24/12/2021	389573	0
29/12/2021	389575	2
30/12/2021	389575	0
31/12/2021	389575	0

Leachate head within Lamby Way 2021

Dip date	Leachate Level
24/04/2021	1.60
06/05/2021	1.61
12/05/2021	2.01
20/05/2021	1.59
26/05/2021	1.40
03/06/2021	2.11
10/06/2021	2.86
17/06/2021	2.56

25/06/2021	2.68
01/07/2021	2.27
08/07/2021	2.12
15/07/2021	2.04
12/08/2021	1.83
08/09/2021	1.68
19/10/2021	1.68
09/11/2021	1.30
21/12/2021	1.29



Weather conditions at Lamby Way 2021

The annual rainfall for Lamby Way is shown below in mm

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
162	100	93	20	202	39	102	63	29	178	34	149	1171