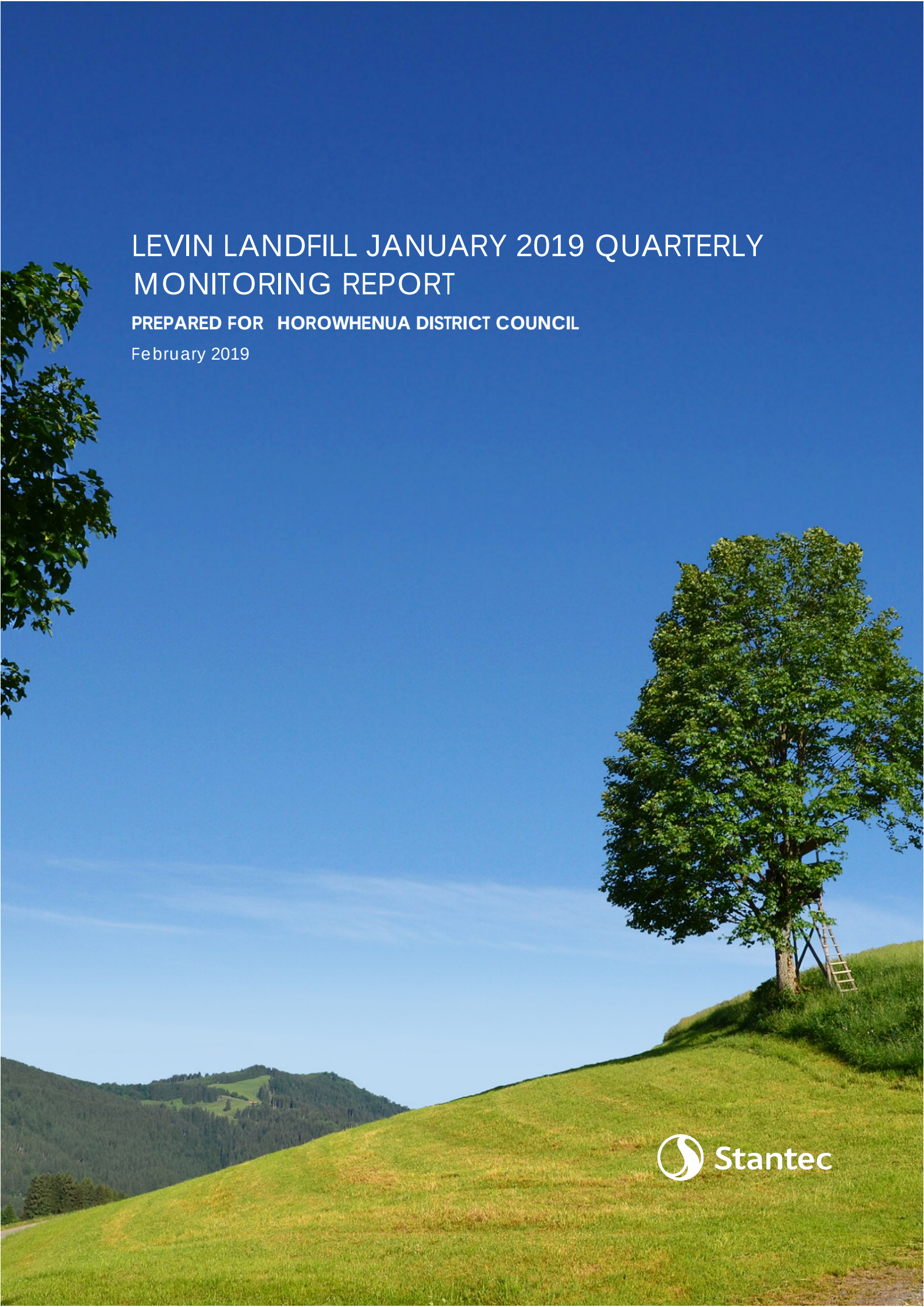
LEVIN LANDFILL JANUARY 2019 QUARTERLY MONITORING REPORT

PREPARED FOR HOROWHENUA DISTRICT COUNCIL

February 2019



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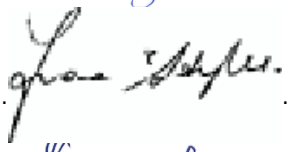
Fiona Styles (data entry)		12/03/2019
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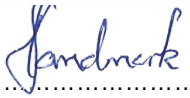
Phil Landmark		12/03/2019
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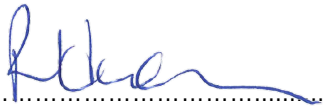
Roger Hulme		12/03/2019

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REVISION SCHEDULE

Rev No.	Date	Description	Signature or Typed Name (documentation on file)			
			Prepared by	Checked by	Reviewed by	Approved by
01	28/02/2019	Draft for Comment	Matthew Chung	Fiona Styles (data entry)	Phil Landmark	Roger Hulme
02	11/03/2019	Final	Matthew Chung	Fiona Styles (data entry)	Phil Landmark	Roger Hulme

Executive Summary

Samples from 23 groundwater bores, the leachate effluent and 7 surface water sites were collected during October 2018 from around the Levin Landfill and were analysed for parameters as set out in Discharge Permit 6010. Stantec New Zealand, on behalf of Horowhenua District Council, reviewed the results of this monitoring.

Natural Background Groundwater

- Results from the background water samples appear to be showing impact from activities unrelated to the landfill operations.
- Both background bores (G1S and G1D) showed very elevated sulphate levels which is the first time these have been measured. It is recommended that re-testing of bores G1S and G1D be carried out to confirm if the results are truly reflective of the groundwater quality at these sampling locations.

Groundwater Quality Hydraulically Down-Gradient of the New Landfill

- Water quality from shallow bores located hydraulically down-gradient of the new landfill (D-series bores) were all below the ANZECC Livestock Drinking Water Trigger Values, and therefore comply with the resource consent conditions.
- Water quality from the deep bore located hydraulically down-gradient of new landfill (E1D) was below the DWSNZ, and therefore complies with the resource consent conditions.
- Leachate indicator parameters in samples from deep bore E1D is close to background concentrations.

Impact of Old Landfill on Groundwater

- Water quality from shallow bores located hydraulically down-gradient of the old landfill (B-series and C-series bores) were all below the ANZECC Livestock Drinking Water Trigger Values, and therefore comply with the resource consent conditions.
- There was one non-compliance with respect to the resource consent condition for the deep-water quality where the manganese concentration at bore C2DD was marginally above the DWSNZ MAV. The concentration of manganese at this bore is consistent with historical results and is representative of ground water quality in the area.
- Bores located immediately down-gradient hydraulically of the old unlined landfill show elevated concentrations of leachate indicators above background concentrations.
- Selected bores located hydraulically down-gradient of the old landfill were analysed for typical SVOCs and VOCs. All parameters detected were below the DWSNZ MAVs.
- The leachate plume appears to have a confined northwards radius and is not extending to the north-west and the north-east. The estimate of plume width is 300-500m, which has been used since 2014.

Groundwater Quality Down-Gradient of the Irrigation Area

- Water quality from shallow bores located immediately down-gradient of the leachate irrigation area were below the ANZECC Livestock Drinking Water Trigger Values, and therefore comply with the resource consent conditions.

Leachate Effluent

- Results from the leachate effluent sample are within the range of data obtained from previous rounds and are well below that recorded at typical Class 1 landfills.
- An increasing trend is noted in nitrate nitrogen and conductivity levels in bores located hydraulically up- and down-gradient of the leachate pond. It is recommended that further investigations be carried out to identify the possible cause (or causes) of the elevated levels.

Tatana's Property Drain (surface water sampling locations)

- Several sampling locations along the Tatana Property Drain recorded their highest nitrite, nitrate and pH concentrations since monitoring began. Close monitoring of these parameters during the April 2019 monitoring round is recommended to confirm whether it is indicative of an increasing trend.
- The results obtained from samples where the Tatana's drain discharges into Hokio Stream did not show any impact from the discharge of the drain.
- During the January 2019 monitoring round, an elevated chloride concentration at SW1 and an elevated nitrite-N concentration at SW2 were observed. Further review of the results during the next monitoring round is recommended.

Hokio Stream (surface water sampling locations)

- During the January 2019 monitoring period, there were three exceedances from surface monitoring at the Hokio Stream (pH at HS1, faecal coliform at HS2 and HS3). Exceedances in pH and faecal coliform may be related to localised activities.
- Current observations indicate that leachate from the landfill is not having a detrimental effect on the Hokio Stream.

Horowhenua District Council

Levin Landfill January 2019 Quarterly Monitoring Report

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1. Introduction

Horowhenua District Council (HDC) commissioned Stantec New Zealand to carry out environmental reporting for the discharge consent monitoring around the Levin Landfill site. Monitoring is carried out every three months at 27 locations, as required under the resource consent conditions. There are 23 boreholes penetrating the sand and gravel aquifers, 3 surface water sampling locations and a leachate sampling point as shown in the Site Plan in Appendix A. In addition, HDC has agreed to undertake voluntary surface water monitoring at four locations along the Tatana's Property drain.

The Levin Landfill site is made up of two landfills, one old, closed and unlined landfill and the new, lined and active landfill. The new landfill footprint is being developed in stages. The latest area to be developed is Stage 3C (in 2017), though waste disposal operations are occurring across the top of most of the lined landfill footprint area, with the exception of Stage 1A.

The Levin Landfill site is located above two identified aquifers, a shallow sand aquifer and a deeper gravel aquifer. The shallow aquifer is unconfined, has a low to moderate permeability, and flows in a northerly direction. The deeper gravel aquifer is a confined to semi-confined aquifer. Horizons Regional Council hydrology staff advised that "*the general confined groundwater flow direction is towards the west*". Groundwater quality in the area is highly variable because of interaction with peat deposits that are prevalent in the area, localised effects such as from grazing activities, droppings from scavenging birds and from nitrogen-fixing plants such as gorse.

Since January 2010 water from the boreholes has been tested for dissolved nutrients and metals rather than total concentrations. For simplicity, results from monitoring prior to January 2010 (which were tested for total metal and nutrient concentrations) have not been compared to the results from January 2010 onwards.

This report presents the results from the January 2019 monitoring round which have been compared with the Drinking Water Standards for New Zealand 2008 (DWSNZ), and the Australian and New Zealand Environment and Conservation Council (ANZECC) 2000 Livestock Drinking Water Trigger Values as per Discharge Consent 6010.

Note that the resource consent is currently under review and changes have been proposed to the consent conditions that define the environmental monitoring requirements. However, the outcome of the review hearing has been appealed and so the new consent conditions have not been finalised. Until this is done, the requirements of the existing consent conditions are being complied with.

2. Groundwater and Surface Water Monitoring

2.1 Sample Analysis

Samples were collected by Downer from 9 to 16 January 2019. All samples collected were couriered overnight to Eurofins ELS Ltd in Lower Hutt, Wellington, for immediate analysis.

The sampling programme for 2017-2020 is summarised in the schedule in Appendix B. The timing of the samples is slightly different from that outlined in the Consent, but this change has been approved by Horizons Regional Council. The main difference is that annual comprehensive monitoring is now undertaken in the January sampling round rather than during the October monitoring round. Additional analysis for sodium and iron is undertaken on some groundwater samples for the monitoring requirements of the Stormwater Discharge Consent 102259.

Groundwater samples taken from the boreholes, surface water samples from Hokio Stream and the leachate effluent were analysed for the comprehensive suite of parameters which are outlined in Table 2-1. The Tatana's Property samples were analysed based on a specific parameter list agreed to by Horizons Regional Council as detailed in Section 2.8.

Table 2-1: Comprehensive Parameters

Type	Parameters
Characterising	pH Electrical Conductivity (EC) Alkalinity Total Hardness Suspended Solids
Oxygen demand	COD, BOD
Nutrients*	NO_3-N, NH_4-N, DRP, SO_4
Metals*	Al, As, Cd, Cr, Cu, Fe, Mg, Mn, Ni, Pb, Zn
Other elements	B, Ca, Cl, K, Na
Organics	Total Organic Carbon, Total Phenols, Volatile Acids
Biological	Faecal Coliforms

Note: *Analyses performed for nutrients and metals are for dissolved rather than total concentrations.

During the January 2019 comprehensive monitoring round, water samples taken from bores B1, B2, B3s, C2, C2DS, G2S were also analysed for semi-volatile organic compounds (SVOCs) and volatile organic compounds (VOCs) as per the discharge consent 6010.

2.2 Background Groundwater Quality

Water quality from the natural **background water up-gradient from the landfill site is not subjected to any consenting conditions**. However, for comparison purposes, both the ANZECC Livestock Drinking Water Trigger Values and the DWSNZ guidelines were used to benchmark the quality of water up-gradient from the landfill site.

Groundwater is collected from two background bores situated hydraulically up-gradient from both the new and old landfills to the southeast of the site (bores G1S and G1D, Site Plan, Appendix A). These two bores were constructed in late 2009 to sample background water quality from the two main hydrogeological units. The first sampling round from these two bores was in January 2010.

The results are presented in Table 2-2. Bore F3 is also included in the background table as it is near the south boundary of the landfill site but further west and is unlikely to be impacted by landfill activities. The full laboratory report is presented in Appendix C.

Table 2-2: Background Monitoring Results for January 2019

Determinant	Units	DWSNZ MAV	ANZECC STOCK	G1S	G1D	F3
Water level	m			14.31	14.89	5.31
pH		7 to 8.5*	6 to 9	**6.3**	7.4	7.2
Suspended Solids	mg/l			*3*	*3*	6
Phenol	mg/L			*0.005*	*0.005*	*0.005*
VFA	mg/L			*2.5*	6	6
TOC	mg/L			10.2	2.1	1.4
Alkalinity	mg CaCO3/L			24	60	45
Conductivity	mS/m			181	29.1	20.2
COD	mg/L			93	*7.5*	*7.5*
BOD5-Total	mg/L			*3*	*3*	*0.5*
Faecal coliforms	col/100ml	NIL	100	*2*	*2*	*2*
Chloride	mg/L	250*		**513**	33.1	21.3
Nitrate-N	mg/L	11.3	90.3	1.27	0.11	0.74

Determinant	Units	DWSNZ MAV	ANZECC STOCK	G1S	G1D	F3
Sulphate	mg/L	250*	1000	**1920**	**1790**	10.7
Ammonia-N	mg/L	1.17		0.05	0.07	*0.005*
Hardness	mg CaCO3/L	200*		**373**	53	38
Calcium	mg/L		1000	73.9	8.72	5.92
Magnesium	mg/L			45.7	7.57	5.70
Potassium	mg/L			13.2	5.77	4.95
Sodium	mg/L	200*		156	34.1	24.1
D.R. Phosphorus	mg/L			0.043	0.314	0.131
Aluminium	mg/L	0.1*	5	0.013	0.020	*0.001*
Arsenic	mg/L	0.01	0.1	0.001	0.003	0.002
Boron	mg/L	1.4	5	*0.015*	0.04	*0.015*
Cadmium	mg/L	0.004	0.01	0.0002	0.0002	*0.0001*
Chromium	mg/L	0.05	1	*0.0005*	*0.0005*	*0.0005*
Copper	mg/L	2	0.4#	0.0018	0.0006	0.0006
Iron	mg/L	0.2*		**19.3**	**2.43**	*0.0025*
Lead	mg/L	0.01	0.1	*0.00025*	*0.00025*	*0.00025*
Manganese	mg/L	0.4		**0.415**	0.0654	*0.00025*
Nickel	mg/L	0.08	1	0.0012	*0.00025*	*0.00025*
Zinc	mg/L	1.5*	20	0.004	0.003	*0.001*

Note: * denotes guideline values for aesthetic determinants (G.V.), # copper trigger values range from 0.4 mg/L for sheep, up to 5 mg/L for poultry. **Bold** – denotes an exceedance of the relevant DWSNZ (2008) standard. Underlined – denotes an exceedance of the ANZECC Livestock Drinking Water Trigger Values. All `<' values have been reported as half the detection limit for statistical purposes and are expressed in italics. Cells coloured beige indicates highest level recorded since monitoring began.

The result in Table 2-2 indicates that all background bores (G1S, G1D and F3) are all within the ANZECC guidelines except for sulphate where its concentrations at G1S and G1D are at the highest levels since monitoring began in 2010. Chloride, hardness, magnesium and D.R. phosphorus concentrations at bore G1S were also at their highest levels since monitoring began. Further discussion is provided in Section 3 of this report.

There were some exceedances of the DWSNZ limits during the January 2019 monitoring round:

- pH value from bore G1S was below the DWSNZ GV
- Chloride concentration in bore G1S was above the DWSNZ MAV
- Sulphate concentration in bores G1S and G1D were above the DWSNZ MAV
- Hardness concentration in bore G1S was above the DWSNZ GV
- Iron concentration in bores G1S and G1D were above the DWSNZ GV
- Manganese concentration in bore G1S was above the DWSNZ MAV.

2.3 Groundwater Quality Hydraulically Down-Gradient of the New Landfill

Monitoring is carried out within the two main hydrogeological units for bores hydraulically up-gradient of the old landfill and hydraulically down-gradient of the new landfill.

2.3.1 Shallow Aquifer

Bores D1, D2, D3(r), D4, D5, D6 and E1S (Refer to Site Plan, Appendix A) are located hydraulically up-gradient from the old landfill. Bores D1, D2, D3(r) and D6 are located hydraulically up-gradient of the old landfill but down-gradient of the new one. This means they are uninfluenced by potential leaching from the old landfill and can act as a warning system for any leaching from the new landfill. Borehole D4 is likely to show any leaching from the new landfill, while borehole D5 is unlikely to be influenced by either landfill. It is unlikely that leachate from the new landfill will significantly affect groundwater quality due to a leachate collection system which is in place in the new landfill, but these bores would give early warning of potential problems. Bore D5 is at the south western corner of the site so also indicates shallow background groundwater quality in that part of the site.

The results from the January 2019 monitoring round for these bores are presented in Table 2-3 along with the shallow background bore results (G1S). The results have been compared with the ANZECC Livestock Drinking Water Trigger Values as per the consent conditions. The full laboratory report is included in Appendix C.

There were no exceedances of the ANZECC Livestock Drinking Water Trigger Values during the January 2019 monitoring round and so the **results comply with the resource consent conditions**.

Alkalinity concentration in bore D1 was at the highest level since monitoring began. Further discussion is provided in Section 3 of this report.

Table 2-3: D-Series and E1S Monitoring Bores for January 2019

Determinant	Units	ANZECC STOCK	D1	D2	D3(r)	D4	D5	D6	E1S	G1S
Water level	m		16.77	21.37	4.745	8.115	9.79	16.36	11.35	14.31
pH		6 to 9	6.8	6.4	6.8	7.0	7.4	6.8	7.3	6.3
Suspended Solids	mg/l		*3*	7	8	*3*	*3*	*3*	*3*	*3*
Phenol	mg/L		*0.025*	*0.025*	*0.025*	*0.025*	*0.005*	*0.025*	*0.025*	*0.005*
VFA	mg/L		*6.0*	6	6	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
TOC	mg/L		1.4	13.7	2.6	1.9	2.1	1.0	3.7	10.2
Alkalinity	mg CaCO3/L		151	101	57	52	67	73	58	24
Conductivity	mS/m		58.2	35.4	22.1	29.7	31.8	44.5	26.4	181
COD	mg/L		*7.5*	37	*7.5*	*7.5*	*21.0*	*7.5*	*7.5*	93
BOD5-Total	mg/L		*1.5*	*3*	*1.5*	*1.5*	*0.5*	*1.5*	*1.5*	*3*
Faecal coliforms	col/100ml	100	*2*	8	*2*	*2*	*2*	*2*	*2*	*2*
Chloride	mg/L		36.9	41.3	22.4	44.6	31.5	26.2	33.6	513
Nitrate-N	mg/L	90.3	16.7	*0.005*	0.20	*0.005*	0.86	22.9	0.01	1.27
Sulphate	mg/L	1000	6.44	1.58	7.68	14.9	28.30	4.85	11.4	**1920**
Ammonia-N	mg/L		*0.005*	0.45	0.17	0.22	0.01	*0.005*	0.16	0.05
Hardness	mg CaCO3/L		153	89	36	54	72	101	52	373
Calcium	mg/L	1000	29.1	15.2	6.99	9.61	12.7	18.5	9.19	73.9
Magnesium	mg/L		19.5	12.3	4.49	7.17	9.72	13.2	7.14	45.7
Potassium	mg/L		10.2	6.69	5.30	6.06	7.36	8.67	6.01	13.2
Sodium	mg/L		54.2	29.3	25.9	32.8	33.1	38.4	29.3	156
D.R. Phosphorus	mg/L		0.084	0.032	0.013	0.023	0.084	0.094	0.065	0.043
Aluminium	mg/L	5	*0.001*	0.012	*0.001*	*0.001*	*0.001*	*0.001*	0.006	0.013
Arsenic	mg/L	0.1	0.001	*0.0005*	0.007	0.003	0.001	0.001	0.002	0.001
Boron	mg/L	5	0.05	0.03	0.03	*0.015*	*0.015*	0.07	*0.015*	*0.015*
Cadmium	mg/L	0.01	0.0002	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	0.0002
Chromium	mg/L	1	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.005*	*0.0005*	*0.0005*
Copper	mg/L	0.4#	*0.00025*	*0.00025*	*0.00025*	*0.00025*	0.0005	*0.00025*	*0.00025*	0.0018

Determinant	Units	ANZECC STOCK	D1	D2	D3(r)	D4	D5	D6	E1S	G1S
Iron	mg/L		0.015	8.22	2.47	0.83	0.113	*0.0025*	4.22	19.3
Lead	mg/L	0.1	*0.00025*	0.0006	*0.00025*	*0.00025*	*0.00025*	*0.00025*	0.0006	*0.00025*
Manganese	mg/L		*0.00025*	0.300	0.189	0.175	0.0203	*0.00025*	0.219	0.415
Nickel	mg/L	1	*0.00025*	*0.00025*	*0.00025*	*0.00025*	*0.00025*	*0.00025*	*0.00025*	0.0012
Zinc	mg/L	20	*0.001*	0.007	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	0.004

Note: # copper trigger values range from 0.4 mg/L for sheep, up to 5 mg/L for poultry. **Bold** – denotes an exceedance of the ANZECC Livestock Drinking Water Trigger Values. All `<' values have been reported as half the detection limit for statistical purposes and are expressed in italics. Cells coloured beige indicates highest level recorded since monitoring began.

2.3.2 Deep Aquifer

Bores E1D, C2DD, E2D and G1D all penetrate the deeper gravel aquifer. Boreholes E2D and C2DD are located to the north-northwest of both the landfills. Borehole E1D is located to the southwest of the old landfill. Borehole G1D is located hydraulically up-gradient from both landfills and is assumed to represent background water quality. Deep groundwater flow is assumed to be towards the west and therefore E1D should also not be affected by leachate from the old landfill (refer to Site Plan, Appendix A).

Results for the January 2019 consent monitoring round are presented in Table 2-4. The results have been compared with the DWSNZ as per the discharge consent 6010. The full laboratory report is included in Appendix C.

Table 2-4: Monitoring Bores within the Deep Aquifer for January 2019

Determinant	Units	DWSNZ MAV	E1D	C2DD	E2D	G1D
Water level	m		11.27	2.51	5.69	14.89
pH		7 to 8.5*	7.5	7.4	7.7	7.4
Suspended Solids	mg/l		27	*3*	11	*3*
Phenol	mg/L		*0.025*	*0.025*	*0.025*	*0.005*
VFA	mg/L		*2.5*	*2.5*	*2.5*	6
TOC	mg/L		3.2	4.0	2.1	2.1
Alkalinity	mg CaCO3/L		161	192	82	60
Conductivity	mS/m		45.6	51.0	36.7	29.1
COD	mg/L		37	*7.5*	30	*7.5*
BOD5-Total	mg/L		*0.5*	*0.5*	*0.5*	*3*
Faecal coliforms	col/100ml	NIL	*2*	*2*	*2*	*2*
Chloride	mg/L	250*	39.0	37.7	50.5	33.1
Nitrate-N	mg/L	11.3	*0.005*	*0.005*	*0.005*	0.11
Sulphate	mg/L	250*	*0.01*	0.02	10.7	**1790**
Ammonia-N	mg/L	1.17	0.20	0.32	0.34	0.07
Hardness	mg CaCO3/L	200*	141	163	101	53
Calcium	mg/L		34.7	42.4	29.7	8.72
Magnesium	mg/L		13.1	13.7	6.46	7.57
Potassium	mg/L		4.96	6.33	5.11	5.77
Sodium	mg/L	200*	39.6	40.8	31.0	34.1
D.R. Phosphorus	mg/L		0.395	0.671	0.218	0.314
Aluminium	mg/L	0.1*	0.003	*0.001*	0.003	0.020
Arsenic	mg/L	0.01	0.008	0.003	*0.0005*	0.003
Boron	mg/L	1.4	0.05	0.06	*0.015*	0.04
Cadmium	mg/L	0.004	*0.0001*	*0.0001*	*0.0001*	0.0002
Chromium	mg/L	0.05	*0.0005*	*0.0005*	*0.0005*	*0.0005*
Copper	mg/L	2	*0.00025*	*0.00025*	*0.00025*	0.0006
Iron	mg/L	0.2*	0.036	0.017	0.064	**2.43**
Lead	mg/L	0.01	*0.00025*	*0.00025*	*0.00025*	*0.00025*
Manganese	mg/L	0.4	0.229	**0.555**	0.231	0.0654
Nickel	mg/L	0.08	*0.00025*	*0.00025*	*0.00025*	*0.00025*
Zinc	mg/L	1.5*	*0.001*	*0.001*	*0.001*	0.003

Note: * denotes guideline values for aesthetic determinants (G.V.). **Bold** – denotes an exceedance of the relevant DWSNZ (2008) standard. All `<' values have been reported as half the detection limit for statistical purposes and are expressed in italics.

There was **one exceedance of the resource consent conditions** in samples from the deep gravel aquifer during the January 2019 sampling round:

- Manganese concentration in bore C2DD exceeded the DWSNZ MAV.

2.4 Impact of Old Unlined Landfill on Groundwater Quality

Water sampling is carried out to characterise the groundwater quality in a series of shallow bores situated hydraulically down-gradient from the old unlined landfill. The series B boreholes are located within 50m of the old landfill in a line along its northern edge. The series C boreholes are located further down the hydraulic gradient from the old landfill towards Hokio Beach Road to detect whether leachate is moving off site. Borehole E2S is located northwest of the old landfill to detect any leachate moving directly towards the nearest house down-stream of the site. Bore G2S was installed in late 2009 and is located to the north of the landfill site, hydraulically down-gradient of the old landfill by Hokio Road and the entrance road to the landfill (See Site Plan, Appendix A).

The results from the January 2019 consent monitoring round for these bores are presented in Table 2-5 and have been compared with the ANZECC Livestock Drinking Water Trigger Values as per the discharge consent 6010. The full laboratory report is included in Appendix C.

There were no exceedances of the ANZECC Livestock Drinking Water Trigger Values during the January 2019 monitoring round and so the **results comply with the resource consent conditions**.

Table 2-5: Results from Shallow Boreholes Down-Gradient from the Old Landfill for January 2019

Determinant	Units	ANZECC STOCK	E2S	B1	B2	B3	C1	C2	C2DS	G2S
Water level	m		4.77	1.15	1.46	0.2	0.24	0.385	2.26	2.25
pH		6 to 9	7.4	7.2	6.9	6.9	6.9	7.0	6.8	6.9
Suspended Solids	mg/l		*3*	*3*	*3*	84	62	14	56	*3*
Phenol	mg/L		*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.005*
VFA	mg/L		6	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
TOC	mg/L		3.1	14.7	26.4	67.4	14.6	48.3	30.8	12.9
Alkalinity	mg CaCO3/L		150	309	466	1280	222	939	758	418
Conductivity	mS/m		44.5	156	152	318	99	320	173	200
COD	mg/L		*7.5*	92	36	199	36	244	77	148
BOD5-Total	mg/L		*1.5*	*1.5*	*1.5*	*3*	*3*	*3*	*3*	*3*
Faecal coliforms	col/100ml	100	*2*	*2*	*2*	*2*	16	*2*	*2*	*2*
Chloride	mg/L		42.1	269	101	219	156	377	109	376
Nitrate-N	mg/L	90.3	*0.005*	3.16	16.9	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Sulphate	mg/L	1000	7.54	47.0	45.7	0.33	19.4	25.5	0.03	2.79
Ammonia-N	mg/L		0.25	11.1	43.6	179	1.10	157	1.57	0.01
Hardness	mg CaCO3/L		120	379	235	475	196	293	606	415
Calcium	mg/L	1000	26.5	66.7	50.1	98.6	36.4	61.4	144	91.6
Magnesium	mg/L		12.9	50.9	25.6	55.2	25.5	32.4	59.9	45.1
Potassium	mg/L		5.93	18.2	47.4	104	11.4	85.3	15.6	35.0
Sodium	mg/L		44.1	124	130	155	116	295	113	250
D.R. Phosphorus	mg/L		0.576	0.099	0.035	0.044	0.020	0.021	0.029	0.013
Aluminium	mg/L	5	0.003	0.002	0.014	0.004	0.014	0.011	*0.001*	0.003
Arsenic	mg/L	0.1	0.002	*0.0005*	0.003	0.026	*0.0005*	0.001	0.002	*0.0005*
Boron	mg/L	5	0.05	0.49	1.07	1.31	0.57	2.06	0.86	0.95
Cadmium	mg/L	0.01	*0.0001*	0.0004	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*
Chromium	mg/L	1	*0.0005*	*0.0005*	*0.0005*	0.005	*0.0005*	0.002	*0.0005*	*0.0005*
Copper	mg/L	0.4[#]	*0.00025*	0.0055	0.0026	0.0017	0.0005	*0.00025*	*0.00025*	0.0046

Determinant	Units	ANZECC STOCK	E2S	B1	B2	B3	C1	C2	C2DS	G2S
Iron	mg/L		0.070	0.017	1.06	0.857	2.14	1.48	19.1	0.187
Lead	mg/L	0.1	0.0015	*0.00025*	*0.00025*	*0.00025*	0.0007	*0.00025*	*0.00025*	*0.00025*
Manganese	mg/L		0.380	8.28	1.93	3.32	0.241	0.0778	2.87	0.171
Nickel	mg/L	1	*0.00025*	0.0017	0.0018	0.0126	0.0007	0.0060	0.0023	0.0039
Zinc	mg/L	20	0.011	0.003	*0.001*	*0.001*	*0.001*	0.003	*0.001*	*0.001*

Note: # copper trigger values range from 0.4 mg/L for sheep, up to 5 mg/L for poultry. **Bold** – denotes an exceedance of the ANZECC Livestock Drinking Water Trigger Values. All `<' values have been reported as half the detection limit for statistical purposes and are expressed in italics. n/a = no dipped levels recorded by sampler.

During the January 2019 comprehensive monitoring round, water samples taken from bores B1, B2, B3s, C2, C2DS, G2S were analysed for typical SVOCs (72 parameters) and VOCs (65 parameters). Table 2-6 list parameters that were detected in the samples and compared with the DWSNZ MAV as per the discharge consent 6010. All parameters detected were below the DWSNZ MAV and so the **results comply with the resource consent conditions**. The full laboratory report is included in Appendix C.

Table 2-6: SVOC/VOC Detected from Shallow Boreholes Down-Gradient from the Old Landfill for Jan 2019

Bore	Parameters	Units	DWSNZ MAV	Results
B1	Styrene	mg/L	0.03	0.0012
	Toluene	mg/L	0.8	0.0017
B2	Toluene	mg/L	0.8	0.0015
	Chlorobenzene	mg/L	0.01	0.0037
B3S	Benzene	mg/L	0.01	0.0010
	Toluene	mg/L	0.8	0.0015
	Chlorobenzene	mg/L	0.01	0.0005
C2	Benzene	mg/L	0.01	0.0011
	Toluene	mg/L	0.8	0.0016
C2DS	Toluene	mg/L	0.8	0.0016
G2S	All parameters were below detection limits			

Note: **Bold** – denotes an exceedance of the relevant DWSNZ (2008) standard.

2.5 Groundwater Quality Down-Gradient of the Irrigation Area

The F-series boreholes sample from the shallow aquifer down-gradient of the leachate irrigation area. The F1 borehole is in the area where leachate from the new landfill was irrigated during the period 2004 to October 2008. F2 and F3 boreholes are in areas previously considered for future leachate irrigation. All leachate is now pumped to the Levin Wastewater Treatment Plant. The shallow groundwater at the irrigation area was also compared to that from the background bore (G1S).

The results from the F series boreholes are presented in Table 2-7 and have been compared with the ANZECC Livestock Drinking Water Trigger Values as per the discharge consent 6010. The full laboratory report is included in Appendix C.

Table 2-7: Results from the Irrigation Area for January 2019

Determinant	Units	ANZECC STOCK	F1	F2	F3	G1S
Water level	m		8.04	2.865	5.31	14.31
pH		6 to 9	7.2	7.2	7.2	6.3
Suspended Solids	mg/l		*3*	*3*	6	*3*
Phenol	mg/L		*0.005*	*0.005*	*0.005*	*0.005*
VFA	mg/L		*2.5*	6	6	*2.5*
TOC	mg/L		5.4	1.5	1.4	10.2
Alkalinity	mg CaCO3/L		130	53	45	24
Conductivity	mS/m		48.0	22.5	20.2	181
COD	mg/L		*7.5*	*7.5*	*7.5*	93
BOD5-Total	mg/L		*0.5*	*0.5*	*0.5*	*3*
Faecal coliforms	col/100ml	100	*2*	*2*	*2*	*2*
Chloride	mg/L		57.6	24.2	21.3	513
Nitrate-N	mg/L	90.3	1.31	0.66	0.74	1.27

Determinant	Units	ANZECC STOCK	F1	F2	F3	G1S
Sulphate	mg/L	1000	4.32	9.42	10.7	**1920**
Ammonia-N	mg/L		*0.005*	*0.005*	*0.005*	0.05
Hardness	mg CaCO3/L		128	39	38	373
Calcium	mg/L	1000	19.7	6.40	5.92	73.9
Magnesium	mg/L		19.1	5.64	5.70	45.7
Potassium	mg/L		7.90	5.21	4.95	13.2
Sodium	mg/L		46.4	28.1	24.1	156
D.R. Phosphorus	mg/L		0.160	0.142	0.131	0.043
Aluminium	mg/L	5	*0.001*	*0.001*	*0.001*	0.013
Arsenic	mg/L	0.1	0.002	0.002	0.002	0.001
Boron	mg/L	5	*0.015*	0.04	*0.015*	*0.015*
Cadmium	mg/L	0.01	*0.0001*	*0.0001*	*0.0001*	0.0002
Chromium	mg/L	1	*0.0005*	*0.0005*	*0.0005*	*0.0005*
Copper	mg/L	0.4#	0.0018	0.0010	0.0006	0.0018
Iron	mg/L		*0.0025*	0.020	*0.0025*	19.3
Lead	mg/L	0.1	*0.00025*	*0.00025*	*0.00025*	*0.00025*
Manganese	mg/L		0.0029	0.0075	*0.00025*	0.415
Nickel	mg/L	1	*0.00025*	*0.00025*	*0.00025*	0.0012
Zinc	mg/L	20	*0.001*	*0.001*	*0.001*	0.004

Note: # copper trigger values range from 0.4 mg/L for sheep, up to 5 mg/L for poultry. **Bold** – denotes an exceedance of the ANZECC Livestock Drinking Water Trigger Values. All `<' values have been reported as half the detection limit for statistical purposes and are expressed in italics.

There were no exceedances of the ANZECC Livestock Drinking Water Trigger Values during the January 2019 monitoring round and so the **results comply with the resource consent conditions**.

2.6 Leachate Effluent Results

The sampling result for leachate effluent is **not subjected to any water quality consenting conditions**. However, for comparison purposes, typical leachate characteristics for landfills published by the Waste Management Institute New Zealand (*Technical Guidelines for Disposal to Land*, August 2018, WasteMINZ) have been compared against the leachate quality (Table 2-8). The full laboratory report is included in Appendix C.

Table 2-8: Results from Leachate Effluent for January 2019

Determinant	Units	Typical Leachate Characteristics*	Leachate
		(range)	Effluent
pH		5.9 - 8.5	7.6
Suspended Solids	mg/l		72
Phenol	mg/L		0.13
VFA	mg/L		15
TOC	mg/L	17.2 - 822	753
Alkalinity	mg CaCO3/L	300 – 11500*	6480
Conductivity	mS/m	264 - 27900	1530
COD	mg/L	84 - 5090	2790
BOD5-Total	mg/L	12 - 3867	137

Determinant	Units	Typical Leachate Characteristics*	Leachate
Faecal coliforms	col/100ml		100
Chloride	mg/L	100 – 5000*	1140
Nitrate-N	mg/L	0.1 - 50*	0.08
Sulphate	mg/L	1 - 780	88
Ammonia-N	mg/L	30 – 3000*	1320
Hardness	mg CaCO3/L		578
Calcium	mg/L		113
Magnesium	mg/L	50 - 1150*	71.7
Potassium	mg/L	10 - 2500*	698
Sodium	mg/L	50 - 4000*	1020
D.R. Phosphorus	mg/L		11.7
Aluminium	mg/L		0.780
Arsenic	mg/L	45 - 2584	0.504
Boron	mg/L		6.62
Cadmium	mg/L	0.5 - 140*	*0.0005*
Chromium	mg/L	0.006 – 0.191	**0.666**
Copper	mg/L	0.005 - 50.4	0.019
Iron	mg/L	1.6 – 220	6.18
Lead	mg/L	0.001 - 0.42	0.005
Manganese	mg/L	0.03 - 45*	1.47
Nickel	mg/L	20 - 2050*	0.140
Zinc	mg/L	0.009-24.2	0.148

Note: Data taken from Table 5-5, p82 for Class 1-type landfills, Technical Guidelines for Disposal to Land, WasteMINZ August 2018. *Data taken from Table 5-4, p81 of the same guideline.

The January 2019 monitoring round results for the leachate effluent were with the typical leachate composition range for Class 1 landfills published in the WasteMINZ 2018 Technical Guidelines for Disposal to Land, with the exception of chromium which is elevated compared to Class 1 landfills, but is at the high end of the range for Class 2 landfills (0.027 – 0.64 mg/l) Class 2 landfills accept predominantly Construction and Demolition (C&D) type wastes.

2.7 Hokio Stream

Stream monitoring is carried out by grab sampling at sites HS1, HS2 and HS3 (refer to Appendix A) to investigate if groundwater containing leachate is having an adverse environmental impact on the stream. Site HS1 is situated up-stream of the old landfill, HS2 is situated alongside the old landfill and HS3 is located approximately 50m down-stream of the landfill site property boundary. Comprehensive parameter analysis, as required in the monitoring schedule, is done every 6-monthly.

Results from the January 2019 sampling round are presented in Table 2-9 and have been compared with the ANZECC Livestock Drinking Water Trigger Values as per the discharge consent 6010.

Table 2-9: Hokio Stream Results for January 2019

Determinant	Units	ANZECC STOCK	HS1	HS2	HS3
pH		6 to 9	**9.1**	8.9	8.8
Suspended Solids	mg/l		*3*	*3*	*3*
Phenol	mg/L		*0.005*	*0.005*	*0.005*

Determinant	Units	ANZECC STOCK	HS1	HS2	HS3
VFA	mg/L		*2.5*	*2.5*	*2.5*
TOC	mg/L		7.6	7.4	7.4
Alkalinity	mg CaCO3/L		57	59	59
Conductivity	mS/m		23.4	23.9	24.1
COD	mg/L		33	29	31
BOD5-Total	mg/L		2	2	1
Faecal coliforms	col/100ml	100	56	**150**	**140**
Chloride	mg/L		22.8	23.6	23.7
Nitrate-N	mg/L	90.3	0.05	0.08	0.09
Sulphate	mg/L	1000	17.7	17.8	17.9
Ammonia-N	mg/L		0.03	0.04	0.05
Hardness	mg CaCO3/L		63	68	68
Calcium	mg/L	1000	13.4	14.5	14.8
Magnesium	mg/L		7.22	7.57	7.59
Potassium	mg/L		1.59	1.65	1.70
Sodium	mg/L		21.2	21.8	21.6
D.R. Phosphorus	mg/L		0.163	0.171	0.176
Aluminium	mg/L	5	0.008	0.008	0.007
Arsenic	mg/L	0.1	0.002	0.002	0.002
Boron	mg/L	5	0.05	0.05	0.05
Cadmium	mg/L	0.01	*0.0001*	*0.0001*	*0.0001*
Chromium	mg/L	1	*0.0005*	*0.0005*	*0.0005*
Copper	mg/L	0.4#	0.0007	0.0007	0.0007
Iron	mg/L		0.076	0.093	0.101
Lead	mg/L	0.1	*0.00025*	*0.00025*	*0.00025*
Manganese	mg/L		0.0094	0.0110	0.0125
Nickel	mg/L	1	*0.00025*	*0.00025*	*0.00025*
Zinc	mg/L	20	*0.001*	*0.001*	*0.001*

Note: # copper trigger values range from 0.4 mg/L for sheep, up to 5 mg/L for poultry. **Bold** – denotes an exceedance of the ANZECC Livestock Drinking Water Trigger Values. All `<' values have been reported as half the detection limit for statistical purposes and are expressed in italics.

There were **three exceedances of the resource consent conditions** in samples from the shallow aquifer down-gradient to the leachate irrigation area:

- pH level in sampling location HS1 was above the ANZECC Livestock Drinking Water Trigger Values.
- Faecal coliform level in sampling locations HS2 and HS3 exceeded the ANZECC Livestock Drinking Water Trigger Values.

2.8 Tatana's Property Drain

Four sampling points were selected to represent upstream (SW1), midstream (SW2 and SW3) and downstream (SW4) flows at the Tatana property (see Site Plan in Appendix A). Test parameters were selected in conjunction with Horizons Regional Council. Results from the January 2019 sampling round are presented in Table 2-10 and have been compared with the ANZECC Livestock Drinking Water Trigger Values because the water is most reflective of shallow groundwater. **Results from the Tatana's Property drain sampling points are presently not subjected to any consenting conditions.**

Table 2-10: Tatana's Drain Results for January 2019

Determinant	Units	ANZECC STOCK	SW1	SW2	SW3	SW4
pH		6 to 9	6.9	7.5	7.2	7.4
Total Suspended Solids	mg/L		353	11	26	12
Conductivity	mS/m		271	178	73.7	77.3
COD	mg/L		329	136	43	64
Total Kjeldahl Nitrogen	mg/L		119	50.8	12.9	12.5
BOD5-Total	mg/L		61	34	*3*	*3*
Chloride	mg/L		239	180	79.3	81.7
Nitrite-N	mg/L		0.15	0.54	0.11	0.09
Nitrate-N	mg/L	90.3	1.80	5.20	0.65	0.16
Ammonia-N	mg/L		110	46.8	10.3	9.7
Total-N	mg/L		119	54.2	11.8	10.8
Iron	mg/L		1.07	0.25	0.50	0.29
Manganese	mg/L		0.969	0.691	0.104	0.225

Note: **Bold** – denotes an exceedance of the ANZECC Livestock Drinking Water Trigger Values. All `<' values have been reported as half the detection limit for statistical purposes and are expressed in italics. Cells coloured beige indicates highest level recorded since monitoring began.

For comparison purposes, the suite of parameters tested complies with the ANZECC Livestock Drinking Water Trigger Values and therefore meets the resource consent requirements for quality of shallow groundwater near Levin Landfill.

Several sampling locations along the Tatana Property Drain which recorded their highest nitrite, nitrate and pH concentrations since monitoring began during the October 2018 monitoring round have returned to their historical levels. However, during the January 2019 monitoring round, chloride concentration at sampling location SW1 and nitrite-N at SW2 were at the highest level since monitoring began. Further discussion is provided in Section 3 of this report.

3. Discussion

3.1 Background Groundwater Quality

Water quality from the natural background water up-gradient from the landfill site is not subjected to any consenting conditions.

Results since 2010 from the background bores indicate that low pH values are representative of background water quality in the shallow sand aquifer. The deeper gravel aquifer has pH levels that are slightly higher but occasionally dip below the DWSNZ lower guideline of 7.

Iron and manganese concentrations have fluctuated considerably at both the shallow and deep aquifers since monitoring began and is occasionally above the DWSNZ GV. Elevated iron and manganese concentrations in groundwater is likely to be related to hydrogeological conditions found at the site and are common in groundwater in this area.

During the January 2019 sampling round, several parameters recorded their highest levels since monitoring began (sulphate concentrations at bores G1S and G1D and chloride, hardness, magnesium and D.R. phosphorus concentrations at G1S). Most notably however were the sulphate concentrations at bore G1S and G1D which recorded 1,920 and 1,790 mg/L respectively. There were good reasons to suspect sample contamination as typical sulphate concentrations at these bores have fluctuated between 10-30 mg/L since monitoring began in 2010. It is recommended that these bores be sampled again to determine if these results are truly reflective of what is happening in the groundwater at these locations.

The recent monitoring result suggests that the background groundwater is being impacted by local ground conditions and/or activities up-gradient of the landfill.

3.2 Shallow Aquifer Groundwater Quality

3.2.1 Hydraulically Up-gradient from the Old landfill

Sampling results from the January 2019 monitoring round show that water quality from the shallow monitoring bores hydraulically up-gradient from the old landfill complies with the discharge consent conditions

During the January 2019 sampling round, alkalinity concentration at bore D1 was recorded the highest level since monitoring began. However, the exceedance is only marginal when compared to historical results. Further monitoring is needed to confirm if it is indicative of an increasing trend.

In general, historical trends of leachate indicators chloride, boron and ammoniacal nitrogen in the D-series and E1S bores are similar to the concentrations in the background bore G1S. However, nitrate nitrogen is elevated in bores D1 and D6 when compared to background (G1S) as shown in Figure 3-1 and has appeared to be increasing. These bores are both located down gradient of the new landfill, with bore D1 located hydraulically up-gradient of the leachate effluent pond and bore D6 located down gradient of the leachate pond. Other leachate indicators such as boron, chloride and ammoniacal nitrogen are all consistent with background concentrations and historical record.

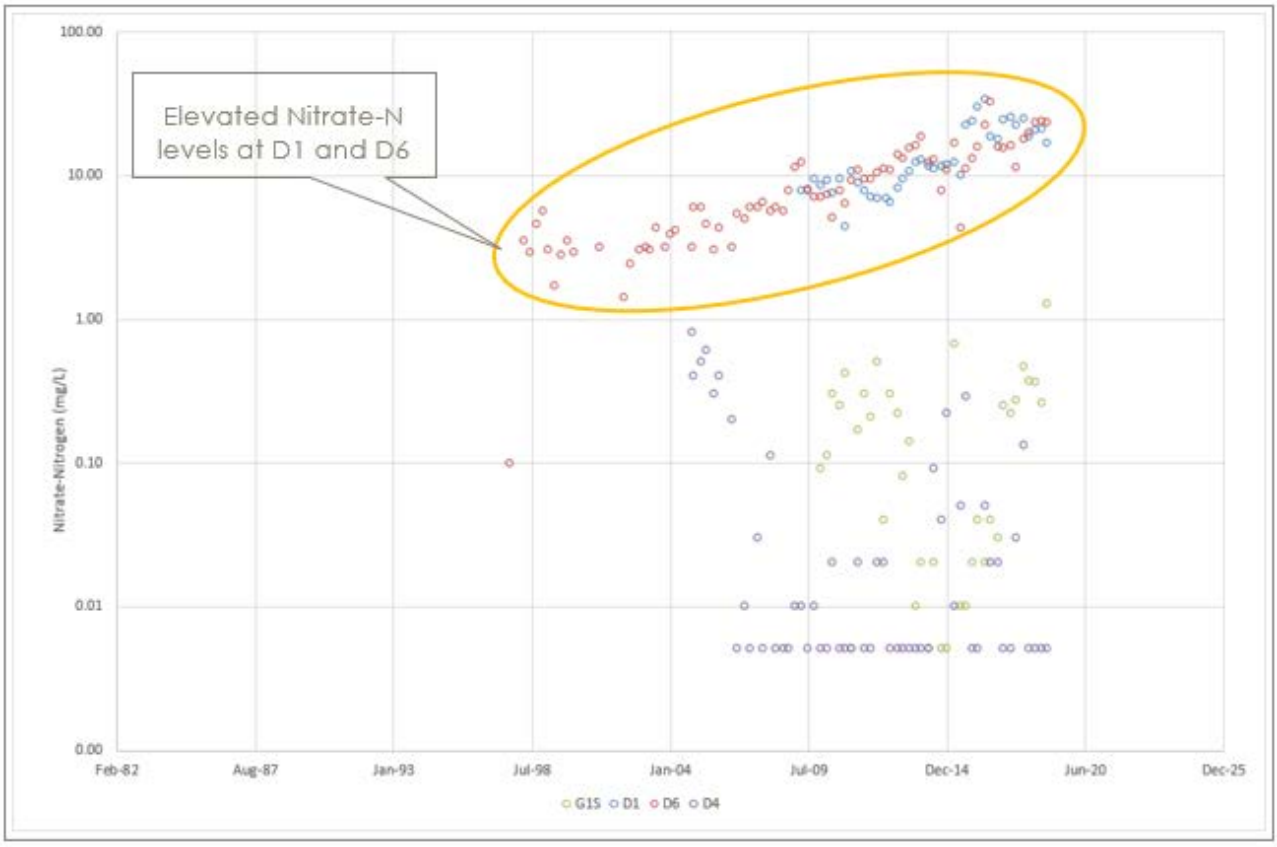


Figure 3-1: Nitrate Nitrogen Concentration in the D-Series Bores

Ammoniacal nitrogen is not elevated in either of these bores. In previous quarterly reports, it was recommended that further investigations be carried out to identify the possible cause (or causes) of the elevated levels of nitrate nitrogen in bores D1 and D6.

Such investigations should include for regular monitoring of groundwater levels to be undertaken in all the bores monitored for the 2018-2019 monitoring period so that groundwater flow and the depth of the unsaturated zone can be assessed. This will enable more conclusions to be drawn in the 2018-2019 annual report as to the source of the elevated nitrate nitrogen values.

3.2.2 Irrigation area

Sampling results from all shallow bores located hydraulically down-gradient of the irrigation area (F series bores) comply with the discharge consent conditions.

Historical trends of leachate indicators chloride, boron and ammoniacal nitrogen in the F-series bores are generally stable and did not show any indication of an increasing trend.

3.2.3 Hydraulically Down-gradient from the Old landfill

Sampling results from the shallow bores located hydraulically down-gradient of the old landfill complies with the discharge consent conditions (ANZECC Livestock Drinking Water Trigger Values).

Historical trends of leachate indicators in these bores show some elevation in the concentration of ammoniacal nitrogen above the background bore (G1S), particularly in bore C2DS however the concentration of ammoniacal nitrogen remains much lower than the shallow bores screened within the leachate plume and therefore it appears that the leachate plume from the old landfill is having a minimal effect on deeper groundwater.

Bores C1 and G2S are located down gradient of the old landfill to the east. These bores have consistently recorded low concentrations of ammoniacal nitrogen, with G2S often recording concentrations below detection limit. These bores are likely to be located beyond the eastern edge of the leachate plume.

Bores B1, B2, B3 and C2 all appear to be located and screened within the leachate plume and have elevated concentrations of ammoniacal nitrogen. All four bores are plotted in Figure 3-2, along with the background bore, G1S. It is noted that the concentration of ammoniacal nitrogen in bore C2 has been increasing since 2009, though appears to be decreasing for this quarter, while the concentration of ammoniacal nitrogen in bore B2 appears to have been increasing during the same period. It is possible that the leachate plume has shifted resulting in the different spatial pattern from five years ago. The regular monitoring of the groundwater levels in the bores over the 2018-2019 monitoring period will allow further conclusions to be drawn in the next annual report.

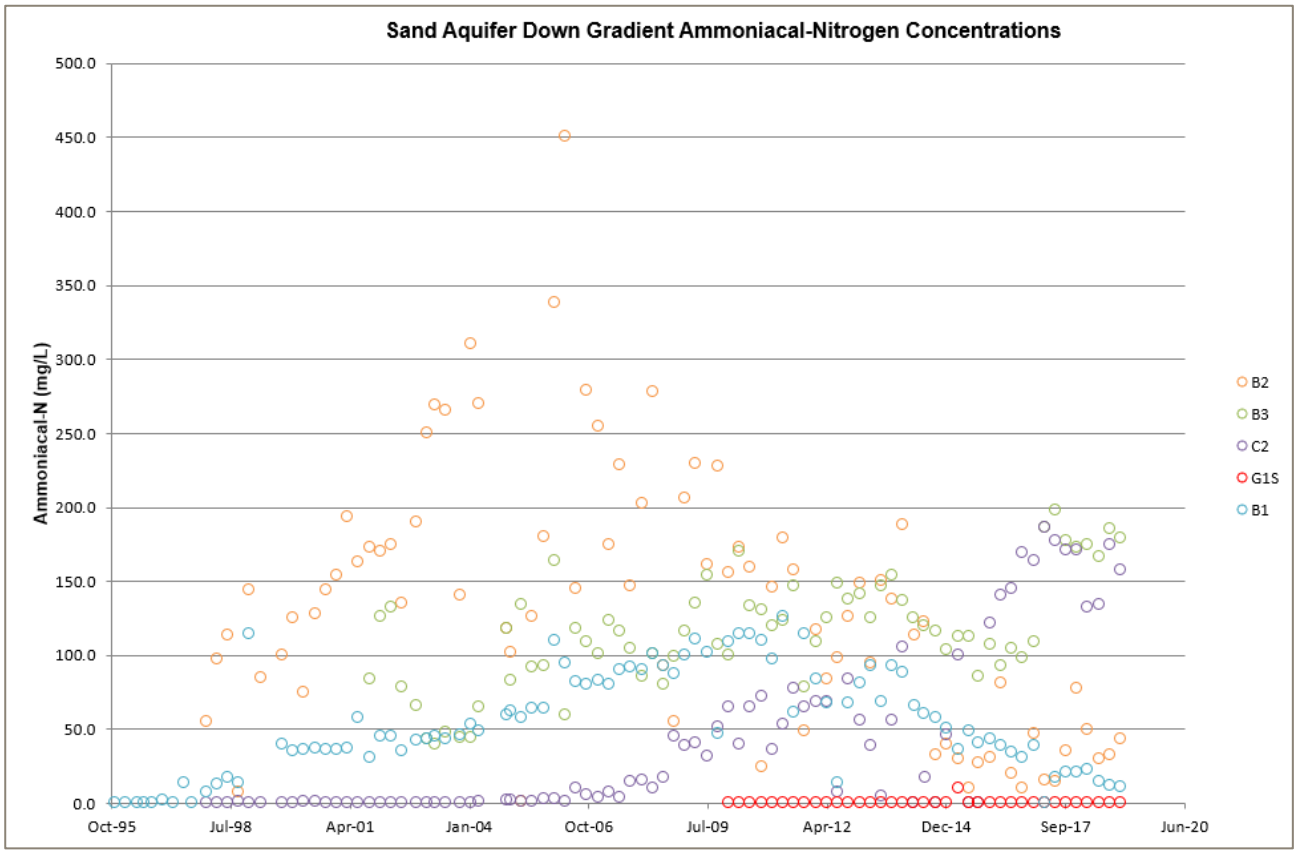


Figure 3-2: Shallow Bores Screened in the Leachate Plume

Given the apparent shift in the leachate plume, it is appropriate to assess the overall trend for all bores located and screened in the leachate plume. The overall trend indicates that the concentration of ammoniacal nitrogen has been declining over time since 2006. Other key leachate indicators, boron, conductivity and chloride are also all elevated within the bores that are located and screened in the leachate plume as would be expected.

During the January 2019 comprehensive monitoring round, water samples taken from bores B1, B2, B3s, C2, C2DS, G2S were analysed for typical SVOCs (72 parameters) and VOCs (65 parameters) as per the discharge consent 6010. Low levels of styrene, benzene, toluene and chlorobenzene were detected in some of the bores. All parameters detected were below the DWSNZ MAV and so the results comply with the resource consent conditions.

3.3 Deep Aquifer Groundwater Quality

There was one exceedance to the resource consent condition for deep gravel aquifer during the January 2019 sampling round where manganese concentration at C2DD exceeded the DWSNZ MAV. However, the exceedance is marginal when compared to historical results.

3.4 Leachate Effluent

Monitoring results from the leachate effluent samples are not required to meet either the ANZECC or DWSNZ standards. Results from the January 2019 monitoring round were all within the typical leachate composition range for Class 1 landfills published in the WasteMINZ 2018 Technical Guidelines for Disposal to Land, except for chromium. The value obtained for chromium is at the high end of the range for Class 2 landfills which accept largely Construction and Demolition type waste.

The concentration of heavy metals such as cadmium, arsenic and lead within the landfill leachate were particularly low compared to typical concentrations for Class 1 landfills.

3.5 Hokio Stream

pH level in sampling location HS1 located up-stream of the old landfill was above the ANZECC Livestock Drinking Water Trigger Values. The elevated pH values observed during the January 2019 monitoring round was consistent with historical results and representative of ground water quality in the area.

Water quality at sampling points HS2 and HS3 of Hokio Stream, located down-stream of the old landfill, has faecal coliform levels above the ANZECC Livestock Drinking Water Trigger Values at 150 and 140 col/100mL respectively. No faecal coliform was detected at HS1.

The Tatana's Property Drain joins the Hokio Stream downstream of HS2. Therefore, contamination effect from the Tatana Drain, if any, would have an impact on water quality at HS3, and not at HS2 as observed. Faecal coliform detected at HS2 and HS3 therefore suggests that water quality at Hokio Stream may have been impacted by localised ground activities during or prior to sampling taking place.

Leachate indicators suggest that leachate from the landfill is not having an adverse environmental effect on the Hokio Stream.

3.6 Tatana's Property Drain

Monitoring results from the Tatana's Property drain samples are not required to meet either the ANZECC or DWSNZ standards.

Historical results indicate concentrations of COD, TKN, chloride, ammonia-N and Total-N to fluctuate significantly, particularly at the upstream of Tatana's drain. This implies localised impact upstream of the drain, possibly from farming activities, but also possibly from the groundwater.

The results obtained from samples where the Tatana's drain discharges into Hokio Stream did not show any impact from the discharge of the drain.

High level of suspended solids at SW1 indicated disturbance to the soil/ drain upstream not related to landfill activities.

During the January 2019 sampling round chloride concentration at SW1 and nitrite-N at SW2 were at their highest levels since monitoring began in 2015. However, the exceedances were marginal when compared to historical results. Close monitoring of chloride and nitrite-N concentrations during the April 2019 monitoring round is recommended to confirm if it is indicative of a rising trend.

3.7 Consent Compliance

Discharge permit 6010 states that quarterly and annual monitoring results should comply with the ANZECC Livestock Drinking Water Trigger Values in the shallow groundwater aquifer (sand aquifer) and surface water bodies. Samples from the deep groundwater (gravel aquifer) should comply with DWSNZ. Should any parameters be more than these guidelines, the permit holder shall report to the Regional Council as soon as practicable on the significance of the results and, where the change can be attributed to landfill leachate, consult with the Regional Council to determine if further investigation or remedial measures are required.

Shallow sand aquifer

There were **no exceedances** of the resource consent conditions during the January 2019 sampling round.

Deeper gravel aquifer

There was **one exceedance** of the resource consent conditions in samples from the deep gravel aquifer during the January 2019 sampling round:

- Manganese concentration in bore C2DD exceeded the DWSNZ MAV.

Hokio stream

There were **three exceedances** of the resource consent conditions during the January 2019 monitoring round:

- pH level in sampling location HS1 exceeded the ANZECC Livestock Drinking Water Trigger Values
- Faecal coliform level in sampling locations HS2 and HS3 exceeded the ANZECC Livestock Drinking Water Trigger Values.

4. Conclusions

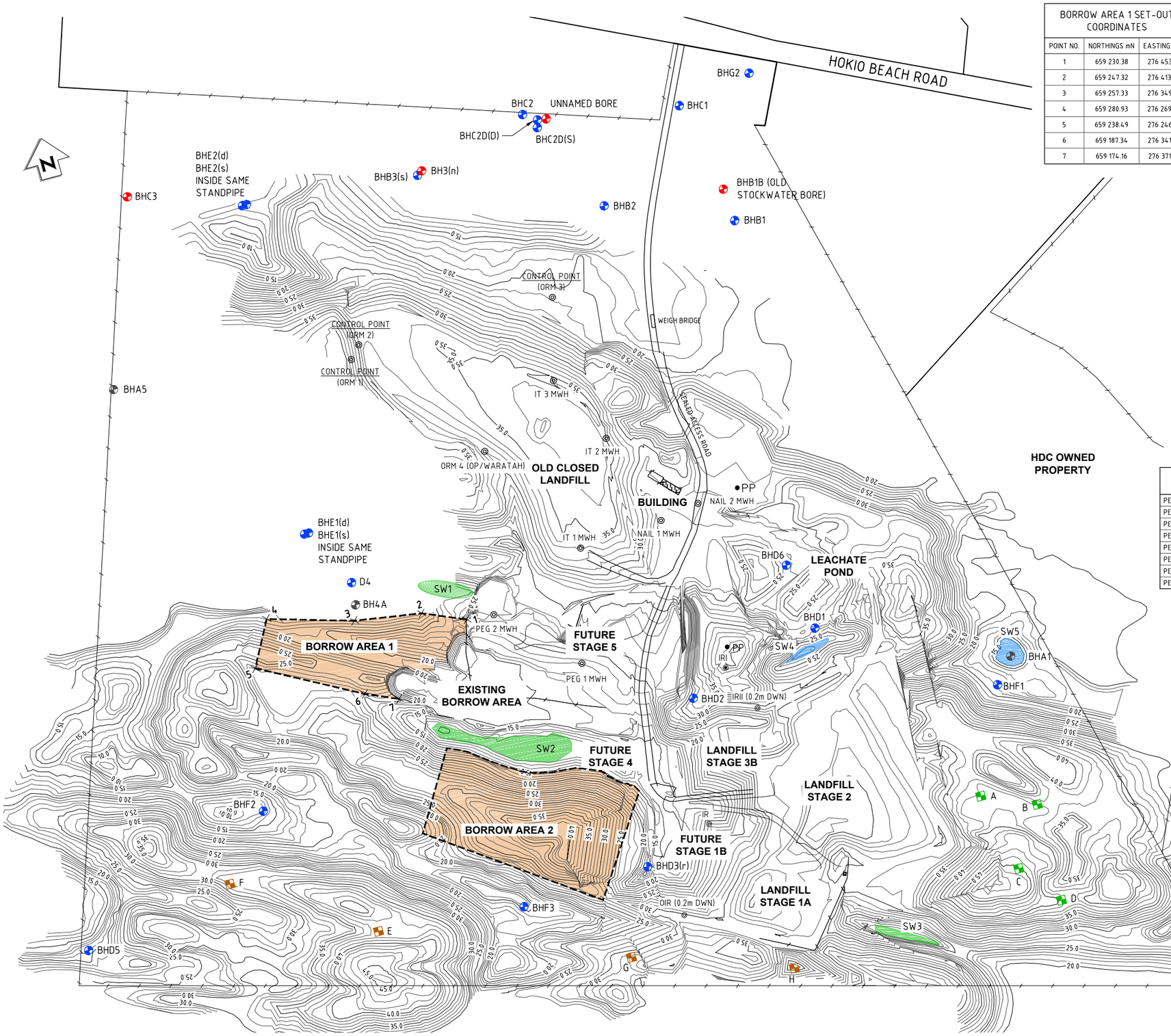
Current monitoring results suggests that the background groundwater is being impacted by local ground conditions, the old unlined landfill and/or activities up-gradient of the landfill.

During the January 2019 monitoring period there were four exceedances of the resource consent conditions. The deep-water bore C2DD located immediately down-gradient hydraulically of the old unlined landfill showed a manganese concentration marginally above the DWSNZ MAV. The concentration of manganese at this bore is consistent with historical results and is representative of ground water quality in the area. There were three exceedances from surface monitoring at the Hokio Stream; pH upstream of the old landfill (HS1), faecal coliform at mid-stream (HS2) and downstream (HS3) of the old landfill were all above the ANZECC Livestock Drinking Water Trigger Values. Exceedances in pH and faecal coliform were consistent with historical results and may be related to localised activities.

Bore G1S had elevated levels of chloride and especially sulphate, which parameter was also at its highest recorded level in Bore G1D, far exceeding previous levels. It is recommended that bores G1S and G1D be sampled again to check whether this is a new trend.

Appendices

Appendix A Site Plans



DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1

BORROW AREA 1 SET-OUT COORDINATES		
POINT NO.	NORTHINGS mN	EASTINGS mE
1	659 230.38	276 453.28
2	659 247.32	276 413.49
3	659 257.33	276 349.62
4	659 280.93	276 269.42
5	659 238.49	276 246.50
6	659 187.34	276 341.04
7	659 174.16	276 371.33

BORE LOCATIONS AND DETAILS						
BORE HOLE NO	NORTHING mN	EASTING mE	R.L. (m)	DEPTH OF WELL (m)	PIEZOMETER DIAMETER (mm)	FUNCTION
A1	659 060.15	276 944.89	12.95			SHALLOW AQUIFER
A2 (DESTROYED)						SHALLOW AQUIFER
A3 (DESTROYED)						SHALLOW AQUIFER
A4	659 271.67	276 354.72	10.10			SHALLOW AQUIFER
A5	659 530.47	276 185.91	9.62			SHALLOW AQUIFER
B1	659 561.81	276 797.35	9.04	4.3	40	SHALLOW AQUIFER
B1B (STOCK BORE)	659 530.08	276 799.91	9.28	10		
B2	659 576.32	276 683.50	9.42	3.5	50	SHALLOW AQUIFER
B3(s)	659 651.19	276 519.52	7.76	2.83	50	SHALLOW AQUIFER
B3(n)	659 654.26	276 524.38	7.49	2.33	32	DEEP AQUIFER
C1	659 649.64	276 777.83	7.47	3.60	50	SHALLOW AQUIFER
C2	659 680.80	276 631.22	7.50	2.81	32	SHALLOW AQUIFER
C2D(s)	659 671.19	276 641.63	10.13	12.88	32	SHALLOW AQUIFER
C2D(d)	659 671.19	276 641.63	10.11	18.85	32	DEEP AQUIFER
C3	659 704.29	276.246.89	7.22	2.8	32	SHALLOW AQUIFER
D1	659 134.97	276 771.65	27.46	23.69	50	EARLY DETECTION
D2	659 101.02	276 642.06	32.12	29.46	50	EARLY DETECTION
D3-DESTROYED						
D4	659 293.20	276 022.4	20.50	17.0		SHALLOW AQUIFER
D5	659 020.80	276 356.60	17.8	18		SHALLOW AQUIFER BACKGROUND
D6	659 200.31	276 761.08	26.41	16.07	50	EARLY DETECTION
E1(d)	659 349.54	276 329.48	20.91	37.80	32	SHALLOW AQUIFER
E1(s)	659 349.54	276 329.48	20.91	20.05	32	DEEP AQUIFER
E2(s)	659 667.30	276 354.69	13.15	15.24	32	SHALLOW AQUIFER
E2(d)	659 667.30	276 354.69	13.15	28.66	32	DEEP AQUIFER
F1	659 037.10	276 925.50	18.90	15.0	50	SHALLOW AQUIFER LEACHATE IRRIGATION
F2	659 105.00	276 218.00	13.50	10.2	50	SHALLOW AQUIFER LEACHATE IRRIGATION
F3	658 951.7	276 434.0	16.70	10.5	50	SHALLOW AQUIFER LEACHATE IRRIGATION
G1(s) [4]	658 786	277 046	24	15	50	SHALLOW AQUIFER BACKGROUND
G1(d) [4]	658 786	277 046	24	31.5	50	DEEP AQUIFER BACKGROUND
G2 [4]	659 673	276 835	8	4	50	SHALLOW AQUIFER
D3(r) REINSTATED [4]	658 953	276 552	18	10	50	EARLY DETECTION
COORDINATES ARE IN TERMS OF NEW ZEALAND GEODETIC DATUM 1949: WANGANUI CIRCUIT						

SOIL MONITORING LOCATIONS	CO-ORDINATES		LEVEL (m)
	NORTHING mN	EASTING mE	
PEG A	658 938.80	276 882.30	39.2
PEG B	658 917.00	276 932.10	39.5
PEG C	658 862.70	276 899.00	46.1
PEG D	658 822.90	276 930.40	40.4
PEG E	658 965.50	276 294.00	36.6
PEG F	659 046.20	276 169.10	32.9
PEG G	658 878.00	276 520.20	32.6
PEG H	658 827.40	276 667.60	23.5

COORDINATES OF SURVEY CONTROL MARKS			
PT	NORTHING mN	EASTING mE	RL
ORM 1	659 498.38	276 412.21	38.94
ORM 2	659 510.09	276 422.72	34.98
ORM 3	659 505.14	276 612.86	21.10
ORM 4(OP/W)	659 380.16	276 511.94	30.92
MWH NAIL 1	659 272.67	276 656.87	27.61
MWH NAIL 2	659 278.98	276 695.22	28.40
MWH IT 1	659 267.33	276 576.02	30.03
MWH IT	659 361.94	276 627.00	33.70
MWH IT 3	659 428.24	276 593.00	32.74
MWH PEG 1	659 160.94	276 548.30	32.99
MWH PEG 2	659 227.86	276 479.35	30.49

NOTES:

1. LEVELS ARE TOP OF STANDPIPE. WHERE THERE IS NO STANDPIPE, LEVELS ARE TOP OF PVC PIPE.
2. BHA2, BHA3 AND BHD3 HAVE BEEN LOST DUE TO SITE WORKS.
3. "A" SERIES BORE HOLES ARE AUGER HOLES ONLY AND MAY NOT BE ABLE TO BE LOCATED.
4. BORES INSTALLED IN AUG 2009. DETAILS ARE APPROXIMATE.
5. CONTOUR INTERVALS: 5m MAJOR, 1m MINOR

LEGEND

- MONITOR BORES CURRENTLY SAMPLED (FROM JAN 2010)
- BORES NOT SAMPLED
- SHALLOW HANDAUGER STANDPIPES NOT ABLE TO BE LOCATED
- SOIL SAMPLING LOCATION PEG - MONITORED
- SOIL SAMPLING LOCATION PEG - NOT MONITORED
- EXISTING STORMWATER SOAKAGE AREA
- PROPOSED STORMWATER SOAKAGE AREA
- PROPOSED BORROW AREAS

FOR INFORMATION ONLY

REV	REVISIONS	DRN	CHK	APP	DATE
A	FOR INFORMATION	BCJ	PSL	PEL	17.10.17

SURVEYED	MWH	
DESIGNED	N/A	-
DRAWN	Brent James	10.2017
CAD REVIEW	Brent James	16.10.17
DESIGN CHECK	Matthew Chung	16.10.17
DESIGN REVIEW	Phil Landmark	16.10.17
APPROVED	Phil Landmark	16.10.17
PROF REGISTRATION:		

MWH

Client:

HOROWHENUA DISTRICT COUNCIL
LEVIN LANDFILL

MONITORING BORES, SOIL SAMPLING LOCATIONS & BORROW AREAS
SITE PLAN, LOCATION AND DETAILS

Status Stamp: FOR INFORMATION ONLY
Date Stamp: 17.10.17
Scales:
Drawing No.: 80500724-17-001-G001
Rev.: A

pw:\\asiavpwint04.mwhglobal.com:AP_PROJECTS\Documents\New Zealand Clients\Horowhenua District Council\80500724 - Levin Landfill Volumes\2017\General\80500724-17-001-G001

Hokio Stream (“HS”) and Tatana’s Property Drain (“SW”) Monitoring Locations

Appendix B Sampling Schedule

LEVIN LANDFILL - SUMMARY OF SURFACE AND GROUNDWATER MONITORING REQUIREMENTS (July 2017 - April 2020).

(The testing regime is based on Consent Conditions following the May 2010 Resource Consent Review. It takes no account of changes proposed for the 2016/2017 Review, or of the additional testing done by HDC on adjoining Tatana Property).

Reports Due		Sampling Month	Table A (Condition 3, DP 6010)				Table B (Condition 3, DP 6010)																		Table C (Condition 3, DP 6010)			
			Deep Aquifer Bores*				Shallow Aquifer Bores*														Irrigation Bores*				Hokio Stream			Leachate Pond
Annual	Quarterly		C2dd	E1d	E2d	G1d	C1	C2	C2ds	D4	B1	B2	B3s	E1s	E2s	D1#	D2#	D3r#	D6#	G1s	G2s	D5@	F1@	F2@	F3@	HS1	HS2	HS3	
Aug-17	**Aug-17**	**Jul-17**	I	I + SW	I	I	I	I	I	I + SW	I	I	I	I + SW	I + SW	I	I + SW	I + SW	I	I + SW	I	I	I	I	I + SW	C	C	C	C
	Nov-17	**Oct-17**	I	I + SW	I	I	I	I	I	I + SW	I	I	I	I + SW	I + SW	I	I + SW	I + SW	I	I + SW	I	I	I	I	I + SW	I	I	I	I
	Feb-18	**Jan-18**	C	C	C	C	C	C + A	C + A	C	C + A	C + A	C + A	C	C	C	C	C	C	C	C + A	C	C	C	C	C	C	C	C + A
	May-18	**Apr-18**	I	I + SW	I	I	I	I	I	I + SW	I	I	I	I + SW	I + SW	I	I + SW	I + SW	I	I + SW	I	I	I	I	I + SW	I	I	I	I
Aug-18	**Aug-18**	**Jul-18**	I	I + SW	I	I	I	I	I	I + SW	I	I	I	I + SW	I + SW	I	I + SW	I + SW	I	I + SW	I	I	I	I	I + SW	C	C	C	C
	Nov-18	**Oct-18**	I	I + SW	I	I	I	I	I	I + SW	I	I	I	I + SW	I + SW	I	I + SW	I + SW	I	I + SW	I	I	I	I	I + SW	I	I	I	I
	Feb-19	**Jan-19**	C	C	C	C	C	C + A	C + A	C	C + A	C + A	C + A	C	C	C	C	C	C	C	C + A	C	C	C	C	C	C	C	C + A
	May-19	**Apr-19**	I	I + SW	I	I	I	I	I	I + SW	I	I	I	I + SW	I + SW	I	I + SW	I + SW	I	I + SW	I	I	I	I	I + SW	I	I	I	I
Aug-19	**Aug-19**	**Jul-19**	I	I + SW	I	I	I	I	I	I + SW	I	I	I	I + SW	I + SW	I	I + SW	I + SW	I	I + SW	I	I	I	I	I + SW	C	C	C	C
	Nov-19	**Oct-19**	I	I + SW	I	I	I	I	I	I + SW	I	I	I	I + SW	I + SW	I	I + SW	I + SW	I	I + SW	I	I	I	I	I + SW	I	I	I	I
	Feb-20	**Jan-20**	C	C	C	C	C	C + A	C + A	C	C + A	C + A	C + A	C	C	C	C	C	C	C	C + A	C	C	C	C	C	C	C	C + A
	May-20	**Apr-20**	I	I + SW	I	I	I	I	I	I + SW	I	I	I	I + SW	I + SW	I	I + SW	I + SW	I	I + SW	I	I	I	I	I + SW	I	I	I	I

Measure groundwater level and sample all bores for CH_4, CO_2 and O_2 each time that groundwater is sampled (Condition 3a of DP 6011)

Notes:

C	Comprehensive list see below
I	Indicator list see below
A	Additional VOC and SVOC analysis
SW	Add sodium and iron analysis (for stormwater consent 102559)
FC	Add faecal coliform test
*	Additional parameters (pesticides and semi-VOC) to be analysed for if any leachate indicator parameters show leachate influence over 3 consecutive sampling rounds (Table B, Condition 3 of DP 6010).
@	If irrigation re-commences then the annual sampling is to change from comprehensive + 3 times indicator to bi-annual comprehensive + indicator (Clause D of Condition 3, DP 6010) .

A reduction in sampling frequency at any **groundwater monitoring point** is conditional on (Clauses A - D of Condition 3, DP 6010):

A. Completion of the initial monitoring program;
B. Good consistency of groundwater sample analysis results, or a clearly identified reason for inconsistent results that excludes the contaminant source being landfill operations, stored waste or leachate;
C. No decline in groundwater quality as determined from indicator parameter trends over a period of four consecutive sampling rounds;
D. If a well being monitored on a conditional frequency becomes non-compliant with condition C, the monitoring frequency for that well should return to the initial monitoring frequency until conditions B and C are again being fulfilled.

If site management planning indicates any **early detection monitoring well** is likely to become buried or otherwise destroyed within the following year as a result of normal operations (Clauses E - F, Condition 3, DP 6010):

E. This must be communicated to the regional council;
F. A replacement well is to be constructed in a position agreed upon with Horizons Regional Council
G. The replacement well should be installed in a position suitable to act as a early detection well and be classed as an early detection well;
H. The replacement well should be constructed as a nested well (or two separate wells) with screens positioned in both shallow and deep aquifers.

A reduction in sampling frequency at the **Hokio Stream monitoring locations** is conditional on (Clauses I - L, Condition 3 of DP 6010):

I. Completion of the initial 2 year monitoring program;
J. Good consistency of water sample analysis results, or a clearly identified reason for inconsistent results that excludes the contaminant source being landfill operations, stored waste or leachate;
K. No decline in water quality between monitoring sites HS1 and HS3 as determined from indicator parameter trends over a period of four consecutive sampling rounds;
L. If the Hokio Stream monitoring locations are being sampled on a conditional frequency and become non-compliant with condition K, the monitoring frequency for all three monitoring locations should return to the base case intensive monitoring until conditions J and K are again being fulfilled.

A reduction in sampling frequency at the **leachate pond outlet** is conditional on (Clauses M - P, Condition 3, DP 6010):

M. Completion of the initial 2 year monitoring program;
N. Good consistency of water sample analysis results, or a clearly identified reason for inconsistent results;
O. No decline in water quality over a period of four consecutive sampling rounds;
P. If the leachate pond outlet is being sampled on a conditional frequency and becomes non-compliant with condition O, the monitoring frequency should return to the base case intensive monitoring until conditions N and O are again being fulfilled.

COMPREHENSIVE PARAMETER LIST (Table E of Condition 3, DP 6010)

Characterising parameters	pH
	electrical conductivity (EC)
	alkalinity
	total hardness
	suspended solids
Oxygen demand	COD and BOD
Nutrients*	NO3-N, NH4-N, DRP and SO_4
Metals*	Al, As, Cd, Cr, Cu, Fe, Mg, Mn, Ni, Pb and Zn
Other elements	B, Ca, Cl, K and Na
Organics	Total organic carbon, total phenols, volatile acids
Biological	Faecal coliforms

* Analyses performed for nutrients and metals are for dissolved rather than total concentrations

INDICATOR PARAMETER LIST (Table F, Condition 3, DP 6010)

Characterising parameters	pH
	electrical conductivity (EC)
Oxygen demand	COD
Nutrients*	NO3-N and NH4-N
Metals*	AL, Mn, Ni and Pb
Other elements	B and Cl
Biological+	Faecal coliforms

* Analyses performed for nutrients and metals are for dissolved rather than total concentrations

+ faecal coliform added from April 2019 sampling onwards

Appendix C Analytical Results

eurofins | ELS

Eurofins ELS Limited

Analytical Report

Downer EDI Levin - Landfill
P O Box 642
LEVIN 5540
Attention: Bruce Marshall

Report Number: 18/51674
Issue: 1
12 February 2019

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-01	Levin Leachate Pond		09/01/2019 00:00	09/01/2019 16:19	0

Notes: 99476-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0001	pH	7.6		Jennifer Mont KTP
0002	Suspended Solids - Total	72	g/m³	Marylou Cabral KTP
0040	Total (NP) Organic Carbon	753	g/m³	Tracy Morrison KTP
0052	Alkalinity - Total	6,480	g CaCO3/m³	Marylou Cabral KTP
0055	Conductivity at 25°C	1,530	mS/m	Jennifer Mont KTP
0081	Chemical Oxygen Demand	2,790	g/m³	Marylou Cabral KTP
0085	BOD5 - Total	137	g/m³	Gordon McArthur KTP
0602	Chloride	1,140	g/m³	Shanel Kumar KTP
0605	Nitrate - Nitrogen	0.08	g/m³	Shanel Kumar KTP
0607	Sulphate	88.3	g/m³	Shanel Kumar KTP
0760	Ammonia Nitrogen	1,320	g/m³	Divina Lagazon KTP
1642	Total Hardness	578	g CaCO3/m³	Shanel Kumar KTP
1760	Calcium - Total	113	g/m³	Shanel Kumar KTP
1769	Iron - Total	6.18	g/m³	Shanel Kumar KTP
1772	Magnesium - Total	71.7	g/m³	Shanel Kumar KTP
1784	Sodium - Total	1,020	g/m³	Shanel Kumar KTP
2088	Dissolved Reactive Phosphorus	11.7	g/m³	Divina Lagazon KTP
6601	Aluminium - Total	0.780	g/m³	Shanel Kumar KTP
6603	Arsenic - Total	0.504	g/m³	Shanel Kumar KTP
6607	Boron - Total	6.62	g/m³	Shanel Kumar KTP
6608	Cadmium - Total	< 0.001	g/m³	Tracy Morrison KTP
6611	Chromium - Total	0.666	g/m³	Shanel Kumar KTP
6613	Copper - Total	0.019	g/m³	Shanel Kumar KTP
6618	Lead - Total	0.005	g/m³	Shanel Kumar KTP
6621	Manganese - Total	1.47	g/m³	Shanel Kumar KTP
6624	Nickel - Total	0.140	g/m³	Shanel Kumar KTP
6626	Potassium - Total	698	g/m³	Tracy Morrison KTP
6638	Zinc - Total	0.148	g/m³	Shanel Kumar KTP
M0102	Faecal Coliforms	100	cfu/100ml	Juana Tamayo KTP
MO-5001	Volatile Fatty Acids	15 *	g/m³	Deb Bottrill (Transcribed)
MO-5002	Total Halogenated Phenolics	0.13	g/m³	Deb Bottrill (Transcribed)
P1855	Aqueous Total Metal Digestion	Completed		Ed Analyst
SVOC-002	a-BHC	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-003	a-chlordane	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-005	b-BHC	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-006	cis-Permethrin	< 0.0010	mg/L	Ganesh Ilancko KTP
SVOC-007	Dieldrin	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-008	Endosulfan II	<0.005	mg/L	Ganesh Ilancko KTP
SVOC-009	Endosulfan Sulfate	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-010	Endrin	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-011	Endrin Aldehyde	<0.001	mg/L	Ganesh Ilancko KTP
SVOC-012	Endrin Ketone	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-013	Gamma-Chlordane	<0.001	mg/L	Ganesh Ilancko KTP
SVOC-014	Heptachlor	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-015	Heptachlor Epoxide	<0.0001	mg/L	Ganesh Ilancko KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-01	Levin Leachate Pond		09/01/2019 00:00	09/01/2019 16:19	0

Notes: 99476-0 Levin Landfill Sample

	Test	Result	Units	Signatory
SVOC-016	Hexachlorobenzene	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-017	Lindane (g-BHC)	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-018	Methoxychlor	< 0.0050	mg/L	Ganesh Ilancko KTP
SVOC-019	p,p'-DDD	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-020	p,p'DDE	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-021	p,p'-DDT	<0.001	mg/L	Ganesh Ilancko KTP
SVOC-022	Procymidone	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-023	Propanil	<0.001	mg/L	Ganesh Ilancko KTP
SVOC-024	Endosulfan I	<0.001	mg/L	Ganesh Ilancko KTP
SVOC-025	Alachlor	< 0.0010	mg/L	Ganesh Ilancko KTP
SVOC-026	Aldicarb	<0.1	mg/L	Ganesh Ilancko KTP
SVOC-027	Atrazine	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-028	Bromacil	<0.005	mg/L	Ganesh Ilancko KTP
SVOC-031	d-BHC	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-033	Metolachlor	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-034	Metribuzin	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-035	Molinate	< 0.0010	mg/L	Ganesh Ilancko KTP
SVOC-037	Oxadiazon	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-038	Pendimethalin	<0.002	mg/L	Ganesh Ilancko KTP
SVOC-039	Propazine	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-040	Pyriproxyfen	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-041	Simazine	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-042	Terbuthylazine	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-043	Trifluralin	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-044	Hexazinone	< 0.005	mg/L	Ganesh Ilancko KTP
SVOC-045	Chlorpyrifos	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-046	Diazinon	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-047	Dimethoate	<0.001	mg/L	Ganesh Ilancko KTP
SVOC-048	Pirimiphos methyl	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-049	Acenapthene	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-050	Acenaphthylene	< 0.0010	mg/L	Ganesh Ilancko KTP
SVOC-051	Anthracene	< 0.0010	mg/L	Ganesh Ilancko KTP
SVOC-052	benz(a)anthracene	< 0.0001	mg/L	Ganesh Ilancko KTP
SVOC-053	Benzo(a)pyrene	< 0.0001	mg/L	Ganesh Ilancko KTP
SVOC-054	Total Benzo(b) and Benzo(k) fluoranthrene	< 0.0010	mg/L	Ganesh Ilancko KTP
SVOC-055	Benzo(g,h,i)perylene	<0.001	mg/L	Ganesh Ilancko KTP
SVOC-057	Chrysene	< 0.0001	mg/L	Ganesh Ilancko KTP
SVOC-058	Dibenz(a,h)anthracene	< 0.0001	mg/L	Ganesh Ilancko KTP
SVOC-059	Fluoranthene	< 0.0001	mg/L	Ganesh Ilancko KTP
SVOC-060	Fluorene	< 0.0010	mg/L	Ganesh Ilancko KTP
SVOC-061	Indeno(1,2,3-cd)pyrene	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-062	Naphthalene	0.0069	mg/L	Ganesh Ilancko KTP
SVOC-063	Phenanthrene	< 0.0010	mg/L	Ganesh Ilancko KTP
SVOC-064	Pyrene	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-066	2,2',3,4,4',5'-Hexachlorobiphenyl	<0.001	mg/L	Ganesh Ilancko KTP
SVOC-067	2,2',4,5,5'-Pentachlorobiphenyl	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-068	2,4,4'-Trichlorobiphenyl	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-069	2,4-Dichlorobiphenyl	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-070	2,2',3,4,4',5',6-Heptachlorobiphenyl	<0.0001	mg/L	Ganesh Ilancko KTP
SVOC-072	Bis(2-ethylhexyl)adipate	<0.0001	mg/L	Ganesh Ilancko KTP
VOC-001	1,2,4-Trimethylbenzene	< 0.0050	mg/L	Ganesh Ilancko KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-01	Levin Leachate Pond		09/01/2019 00:00	09/01/2019 16:19	0

Notes: 99476-0 Levin Landfill Sample

	Test	Result	Units	Signatory
VOC-002	1,3,5-Trimethylbenzene	< 0.0050	mg/L	Ganesh Ilancko KTP
VOC-003	Benzene	0.0078	mg/L	Ganesh Ilancko KTP
VOC-005	Isopropylbenzene	< 0.0050	mg/L	Ganesh Ilancko KTP
VOC-007	Naphthalene	0.0067	mg/L	Ganesh Ilancko KTP
VOC-008	n-Butylbenezene	0.0017	mg/L	Ganesh Ilancko KTP
VOC-009	n-Propylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-010	o-Xylene	0.0329	mg/L	Ganesh Ilancko KTP
VOC-011	p-Isopropyltoluene	0.0855	mg/L	Ganesh Ilancko KTP
VOC-013	sec-Butylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-014	Styrene	0.0247	mg/L	Ganesh Ilancko KTP
VOC-015	tert-Butylbenzene	0.0166	mg/L	Ganesh Ilancko KTP
VOC-016	Toluene	0.0177	mg/L	Ganesh Ilancko KTP
VOC-017	Total p,m Xylene, Ethylbenzene	0.0378	mg/L	Ganesh Ilancko KTP
VOC-018	1,1,1,2-Tetrachloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-019	1,1,1-Trichloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-020	1,1,2,2-Tetrachloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-021	1,1,2-Trichloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-022	1,1-Dichloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-023	1,1-Dichloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-024	1,1-Dichloropropene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-025	1,2,3-Trichloropropane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-026	1,2-Dibromo-3-chloropropane	<0.001	mg/L	Ganesh Ilancko KTP
VOC-027	1,2-Dibromoethane	<0.0002	mg/L	Ganesh Ilancko KTP
VOC-028	1,2-Dichloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-029	1,2-Dichloropropane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-030	1,3-Dichloropropane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-031	2,2-Dichloropropane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-032	Allyl chloride	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-033	Bromochloromethane	<0.0012	mg/L	Ganesh Ilancko KTP
VOC-034	Bromomethane	<0.001	mg/L	Ganesh Ilancko KTP
VOC-035	Carbon tetrachloride	< 0.0050	mg/L	Ganesh Ilancko KTP
VOC-036	Chloroethane	<0.001	mg/L	Ganesh Ilancko KTP
VOC-037	Chloromethane	<0.006	mg/L	Ganesh Ilancko KTP
VOC-038	cis-1,2-Dichloroethene	0.0022	mg/L	Ganesh Ilancko KTP
VOC-039	cis-1,3-Dichloropropene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-040	Dibromomethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-043	Hexachlorobutadiene	<0.0002	mg/L	Ganesh Ilancko KTP
VOC-044	Tetrachloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-045	trans-1,2-Dichloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-046	trans-1,3-Dichloropropene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-047	Trichloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-048	Trichlorofluoromethane	< 0.0050	mg/L	Ganesh Ilancko KTP
VOC-049	Vinyl Chloride	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-050	1,2,3-Trichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-051	1,2,4-Trichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-052	1,2-Dichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-053	1,3-Dichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-054	1,4-Dichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-055	2-Chlorotoluene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-056	4-Chlorotoluene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-057	Bromobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-058	Chlorobenzene	0.0020	mg/L	Ganesh Ilancko KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-01	Levin Leachate Pond		09/01/2019 00:00	09/01/2019 16:19	0

Notes: 99476-0 Levin Landfill Sample

	Test	Result	Units	Signatory
VOC-059	1,3,5-Trichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-060	4-Methyl-2-Pentanone	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-061	Carbon disulphide	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-062	Bromodichloromethane	< 0.0005	mg/L	Ganesh Ilancko KTP
VOC-063	Bromoform	< 0.0005	mg/L	Ganesh Ilancko KTP
VOC-064	Chloroform	< 0.0005	mg/L	Ganesh Ilancko KTP
VOC-065	Dibromochloromethane	< 0.0005	mg/L	Ganesh Ilancko KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-02	Levin G2s		11/01/2019 00:00	11/01/2019 14:10	0

Notes: 99475-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0001	pH	6.9		Jennifer Mont KTP
0002	Suspended Solids - Total	< 6	g/m³	Marylou Cabral KTP
0040	Total (NP) Organic Carbon	12.9	g/m³	Tracy Morrison KTP
0052	Alkalinity - Total	418	g CaCO3/m³	Jennifer Mont KTP
0055	Conductivity at 25°C	200	mS/m	Jennifer Mont KTP
0081	Chemical Oxygen Demand	148	g/m³	Gordon McArthur KTP
0085	BOD5 - Total	< 6	g/m³	Marylou Cabral KTP
0602	Chloride	376	g/m³	Shanel Kumar KTP
0605	Nitrate - Nitrogen	< 0.01	g/m³	Shanel Kumar KTP
0607	Sulphate	2.79	g/m³	Shanel Kumar KTP
0760	Ammonia Nitrogen	0.01	g/m³	Divina Lagazon KTP
1642	Total Hardness	415	g CaCO3/m³	Richard Zhao KTP
1810	Calcium - Dissolved	91.6	g/m³	Richard Zhao KTP
1819	Iron - Dissolved	0.187	g/m³	Richard Zhao KTP
1822	Magnesium - Dissolved	45.1	g/m³	Richard Zhao KTP
1834	Sodium - Dissolved	250	g/m³	Richard Zhao KTP
2088	Dissolved Reactive Phosphorus	0.013	g/m³	Divina Lagazon KTP
6701	Aluminium - Dissolved	0.003	g/m³	Shanel Kumar KTP
6703	Arsenic - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6707	Boron - Dissolved	0.95	g/m³	Shanel Kumar KTP
6708	Cadmium - Dissolved	< 0.0002	g/m³	Shanel Kumar KTP
6711	Chromium - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6713	Copper - Dissolved	0.0046	g/m³	Shanel Kumar KTP
6718	Lead - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	0.171	g/m³	Shanel Kumar KTP
6724	Nickel - Dissolved	0.0039	g/m³	Shanel Kumar KTP
6726	Potassium - Dissolved	35.0	g/m³	Sharon van Soest KTP
6738	Zinc - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
M0102	Faecal Coliforms	< 4	cfu/100ml	Juana Tamayo KTP
MO-5001	Volatile Fatty Acids	< 5 *	g/m³	Deb Bottrill (Transcribed)
MO-5002	Total Halogenated Phenolics	< 0.01	g/m³	Deb Bottrill (Transcribed)
SVOC-001	2,3-Diuron	<0.001	mg/L	Joanna Yang KTP
SVOC-002	a-BHC	<0.0001	mg/L	Joanna Yang KTP
SVOC-003	a-chlordane	<0.0001	mg/L	Joanna Yang KTP
SVOC-004	Aldrin	<0.001	mg/L	Joanna Yang KTP
SVOC-005	b-BHC	<0.0001	mg/L	Joanna Yang KTP
SVOC-006	cis-Permethrin	<0.0001	mg/L	Joanna Yang KTP
SVOC-007	Dieldrin	<0.0001	mg/L	Joanna Yang KTP
SVOC-008	Endosulfan II	<0.005	mg/L	Joanna Yang KTP
SVOC-009	Endosulfan Sulfate	<0.0001	mg/L	Joanna Yang KTP
SVOC-010	Endrin	<0.0001	mg/L	Joanna Yang KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-02	Levin G2s		11/01/2019 00:00	11/01/2019 14:10	0

Notes: 99475-0 Levin Landfill Sample

	Test	Result	Units	Signatory
SVOC-011	Endrin Aldehyde	<0.001	mg/L	Joanna Yang KTP
SVOC-013	Gamma-Chlordane	<0.001	mg/L	Joanna Yang KTP
SVOC-014	Heptachlor	<0.0001	mg/L	Joanna Yang KTP
SVOC-015	Heptachlor Epoxide	<0.0001	mg/L	Joanna Yang KTP
SVOC-016	Hexachlorobenzene	<0.0001	mg/L	Joanna Yang KTP
SVOC-017	Lindane (g-BHC)	<0.0001	mg/L	Joanna Yang KTP
SVOC-019	p,p'-DDD	<0.0001	mg/L	Joanna Yang KTP
SVOC-020	p,p'DDE	<0.0001	mg/L	Joanna Yang KTP
SVOC-021	p,p'-DDT	<0.001	mg/L	Joanna Yang KTP
SVOC-022	Procymidone	<0.0001	mg/L	Joanna Yang KTP
SVOC-023	Propanil	<0.001	mg/L	Joanna Yang KTP
SVOC-024	Endosulfan I	<0.001	mg/L	Joanna Yang KTP
SVOC-025	Alachlor	<0.0001	mg/L	Joanna Yang KTP
SVOC-026	Aldicarb	<0.1	mg/L	Joanna Yang KTP
SVOC-027	Atrazine	<0.0001	mg/L	Joanna Yang KTP
SVOC-028	Bromacil	<0.005	mg/L	Joanna Yang KTP
SVOC-029	Carbofuran	<0.001	mg/L	Joanna Yang KTP
SVOC-030	Cyanazine	<0.005	mg/L	Joanna Yang KTP
SVOC-031	d-BHC	<0.0001	mg/L	Joanna Yang KTP
SVOC-032	Metalaxyl-M	<0.001	mg/L	Joanna Yang KTP
SVOC-033	Metolachlor	<0.0001	mg/L	Joanna Yang KTP
SVOC-034	Metribuzin	<0.0001	mg/L	Joanna Yang KTP
SVOC-035	Molinate	<0.0001	mg/L	Joanna Yang KTP
SVOC-037	Oxadiazon	<0.0001	mg/L	Joanna Yang KTP
SVOC-038	Pendimethalin	<0.002	mg/L	Joanna Yang KTP
SVOC-039	Propazine	<0.0001	mg/L	Joanna Yang KTP
SVOC-040	Pyriproxyfen	<0.0001	mg/L	Joanna Yang KTP
SVOC-041	Simazine	<0.0001	mg/L	Joanna Yang KTP
SVOC-042	Terbuthylazine	<0.0001	mg/L	Joanna Yang KTP
SVOC-043	Trifluralin	<0.0001	mg/L	Joanna Yang KTP
SVOC-044	Hexazinone	<0.001	mg/L	Joanna Yang KTP
SVOC-045	Chlorpyrifos	<0.0001	mg/L	Joanna Yang KTP
SVOC-046	Diazinon	<0.0001	mg/L	Joanna Yang KTP
SVOC-047	Dimethoate	<0.001	mg/L	Joanna Yang KTP
SVOC-048	Pirimiphos methyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-049	Acenapthene	<0.0001	mg/L	Joanna Yang KTP
SVOC-050	Acenaphthylene	< 0.0010	mg/L	Joanna Yang KTP
SVOC-051	Anthracene	< 0.0010	mg/L	Joanna Yang KTP
SVOC-052	benz(a)anthracene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-053	Benzo(a)pyrene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-054	Total Benzo(b) and Benzo(k) fluoranthrene	< 0.0010	mg/L	Joanna Yang KTP
SVOC-055	Benzo(g,h,i)perylene	<0.001	mg/L	Joanna Yang KTP
SVOC-057	Chrysene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-058	Dibenz(a,h)anthracene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-059	Fluoranthene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-060	Fluorene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-061	Indeno(1,2,3-cd)pyrene	<0.0001	mg/L	Joanna Yang KTP
SVOC-062	Naphthalene	<0.0001	mg/L	Joanna Yang KTP
SVOC-063	Phenanthrene	<0.0001	mg/L	Joanna Yang KTP
SVOC-064	Pyrene	<0.0001	mg/L	Joanna Yang KTP
SVOC-066	2,2',3,4,4',5'-Hexachlorobiphenyl	<0.001	mg/L	Joanna Yang KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-02	Levin G2s		11/01/2019 00:00	11/01/2019 14:10	0

Notes: 99475-0 Levin Landfill Sample

	Test	Result	Units	Signatory
SVOC-067	2,2',4,5,5'-Pentachlorobiphenyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-068	2,4,4'-Trichlorobiphenyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-069	2,4-Dichlorobiphenyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-070	2,2',3,4,4',5',6-Heptachlorobiphenyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-072	Bis(2-ethylhexyl)adipate	< 0.0010	mg/L	Joanna Yang KTP
VOC-001	1,2,4-Trimethylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-002	1,3,5-Trimethylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-003	Benzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-005	Isopropylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-007	Naphthalene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-008	n-Butylbenezene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-009	n-Propylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-010	o-Xylene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-011	p-Isopropyltoluene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-013	sec-Butylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-014	Styrene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-015	tert-Butylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-016	Toluene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-017	Total p,m Xylene, Ethylbenzene	<0.0015	mg/L	Ganesh Ilancko KTP
VOC-018	1,1,1,2-Tetrachloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-019	1,1,1-Trichloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-020	1,1,2,2-Tetrachloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-021	1,1,2-Trichloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-022	1,1-Dichloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-023	1,1-Dichloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-024	1,1-Dichloropropene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-025	1,2,3-Trichloropropane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-026	1,2-Dibromo-3-chloropropane	<0.001	mg/L	Ganesh Ilancko KTP
VOC-027	1,2-Dibromoethane	<0.0002	mg/L	Ganesh Ilancko KTP
VOC-028	1,2-Dichloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-029	1,2-Dichloropropane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-030	1,3-Dichloropropane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-031	2,2-Dichloropropane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-032	Allyl chloride	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-033	Bromochloromethane	<0.0012	mg/L	Ganesh Ilancko KTP
VOC-034	Bromomethane	<0.001	mg/L	Ganesh Ilancko KTP
VOC-035	Carbon tetrachloride	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-036	Chloroethane	<0.001	mg/L	Ganesh Ilancko KTP
VOC-037	Chloromethane	<0.006	mg/L	Ganesh Ilancko KTP
VOC-038	cis-1,2-Dichloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-039	cis-1,3-Dichloropropene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-040	Dibromomethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-041	Dichlorodifluoromethane	<0.001	mg/L	Ganesh Ilancko KTP
VOC-043	Hexachlorobutadiene	<0.0002	mg/L	Ganesh Ilancko KTP
VOC-044	Tetrachloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-045	trans-1,2-Dichloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-046	trans-1,3-Dichloropropene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-047	Trichloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-048	Trichlorofluoromethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-049	Vinyl Chloride	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-050	1,2,3-Trichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-051	1,2,4-Trichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-02	Levin G2s		11/01/2019 00:00	11/01/2019 14:10	0

Notes: 99475-0 Levin Landfill Sample

	Test	Result	Units	Signatory
VOC-052	1,2-Dichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-053	1,3-Dichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-054	1,4-Dichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-055	2-Chlorotoluene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-056	4-Chlorotoluene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-057	Bromobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-058	Chlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-059	1,3,5-Trichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-060	4-Methyl-2-Pentanone	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-061	Carbon disulphide	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-062	Bromodichloromethane	< 0.0005	mg/L	Ganesh Ilancko KTP
VOC-063	Bromoform	< 0.0005	mg/L	Ganesh Ilancko KTP
VOC-064	Chloroform	< 0.0005	mg/L	Ganesh Ilancko KTP
VOC-065	Dibromochloromethane	< 0.0005	mg/L	Ganesh Ilancko KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-03	Levin G1S		11/01/2019 00:00	11/01/2019 14:10	0

Notes: 99440-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0001	pH	6.3		Jennifer Mont KTP
0002	Suspended Solids - Total	< 6	g/m³	Marylou Cabral KTP
0040	Total (NP) Organic Carbon	10.2	g/m³	Tracy Morrison KTP
0052	Alkalinity - Total	24	g CaCO3/m³	Jennifer Mont KTP
0055	Conductivity at 25°C	181	mS/m	Jennifer Mont KTP
0081	Chemical Oxygen Demand	93	g/m³	Gordon McArthur KTP
0085	BOD5 - Total	< 6	g/m³	Marylou Cabral KTP
0602	Chloride	513	g/m³	Shanel Kumar KTP
0605	Nitrate - Nitrogen	1.27	g/m³	Shanel Kumar KTP
0607	Sulphate	1,920	g/m³	Shanel Kumar KTP
0760	Ammonia Nitrogen	0.05	g/m³	Divina Lagazon KTP
1642	Total Hardness	373	g CaCO3/m³	Richard Zhao KTP
1810	Calcium - Dissolved	73.9	g/m³	Richard Zhao KTP
1819	Iron - Dissolved	19.3	g/m³	Richard Zhao KTP
1822	Magnesium - Dissolved	45.7	g/m³	Richard Zhao KTP
1834	Sodium - Dissolved	156	g/m³	Richard Zhao KTP
2088	Dissolved Reactive Phosphorus	0.043	g/m³	Divina Lagazon KTP
6701	Aluminium - Dissolved	0.013	g/m³	Shanel Kumar KTP
6703	Arsenic - Dissolved	0.001	g/m³	Shanel Kumar KTP
6707	Boron - Dissolved	< 0.03	g/m³	Shanel Kumar KTP
6708	Cadmium - Dissolved	0.0002	g/m³	Shanel Kumar KTP
6711	Chromium - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6713	Copper - Dissolved	0.0018	g/m³	Shanel Kumar KTP
6718	Lead - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	0.415	g/m³	Shanel Kumar KTP
6724	Nickel - Dissolved	0.0012	g/m³	Shanel Kumar KTP
6726	Potassium - Dissolved	13.2	g/m³	Shanel Kumar KTP
6738	Zinc - Dissolved	0.004	g/m³	Shanel Kumar KTP
M0102	Faecal Coliforms	< 4	cfu/100ml	Juana Tamayo KTP
MO-5001	Volatile Fatty Acids	< 5 *	g/m³	Deb Bottrill (Transcribed)
MO-5002	Total Halogenated Phenolics	< 0.01	g/m³	Deb Bottrill (Transcribed)

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-04	Levin G1D		11/01/2019 00:00	11/01/2019 14:10	0

Notes: 99441-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0001	pH	7.4		Jennifer Mont KTP
0002	Suspended Solids - Total	< 6	g/m³	Marylou Cabral KTP
0040	Total (NP) Organic Carbon	2.1	g/m³	Tracy Morrison KTP
0052	Alkalinity - Total	60	g CaCO3/m³	Jennifer Mont KTP
0055	Conductivity at 25°C	29.1	mS/m	Jennifer Mont KTP
0081	Chemical Oxygen Demand	< 15	g/m³	Gordon McArthur KTP
0085	BOD5 - Total	< 6	g/m³	Marylou Cabral KTP
0602	Chloride	33.1	g/m³	Shanel Kumar KTP
0605	Nitrate - Nitrogen	0.11	g/m³	Shanel Kumar KTP
0607	Sulphate	1,790	g/m³	Shanel Kumar KTP
0760	Ammonia Nitrogen	0.07	g/m³	Divina Lagazon KTP
1642	Total Hardness	53	g CaCO3/m³	Richard Zhao KTP
1810	Calcium - Dissolved	8.72	g/m³	Richard Zhao KTP
1819	Iron - Dissolved	2.43	g/m³	Richard Zhao KTP
1822	Magnesium - Dissolved	7.57	g/m³	Richard Zhao KTP
1834	Sodium - Dissolved	34.1	g/m³	Richard Zhao KTP
2088	Dissolved Reactive Phosphorus	0.314	g/m³	Divina Lagazon KTP
6701	Aluminium - Dissolved	0.020	g/m³	Shanel Kumar KTP
6703	Arsenic - Dissolved	0.003	g/m³	Shanel Kumar KTP
6707	Boron - Dissolved	0.04	g/m³	Shanel Kumar KTP
6708	Cadmium - Dissolved	0.0002	g/m³	Shanel Kumar KTP
6711	Chromium - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6713	Copper - Dissolved	0.0006	g/m³	Shanel Kumar KTP
6718	Lead - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	0.0654	g/m³	Shanel Kumar KTP
6724	Nickel - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6726	Potassium - Dissolved	5.77	g/m³	Shanel Kumar KTP
6738	Zinc - Dissolved	0.003	g/m³	Shanel Kumar KTP
M0102	Faecal Coliforms	< 4	cfu/100ml	Juana Tamayo KTP
MO-5001	Volatile Fatty Acids	6 *	g/m³	Deb Bottrill (Transcribed)
MO-5002	Total Halogenated Phenolics	< 0.01	g/m³	Deb Bottrill (Transcribed)

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-05	Levin F3		14/01/2019 00:00	14/01/2019 15:00	0

Notes: 99442-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0001	pH	7.2		Gordon McArthur KTP
0002	Suspended Solids - Total	6	g/m³	Gordon McArthur KTP
0040	Total (NP) Organic Carbon	1.4	g/m³	Tracy Morrison KTP
0052	Alkalinity - Total	45	g CaCO3/m³	Gordon McArthur KTP
0055	Conductivity at 25°C	20.2	mS/m	Gordon McArthur KTP
0081	Chemical Oxygen Demand	< 15	g/m³	Gordon McArthur KTP
0085	BOD5 - Total	< 1	g/m³	Gordon McArthur KTP
0602	Chloride	21.3	g/m³	Shanel Kumar KTP
0605	Nitrate - Nitrogen	0.74	g/m³	Shanel Kumar KTP
0607	Sulphate	10.7	g/m³	Shanel Kumar KTP
0760	Ammonia Nitrogen	< 0.01	g/m³	Divina Lagazon KTP
1642	Total Hardness	38	g CaCO3/m³	Richard Zhao KTP
1810	Calcium - Dissolved	5.92	g/m³	Richard Zhao KTP
1819	Iron - Dissolved	< 0.005	g/m³	Richard Zhao KTP
1822	Magnesium - Dissolved	5.70	g/m³	Richard Zhao KTP
1834	Sodium - Dissolved	24.1	g/m³	Richard Zhao KTP
2088	Dissolved Reactive Phosphorus	0.131	g/m³	Divina Lagazon KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-05	Levin F3		14/01/2019 00:00	14/01/2019 15:00	0

Notes: 99442-0 Levin Landfill Sample

	Test	Result	Units	Signatory
6701	Aluminium - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
6703	Arsenic - Dissolved	0.002	g/m³	Shanel Kumar KTP
6707	Boron - Dissolved	< 0.03	g/m³	Shanel Kumar KTP
6708	Cadmium - Dissolved	< 0.0002	g/m³	Shanel Kumar KTP
6711	Chromium - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6713	Copper - Dissolved	0.0006	g/m³	Shanel Kumar KTP
6718	Lead - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6724	Nickel - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6726	Potassium - Dissolved	4.95	g/m³	Shanel Kumar KTP
6738	Zinc - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
M0102	Faecal Coliforms	< 4	cfu/100ml	Yuemei Yu KTP
MO-5001	Volatile Fatty Acids	6 *	g/m³	Deb Bottrill (Transcribed)
MO-5002	Total Halogenated Phenolics	< 0.01	g/m³	Deb Bottrill (Transcribed)

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-06	Levin F2		14/01/2019 00:00	14/01/2019 15:00	0

Notes: 99443-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0001	pH	7.2		Gordon McArthur KTP
0002	Suspended Solids - Total	< 6	g/m³	Gordon McArthur KTP
0040	Total (NP) Organic Carbon	1.5	g/m³	Tracy Morrison KTP
0052	Alkalinity - Total	53	g CaCO3/m³	Gordon McArthur KTP
0055	Conductivity at 25°C	22.5	mS/m	Gordon McArthur KTP
0081	Chemical Oxygen Demand	< 15	g/m³	Gordon McArthur KTP
0085	BOD5 - Total	< 1	g/m³	Gordon McArthur KTP
0602	Chloride	24.2	g/m³	Shanel Kumar KTP
0605	Nitrate - Nitrogen	0.66	g/m³	Shanel Kumar KTP
0607	Sulphate	9.42	g/m³	Shanel Kumar KTP
0760	Ammonia Nitrogen	< 0.01	g/m³	Divina Lagazon KTP
1642	Total Hardness	39	g CaCO3/m³	Richard Zhao KTP
1810	Calcium - Dissolved	6.40	g/m³	Richard Zhao KTP
1819	Iron - Dissolved	0.020	g/m³	Richard Zhao KTP
1822	Magnesium - Dissolved	5.64	g/m³	Richard Zhao KTP
1834	Sodium - Dissolved	28.1	g/m³	Richard Zhao KTP
2088	Dissolved Reactive Phosphorus	0.142	g/m³	Divina Lagazon KTP
6701	Aluminium - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
6703	Arsenic - Dissolved	0.002	g/m³	Shanel Kumar KTP
6707	Boron - Dissolved	0.04	g/m³	Shanel Kumar KTP
6708	Cadmium - Dissolved	< 0.0002	g/m³	Shanel Kumar KTP
6711	Chromium - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6713	Copper - Dissolved	0.0010	g/m³	Shanel Kumar KTP
6718	Lead - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	0.0075	g/m³	Shanel Kumar KTP
6724	Nickel - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6726	Potassium - Dissolved	5.21	g/m³	Shanel Kumar KTP
6738	Zinc - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
M0102	Faecal Coliforms	< 4	cfu/100ml	Yuemei Yu KTP
MO-5001	Volatile Fatty Acids	6 *	g/m³	Deb Bottrill (Transcribed)
MO-5002	Total Halogenated Phenolics	< 0.01	g/m³	Deb Bottrill (Transcribed)

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-07	Levin F1		14/01/2019 00:00	14/01/2019 15:00	0

Notes: 99444-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0001	pH	7.2		Gordon McArthur KTP
0002	Suspended Solids - Total	< 6	g/m³	Gordon McArthur KTP
0040	Total (NP) Organic Carbon	5.4	g/m³	Tracy Morrison KTP
0052	Alkalinity - Total	130	g CaCO3/m³	Gordon McArthur KTP
0055	Conductivity at 25°C	48.0	mS/m	Gordon McArthur KTP
0081	Chemical Oxygen Demand	< 15	g/m³	Gordon McArthur KTP
0085	BOD5 - Total	< 1	g/m³	Gordon McArthur KTP
0602	Chloride	57.6	g/m³	Shanel Kumar KTP
0605	Nitrate - Nitrogen	1.31	g/m³	Shanel Kumar KTP
0607	Sulphate	4.32	g/m³	Shanel Kumar KTP
0760	Ammonia Nitrogen	< 0.01	g/m³	Divina Lagazon KTP
1642	Total Hardness	128	g CaCO3/m³	Richard Zhao KTP
1810	Calcium - Dissolved	19.7	g/m³	Richard Zhao KTP
1819	Iron - Dissolved	< 0.005	g/m³	Richard Zhao KTP
1822	Magnesium - Dissolved	19.1	g/m³	Richard Zhao KTP
1834	Sodium - Dissolved	46.4	g/m³	Richard Zhao KTP
2088	Dissolved Reactive Phosphorus	0.160	g/m³	Divina Lagazon KTP
6701	Aluminium - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
6703	Arsenic - Dissolved	0.002	g/m³	Shanel Kumar KTP
6707	Boron - Dissolved	< 0.03	g/m³	Shanel Kumar KTP
6708	Cadmium - Dissolved	< 0.0002	g/m³	Shanel Kumar KTP
6711	Chromium - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6713	Copper - Dissolved	0.0018	g/m³	Shanel Kumar KTP
6718	Lead - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	0.0029	g/m³	Shanel Kumar KTP
6724	Nickel - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6726	Potassium - Dissolved	7.90	g/m³	Shanel Kumar KTP
6738	Zinc - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
M0102	Faecal Coliforms	< 4	cfu/100ml	Yuemei Yu KTP
MO-5001	Volatile Fatty Acids	< 5 *	g/m³	Deb Bottrill (Transcribed)
MO-5002	Total Halogenated Phenolics	< 0.01	g/m³	Deb Bottrill (Transcribed)

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-08	Levin E2s		15/01/2019 00:00	16/01/2019 09:39	0

Notes: 99445-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0001	pH	7.4		Jennifer Mont KTP
0002	Suspended Solids - Total	< 6	g/m³	Marylou Cabral KTP
0040	Total (NP) Organic Carbon	3.1	g/m³	Tracy Morrison KTP
0052	Alkalinity - Total	150	g CaCO3/m³	Jennifer Mont KTP
0055	Conductivity at 25°C	44.5	mS/m	Jennifer Mont KTP
0081	Chemical Oxygen Demand	< 15	g/m³	Gordon McArthur KTP
0085	BOD5 - Total	< 3	g/m³	Gordon McArthur KTP
0602	Chloride	42.1	g/m³	Shanel Kumar KTP
0605	Nitrate - Nitrogen	< 0.01	g/m³	Shanel Kumar KTP
0607	Sulphate	7.54	g/m³	Shanel Kumar KTP
0760	Ammonia Nitrogen	0.25	g/m³	Divina Lagazon KTP
1642	Total Hardness	120	g CaCO3/m³	Richard Zhao KTP
1810	Calcium - Dissolved	26.5	g/m³	Richard Zhao KTP
1819	Iron - Dissolved	0.070	g/m³	Richard Zhao KTP
1822	Magnesium - Dissolved	12.9	g/m³	Richard Zhao KTP
1834	Sodium - Dissolved	44.1	g/m³	Richard Zhao KTP
2088	Dissolved Reactive Phosphorus	0.576	g/m³	Divina Lagazon KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-08	Levin E2s		15/01/2019 00:00	16/01/2019 09:39	0

Notes: 99445-0 Levin Landfill Sample

	Test	Result	Units	Signatory
6701	Aluminium - Dissolved	0.003	g/m³	Shanel Kumar KTP
6703	Arsenic - Dissolved	0.002	g/m³	Shanel Kumar KTP
6707	Boron - Dissolved	0.05	g/m³	Shanel Kumar KTP
6708	Cadmium - Dissolved	< 0.0002	g/m³	Shanel Kumar KTP
6711	Chromium - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6713	Copper - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6718	Lead - Dissolved	0.0015	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	0.380	g/m³	Shanel Kumar KTP
6724	Nickel - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6726	Potassium - Dissolved	5.93	g/m³	Shanel Kumar KTP
6738	Zinc - Dissolved	0.011	g/m³	Shanel Kumar KTP
M0102	Faecal Coliforms	< 4	cfu/100ml	Maria Norris KTP
MO-5001	Volatile Fatty Acids	6 *	g/m³	Lizzie Addis (Transcription)
MO-5002	Total Halogenated Phenolics	< 0.05	g/m³	Prashilla Singh (Transcribed)

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-09	Levin E2d		14/01/2019 00:00	15/01/2019 10:47	0

Notes: 99446-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0001	pH	7.7		Gordon McArthur KTP
0002	Suspended Solids - Total	11	g/m³	Marylou Cabral KTP
0040	Total (NP) Organic Carbon	2.1	g/m³	Tracy Morrison KTP
0052	Alkalinity - Total	82	g CaCO3/m³	Gordon McArthur KTP
0055	Conductivity at 25°C	36.7	mS/m	Gordon McArthur KTP
0081	Chemical Oxygen Demand	30	g/m³	Gordon McArthur KTP
0085	BOD5 - Total	< 1	g/m³	Gordon McArthur KTP
0602	Chloride	50.5	g/m³	Shanel Kumar KTP
0605	Nitrate - Nitrogen	< 0.01	g/m³	Shanel Kumar KTP
0607	Sulphate	10.7	g/m³	Shanel Kumar KTP
0760	Ammonia Nitrogen	0.34	g/m³	Divina Lagazon KTP
1642	Total Hardness	101	g CaCO3/m³	Richard Zhao KTP
1810	Calcium - Dissolved	29.7	g/m³	Richard Zhao KTP
1819	Iron - Dissolved	0.064	g/m³	Richard Zhao KTP
1822	Magnesium - Dissolved	6.46	g/m³	Richard Zhao KTP
1834	Sodium - Dissolved	31.0	g/m³	Richard Zhao KTP
2088	Dissolved Reactive Phosphorus	0.218	g/m³	Divina Lagazon KTP
6701	Aluminium - Dissolved	0.003	g/m³	Shanel Kumar KTP
6703	Arsenic - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6707	Boron - Dissolved	< 0.03	g/m³	Shanel Kumar KTP
6708	Cadmium - Dissolved	< 0.0002	g/m³	Shanel Kumar KTP
6711	Chromium - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6713	Copper - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6718	Lead - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	0.231	g/m³	Shanel Kumar KTP
6724	Nickel - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6726	Potassium - Dissolved	5.11	g/m³	Shanel Kumar KTP
6738	Zinc - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
M0102	Faecal Coliforms	< 4	cfu/100ml	Juana Tamayo KTP
MO-5001	Volatile Fatty Acids	< 5 *	g/m³	Chen Lin (Transcription)
MO-5002	Total Halogenated Phenolics	< 0.05	g/m³	Prashilla Singh (Transcribed)

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-10	Levin E1s		15/01/2019 00:00	16/01/2019 09:39	0

Notes: 99447-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0001	pH	7.3		Jennifer Mont KTP
0002	Suspended Solids - Total	< 6	g/m³	Marylou Cabral KTP
0040	Total (NP) Organic Carbon	3.7	g/m³	Tracy Morrison KTP
0052	Alkalinity - Total	58	g CaCO3/m³	Jennifer Mont KTP
0055	Conductivity at 25°C	26.4	mS/m	Jennifer Mont KTP
0081	Chemical Oxygen Demand	< 15	g/m³	Gordon McArthur KTP
0085	BOD5 - Total	< 3	g/m³	Gordon McArthur KTP
0602	Chloride	33.6	g/m³	Shanel Kumar KTP
0605	Nitrate - Nitrogen	0.01	g/m³	Shanel Kumar KTP
0607	Sulphate	11.4	g/m³	Shanel Kumar KTP
0760	Ammonia Nitrogen	0.16	g/m³	Divina Lagazon KTP
1642	Total Hardness	52	g CaCO3/m³	Richard Zhao KTP
1810	Calcium - Dissolved	9.19	g/m³	Richard Zhao KTP
1819	Iron - Dissolved	4.22	g/m³	Richard Zhao KTP
1822	Magnesium - Dissolved	7.14	g/m³	Richard Zhao KTP
1834	Sodium - Dissolved	29.3	g/m³	Richard Zhao KTP
2088	Dissolved Reactive Phosphorus	0.065	g/m³	Divina Lagazon KTP
6701	Aluminium - Dissolved	0.006	g/m³	Shanel Kumar KTP
6703	Arsenic - Dissolved	0.002	g/m³	Shanel Kumar KTP
6707	Boron - Dissolved	< 0.03	g/m³	Shanel Kumar KTP
6708	Cadmium - Dissolved	< 0.0002	g/m³	Shanel Kumar KTP
6711	Chromium - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6713	Copper - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6718	Lead - Dissolved	0.0006	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	0.219	g/m³	Shanel Kumar KTP
6724	Nickel - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6726	Potassium - Dissolved	6.01	g/m³	Shanel Kumar KTP
6738	Zinc - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
M0102	Faecal Coliforms	< 4	cfu/100ml	Maria Norris KTP
MO-5001	Volatile Fatty Acids	< 5 *	g/m³	Lizzie Addis (Transcription)
MO-5002	Total Halogenated Phenolics	< 0.05	g/m³	Prashilla Singh (Transcribed)

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-11	Levin E1d		14/01/2019 00:00	15/01/2019 10:47	0

Notes: 99448-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0001	pH	7.5		Gordon McArthur KTP
0002	Suspended Solids - Total	27	g/m³	Marylou Cabral KTP
0040	Total (NP) Organic Carbon	3.2	g/m³	Tracy Morrison KTP
0052	Alkalinity - Total	161	g CaCO3/m³	Gordon McArthur KTP
0055	Conductivity at 25°C	45.6	mS/m	Gordon McArthur KTP
0081	Chemical Oxygen Demand	37	g/m³	Gordon McArthur KTP
0085	BOD5 - Total	< 1	g/m³	Gordon McArthur KTP
0602	Chloride	39.0	g/m³	Shanel Kumar KTP
0605	Nitrate - Nitrogen	< 0.01	g/m³	Shanel Kumar KTP
0607	Sulphate	< 0.02	g/m³	Shanel Kumar KTP
0760	Ammonia Nitrogen	0.20	g/m³	Divina Lagazon KTP
1642	Total Hardness	141	g CaCO3/m³	Richard Zhao KTP
1810	Calcium - Dissolved	34.7	g/m³	Richard Zhao KTP
1819	Iron - Dissolved	0.036	g/m³	Richard Zhao KTP
1822	Magnesium - Dissolved	13.1	g/m³	Richard Zhao KTP
1834	Sodium - Dissolved	39.6	g/m³	Richard Zhao KTP
2088	Dissolved Reactive Phosphorus	0.395	g/m³	Divina Lagazon KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-11	Levin E1d		14/01/2019 00:00	15/01/2019 10:47	0

Notes: 99448-0 Levin Landfill Sample

	Test	Result	Units	Signatory
6701	Aluminium - Dissolved	0.003	g/m³	Shanel Kumar KTP
6703	Arsenic - Dissolved	0.008	g/m³	Shanel Kumar KTP
6707	Boron - Dissolved	0.05	g/m³	Shanel Kumar KTP
6708	Cadmium - Dissolved	< 0.0002	g/m³	Shanel Kumar KTP
6711	Chromium - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6713	Copper - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6718	Lead - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	0.229	g/m³	Shanel Kumar KTP
6724	Nickel - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6726	Potassium - Dissolved	4.96	g/m³	Shanel Kumar KTP
6738	Zinc - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
M0102	Faecal Coliforms	< 4	cfu/100ml	Juana Tamayo KTP
MO-5001	Volatile Fatty Acids	< 5 *	g/m³	Chen Lin (Transcription)
MO-5002	Total Halogenated Phenolics	< 0.05	g/m³	Prashilla Singh (Transcribed)

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-12	Levin D6		15/01/2019 00:00	15/01/2019 15:09	0

Notes: 99449-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0001	pH	6.8		Jennifer Mont KTP
0002	Suspended Solids - Total	< 6	g/m³	Marylou Cabral KTP
0040	Total (NP) Organic Carbon	1.0	g/m³	Tracy Morrison KTP
0052	Alkalinity - Total	73	g CaCO3/m³	Jennifer Mont KTP
0055	Conductivity at 25°C	44.5	mS/m	Jennifer Mont KTP
0081	Chemical Oxygen Demand	< 15	g/m³	Gordon McArthur KTP
0085	BOD5 - Total	< 3	g/m³	Gordon McArthur KTP
0602	Chloride	26.2	g/m³	Shanel Kumar KTP
0605	Nitrate - Nitrogen	22.9	g/m³	Shanel Kumar KTP
0607	Sulphate	4.85	g/m³	Shanel Kumar KTP
0760	Ammonia Nitrogen	< 0.01	g/m³	Divina Lagazon KTP
1642	Total Hardness	101	g CaCO3/m³	Richard Zhao KTP
1810	Calcium - Dissolved	18.5	g/m³	Richard Zhao KTP
1819	Iron - Dissolved	< 0.005	g/m³	Richard Zhao KTP
1822	Magnesium - Dissolved	13.2	g/m³	Richard Zhao KTP
1834	Sodium - Dissolved	38.4	g/m³	Richard Zhao KTP
2088	Dissolved Reactive Phosphorus	0.094	g/m³	Divina Lagazon KTP
6701	Aluminium - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
6703	Arsenic - Dissolved	0.001	g/m³	Shanel Kumar KTP
6707	Boron - Dissolved	0.07	g/m³	Shanel Kumar KTP
6708	Cadmium - Dissolved	< 0.0002	g/m³	Shanel Kumar KTP
6711	Chromium - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6713	Copper - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6718	Lead - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6724	Nickel - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6726	Potassium - Dissolved	8.67	g/m³	Shanel Kumar KTP
6738	Zinc - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
M0102	Faecal Coliforms	< 4	cfu/100ml	Juana Tamayo KTP
MO-5001	Volatile Fatty Acids	< 5 *	g/m³	Chen Lin (Transcription)
MO-5002	Total Halogenated Phenolics	< 0.05	g/m³	Prashilla Singh (Transcribed)

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-13	Levin D5		14/01/2019 00:00	14/01/2019 15:00	0

Notes: 99450-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0001	pH	7.4		Gordon McArthur KTP
0002	Suspended Solids - Total	< 6	g/m³	Marylou Cabral KTP
0040	Total (NP) Organic Carbon	2.1	g/m³	Tracy Morrison KTP
0052	Alkalinity - Total	67	g CaCO3/m³	Gordon McArthur KTP
0055	Conductivity at 25°C	31.8	mS/m	Gordon McArthur KTP
0081	Chemical Oxygen Demand	21	g/m³	Gordon McArthur KTP
0085	BOD5 - Total	< 1	g/m³	Gordon McArthur KTP
0602	Chloride	31.5	g/m³	Shanel Kumar KTP
0605	Nitrate - Nitrogen	0.86	g/m³	Shanel Kumar KTP
0607	Sulphate	28.3	g/m³	Shanel Kumar KTP
0760	Ammonia Nitrogen	0.01	g/m³	Divina Lagazon KTP
1642	Total Hardness	72	g CaCO3/m³	Richard Zhao KTP
1810	Calcium - Dissolved	12.7	g/m³	Richard Zhao KTP
1819	Iron - Dissolved	0.113	g/m³	Richard Zhao KTP
1822	Magnesium - Dissolved	9.72	g/m³	Richard Zhao KTP
1834	Sodium - Dissolved	33.1	g/m³	Richard Zhao KTP
2088	Dissolved Reactive Phosphorus	0.084	g/m³	Divina Lagazon KTP
6701	Aluminium - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
6703	Arsenic - Dissolved	0.001	g/m³	Shanel Kumar KTP
6707	Boron - Dissolved	< 0.03	g/m³	Shanel Kumar KTP
6708	Cadmium - Dissolved	< 0.0002	g/m³	Shanel Kumar KTP
6711	Chromium - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6713	Copper - Dissolved	0.0005	g/m³	Shanel Kumar KTP
6718	Lead - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	0.0203	g/m³	Shanel Kumar KTP
6724	Nickel - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6726	Potassium - Dissolved	7.36	g/m³	Shanel Kumar KTP
6738	Zinc - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
M0102	Faecal Coliforms	< 4	cfu/100ml	Yuemei Yu KTP
MO-5001	Volatile Fatty Acids	< 5 *	g/m³	Deb Bottrill (Transcribed)
MO-5002	Total Halogenated Phenolics	< 0.01	g/m³	Deb Bottrill (Transcribed)

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-14	Levin D4		15/01/2019 00:00	16/01/2019 09:39	0

Notes: 99451-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0001	pH	7.0		Jennifer Mont KTP
0002	Suspended Solids - Total	< 6	g/m³	Marylou Cabral KTP
0040	Total (NP) Organic Carbon	1.9	g/m³	Tracy Morrison KTP
0052	Alkalinity - Total	52	g CaCO3/m³	Jennifer Mont KTP
0055	Conductivity at 25°C	29.7	mS/m	Jennifer Mont KTP
0081	Chemical Oxygen Demand	< 15	g/m³	Gordon McArthur KTP
0085	BOD5 - Total	< 3	g/m³	Gordon McArthur KTP
0602	Chloride	44.6	g/m³	Shanel Kumar KTP
0605	Nitrate - Nitrogen	< 0.01	g/m³	Shanel Kumar KTP
0607	Sulphate	14.9	g/m³	Shanel Kumar KTP
0760	Ammonia Nitrogen	0.22	g/m³	Divina Lagazon KTP
1642	Total Hardness	54	g CaCO3/m³	Richard Zhao KTP
1810	Calcium - Dissolved	9.61	g/m³	Richard Zhao KTP
1819	Iron - Dissolved	0.833	g/m³	Richard Zhao KTP
1822	Magnesium - Dissolved	7.17	g/m³	Richard Zhao KTP
1834	Sodium - Dissolved	32.8	g/m³	Richard Zhao KTP
2088	Dissolved Reactive Phosphorus	0.023	g/m³	Divina Lagazon KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-14	Levin D4		15/01/2019 00:00	16/01/2019 09:39	0

Notes: 99451-0 Levin Landfill Sample

	Test	Result	Units	Signatory
6701	Aluminium - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
6703	Arsenic - Dissolved	0.003	g/m³	Shanel Kumar KTP
6707	Boron - Dissolved	< 0.03	g/m³	Shanel Kumar KTP
6708	Cadmium - Dissolved	< 0.0002	g/m³	Shanel Kumar KTP
6711	Chromium - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6713	Copper - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6718	Lead - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	0.175	g/m³	Shanel Kumar KTP
6724	Nickel - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6726	Potassium - Dissolved	6.06	g/m³	Shanel Kumar KTP
6738	Zinc - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
M0102	Faecal Coliforms	< 4	cfu/100ml	Maria Norris KTP
MO-5001	Volatile Fatty Acids	< 5 *	g/m³	Lizzie Addis (Transcription)
MO-5002	Total Halogenated Phenolics	< 0.05	g/m³	Prashilla Singh (Transcribed)

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-15	Levin D3r		15/01/2019 00:00	15/01/2019 15:09	0

Notes: 99452-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0001	pH	6.8		Jennifer Mont KTP
0002	Suspended Solids - Total	8	g/m³	Marylou Cabral KTP
0040	Total (NP) Organic Carbon	2.6	g/m³	Tracy Morrison KTP
0052	Alkalinity - Total	57	g CaCO3/m³	Jennifer Mont KTP
0055	Conductivity at 25°C	22.1	mS/m	Jennifer Mont KTP
0081	Chemical Oxygen Demand	< 15	g/m³	Gordon McArthur KTP
0085	BOD5 - Total	< 3	g/m³	Gordon McArthur KTP
0602	Chloride	22.4	g/m³	Shanel Kumar KTP
0605	Nitrate - Nitrogen	0.20	g/m³	Shanel Kumar KTP
0607	Sulphate	7.68	g/m³	Shanel Kumar KTP
0760	Ammonia Nitrogen	0.17	g/m³	Divina Lagazon KTP
1642	Total Hardness	36	g CaCO3/m³	Richard Zhao KTP
1810	Calcium - Dissolved	6.99	g/m³	Richard Zhao KTP
1819	Iron - Dissolved	2.47	g/m³	Richard Zhao KTP
1822	Magnesium - Dissolved	4.49	g/m³	Richard Zhao KTP
1834	Sodium - Dissolved	25.9	g/m³	Richard Zhao KTP
2088	Dissolved Reactive Phosphorus	0.013	g/m³	Divina Lagazon KTP
6701	Aluminium - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
6703	Arsenic - Dissolved	0.007	g/m³	Shanel Kumar KTP
6707	Boron - Dissolved	0.03	g/m³	Shanel Kumar KTP
6708	Cadmium - Dissolved	< 0.0002	g/m³	Shanel Kumar KTP
6711	Chromium - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6713	Copper - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6718	Lead - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	0.189	g/m³	Shanel Kumar KTP
6724	Nickel - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6726	Potassium - Dissolved	5.30	g/m³	Shanel Kumar KTP
6738	Zinc - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
M0102	Faecal Coliforms	< 4	cfu/100ml	Juana Tamayo KTP
MO-5001	Volatile Fatty Acids	6 *	g/m³	Chen Lin (Transcription)
MO-5002	Total Halogenated Phenolics	< 0.05	g/m³	Prashilla Singh (Transcribed)

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-16	Levin D2		15/01/2019 00:00	15/01/2019 15:09	0

Notes: 99453-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0001	pH	6.4		Jennifer Mont KTP
0002	Suspended Solids - Total	7	g/m³	Marylou Cabral KTP
0040	Total (NP) Organic Carbon	13.7	g/m³	Tracy Morrison KTP
0052	Alkalinity - Total	101	g CaCO3/m³	Jennifer Mont KTP
0055	Conductivity at 25°C	35.4	mS/m	Jennifer Mont KTP
0081	Chemical Oxygen Demand	37	g/m³	Gordon McArthur KTP
0085	BOD5 - Total	< 6	g/m³	Gordon McArthur KTP
0602	Chloride	41.3	g/m³	Shanel Kumar KTP
0605	Nitrate - Nitrogen	< 0.01	g/m³	Shanel Kumar KTP
0607	Sulphate	1.58	g/m³	Shanel Kumar KTP
0760	Ammonia Nitrogen	0.45	g/m³	Divina Lagazon KTP
1642	Total Hardness	89	g CaCO3/m³	Richard Zhao KTP
1810	Calcium - Dissolved	15.2	g/m³	Richard Zhao KTP
1819	Iron - Dissolved	8.22	g/m³	Richard Zhao KTP
1822	Magnesium - Dissolved	12.3	g/m³	Richard Zhao KTP
1834	Sodium - Dissolved	29.3	g/m³	Richard Zhao KTP
2088	Dissolved Reactive Phosphorus	0.032	g/m³	Divina Lagazon KTP
6701	Aluminium - Dissolved	0.012	g/m³	Shanel Kumar KTP
6703	Arsenic - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6707	Boron - Dissolved	0.03	g/m³	Shanel Kumar KTP
6708	Cadmium - Dissolved	< 0.0002	g/m³	Shanel Kumar KTP
6711	Chromium - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6713	Copper - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6718	Lead - Dissolved	0.0006	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	0.300	g/m³	Shanel Kumar KTP
6724	Nickel - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6726	Potassium - Dissolved	6.69	g/m³	Shanel Kumar KTP
6738	Zinc - Dissolved	0.007	g/m³	Shanel Kumar KTP
M0102	Faecal Coliforms	8	cfu/100ml	Juana Tamayo KTP
MO-5001	Volatile Fatty Acids	6 *	g/m³	Chen Lin (Transcription)
MO-5002	Total Halogenated Phenolics	< 0.05	g/m³	Prashilla Singh (Transcribed)

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-17	Levin D1		15/01/2019 00:00	15/01/2019 15:09	0

Notes: 99467-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0001	pH	6.8		Jennifer Mont KTP
0002	Suspended Solids - Total	< 6	g/m³	Marylou Cabral KTP
0040	Total (NP) Organic Carbon	1.4	g/m³	Tracy Morrison KTP
0052	Alkalinity - Total	151	g CaCO3/m³	Jennifer Mont KTP
0055	Conductivity at 25°C	58.2	mS/m	Jennifer Mont KTP
0081	Chemical Oxygen Demand	< 15	g/m³	Gordon McArthur KTP
0085	BOD5 - Total	< 3	g/m³	Gordon McArthur KTP
0602	Chloride	36.9	g/m³	Shanel Kumar KTP
0605	Nitrate - Nitrogen	16.7	g/m³	Shanel Kumar KTP
0607	Sulphate	6.44	g/m³	Shanel Kumar KTP
0760	Ammonia Nitrogen	< 0.01	g/m³	Divina Lagazon KTP
1642	Total Hardness	153	g CaCO3/m³	Richard Zhao KTP
1810	Calcium - Dissolved	29.1	g/m³	Richard Zhao KTP
1819	Iron - Dissolved	0.015	g/m³	Richard Zhao KTP
1822	Magnesium - Dissolved	19.5	g/m³	Richard Zhao KTP
1834	Sodium - Dissolved	54.2	g/m³	Richard Zhao KTP
2088	Dissolved Reactive Phosphorus	0.084	g/m³	Divina Lagazon KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-17	Levin D1		15/01/2019 00:00	15/01/2019 15:09	0

Notes: 99467-0 Levin Landfill Sample

	Test	Result	Units	Signatory
6701	Aluminium - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
6703	Arsenic - Dissolved	0.001	g/m³	Shanel Kumar KTP
6707	Boron - Dissolved	0.05	g/m³	Shanel Kumar KTP
6708	Cadmium - Dissolved	0.0002	g/m³	Shanel Kumar KTP
6711	Chromium - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6713	Copper - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6718	Lead - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6724	Nickel - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6726	Potassium - Dissolved	10.2	g/m³	Shanel Kumar KTP
6738	Zinc - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
M0102	Faecal Coliforms	< 4	cfu/100ml	Juana Tamayo KTP
MO-5001	Volatile Fatty Acids	6 *	g/m³	Chen Lin (Transcription)
MO-5002	Total Halogenated Phenolics	< 0.05	g/m³	Prashilla Singh (Transcribed)

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-18	Levin C2ds		16/01/2019 00:00	16/01/2019 16:26	0

Notes: 99474-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0001	pH	6.8		Jennifer Mont KTP
0002	Suspended Solids - Total	56	g/m³	Gordon McArthur KTP
0040	Total (NP) Organic Carbon	30.8	g/m³	Sharon van Soest KTP
0052	Alkalinity - Total	758	g CaCO3/m³	Jennifer Mont KTP
0055	Conductivity at 25°C	173	mS/m	Jennifer Mont KTP
0081	Chemical Oxygen Demand	77	g/m³	Gordon McArthur KTP
0085	BOD5 - Total	< 6	g/m³	Gordon McArthur KTP
0602	Chloride	109	g/m³	Shanel Kumar KTP
0605	Nitrate - Nitrogen	< 0.01	g/m³	Shanel Kumar KTP
0607	Sulphate	0.03	g/m³	Shanel Kumar KTP
0760	Ammonia Nitrogen	1.57	g/m³	Divina Lagazon KTP
1642	Total Hardness	606	g CaCO3/m³	Shanel Kumar KTP
1810	Calcium - Dissolved	144	g/m³	Shanel Kumar KTP
1819	Iron - Dissolved	19.1	g/m³	Shanel Kumar KTP
1822	Magnesium - Dissolved	59.9	g/m³	Shanel Kumar KTP
1834	Sodium - Dissolved	113	g/m³	Shanel Kumar KTP
2088	Dissolved Reactive Phosphorus	0.029	g/m³	Divina Lagazon KTP
6701	Aluminium - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
6703	Arsenic - Dissolved	0.002	g/m³	Shanel Kumar KTP
6707	Boron - Dissolved	0.86	g/m³	Shanel Kumar KTP
6708	Cadmium - Dissolved	< 0.0002	g/m³	Shanel Kumar KTP
6711	Chromium - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6713	Copper - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6718	Lead - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	2.87	g/m³	Shanel Kumar KTP
6724	Nickel - Dissolved	0.0023	g/m³	Shanel Kumar KTP
6726	Potassium - Dissolved	15.6	g/m³	Sharon van Soest KTP
6738	Zinc - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
M0102	Faecal Coliforms	< 4	cfu/100ml	Maria Norris KTP
MO-5001	Volatile Fatty Acids	< 5 *	g/m³	Lizzie Addis (Transcription)
MO-5002	Total Halogenated Phenolics	< 0.05	g/m³	Prashilla Singh (Transcribed)
SVOC-001	2,3-Diuron	<0.001	mg/L	Joanna Yang KTP
SVOC-002	a-BHC	<0.0001	mg/L	Joanna Yang KTP
SVOC-003	a-chlordane	<0.0001	mg/L	Joanna Yang KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-18	Levin C2ds		16/01/2019 00:00	16/01/2019 16:26	0

Notes: 99474-0 Levin Landfill Sample

	Test	Result	Units	Signatory
SVOC-004	Aldrin	<0.001	mg/L	Joanna Yang KTP
SVOC-005	b-BHC	<0.0001	mg/L	Joanna Yang KTP
SVOC-006	cis-Permethrin	<0.0001	mg/L	Joanna Yang KTP
SVOC-007	Dieldrin	<0.0001	mg/L	Joanna Yang KTP
SVOC-008	Endosulfan II	<0.005	mg/L	Joanna Yang KTP
SVOC-009	Endosulfan Sulfate	<0.0001	mg/L	Joanna Yang KTP
SVOC-010	Endrin	<0.0001	mg/L	Joanna Yang KTP
SVOC-011	Endrin Aldehyde	<0.001	mg/L	Joanna Yang KTP
SVOC-013	Gamma-Chlordane	<0.001	mg/L	Joanna Yang KTP
SVOC-015	Heptachlor Epoxide	<0.0001	mg/L	Joanna Yang KTP
SVOC-016	Hexachlorobenzene	<0.0001	mg/L	Joanna Yang KTP
SVOC-017	Lindane (g-BHC)	<0.0001	mg/L	Joanna Yang KTP
SVOC-019	p,p'-DDD	<0.0001	mg/L	Joanna Yang KTP
SVOC-020	p,p'DDE	<0.0001	mg/L	Joanna Yang KTP
SVOC-021	p,p'-DDT	< 0.001	mg/L	Joanna Yang KTP
SVOC-022	Procymidone	<0.0001	mg/L	Joanna Yang KTP
SVOC-023	Propanil	<0.001	mg/L	Joanna Yang KTP
SVOC-024	Endosulfan I	<0.001	mg/L	Joanna Yang KTP
SVOC-025	Alachlor	<0.0001	mg/L	Joanna Yang KTP
SVOC-026	Aldicarb	<0.1	mg/L	Joanna Yang KTP
SVOC-027	Atrazine	<0.0001	mg/L	Joanna Yang KTP
SVOC-028	Bromacil	<0.005	mg/L	Joanna Yang KTP
SVOC-030	Cyanazine	<0.005	mg/L	Joanna Yang KTP
SVOC-031	d-BHC	<0.0001	mg/L	Joanna Yang KTP
SVOC-032	Metalaxyl-M	<0.001	mg/L	Joanna Yang KTP
SVOC-033	Metolachlor	<0.0001	mg/L	Joanna Yang KTP
SVOC-034	Metribuzin	<0.0001	mg/L	Joanna Yang KTP
SVOC-035	Molinate	<0.0001	mg/L	Joanna Yang KTP
SVOC-037	Oxadiazon	<0.0001	mg/L	Joanna Yang KTP
SVOC-038	Pendimethalin	<0.002	mg/L	Joanna Yang KTP
SVOC-039	Propazine	<0.0001	mg/L	Joanna Yang KTP
SVOC-040	Pyriproxyfen	<0.0001	mg/L	Joanna Yang KTP
SVOC-041	Simazine	<0.0001	mg/L	Joanna Yang KTP
SVOC-042	Terbuthylazine	<0.0001	mg/L	Joanna Yang KTP
SVOC-043	Trifluralin	<0.0001	mg/L	Joanna Yang KTP
SVOC-045	Chlorpyrifos	<0.0001	mg/L	Joanna Yang KTP
SVOC-046	Diazinon	<0.0001	mg/L	Joanna Yang KTP
SVOC-047	Dimethoate	<0.001	mg/L	Joanna Yang KTP
SVOC-048	Pirimiphos methyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-049	Acenapthene	<0.0001	mg/L	Joanna Yang KTP
SVOC-050	Acenaphthylene	< 0.0010	mg/L	Joanna Yang KTP
SVOC-051	Anthracene	< 0.0010	mg/L	Joanna Yang KTP
SVOC-052	benz(a)anthracene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-053	Benzo(a)pyrene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-054	Total Benzo(b) and Benzo(k) fluoranthrene	< 0.0010	mg/L	Joanna Yang KTP
SVOC-055	Benzo(g,h,i)perylene	<0.001	mg/L	Joanna Yang KTP
SVOC-057	Chrysene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-058	Dibenz(a,h)anthracene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-059	Fluoranthene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-060	Fluorene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-061	Indeno(1,2,3-cd)pyrene	<0.0001	mg/L	Joanna Yang KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-18	Levin C2ds		16/01/2019 00:00	16/01/2019 16:26	0

Notes: 99474-0 Levin Landfill Sample

	Test	Result	Units	Signatory
SVOC-062	Naphthalene	<0.0001	mg/L	Joanna Yang KTP
SVOC-063	Phenanthrene	<0.0001	mg/L	Joanna Yang KTP
SVOC-064	Pyrene	<0.0001	mg/L	Joanna Yang KTP
SVOC-066	2,2',3,4,4',5'-Hexachlorobiphenyl	<0.001	mg/L	Joanna Yang KTP
SVOC-067	2,2',4,5,5'-Pentachlorobiphenyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-068	2,4,4'-Trichlorobiphenyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-069	2,4-Dichlorobiphenyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-070	2,2',3,4,4',5',6-Heptachlorobiphenyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-072	Bis(2-ethylhexyl)adipate	<0.0001	mg/L	Joanna Yang KTP
VOC-001	1,2,4-Trimethylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-002	1,3,5-Trimethylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-003	Benzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-005	Isopropylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-007	Naphthalene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-008	n-Butylbenezene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-009	n-Propylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-010	o-Xylene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-011	p-Isopropyltoluene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-013	sec-Butylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-014	Styrene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-015	tert-Butylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-016	Toluene	0.0016	mg/L	Ganesh Ilancko KTP
VOC-017	Total p,m Xylene, Ethylbenzene	<0.0015	mg/L	Ganesh Ilancko KTP
VOC-018	1,1,1,2-Tetrachloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-019	1,1,1-Trichloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-020	1,1,2,2-Tetrachloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-021	1,1,2-Trichloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-022	1,1-Dichloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-023	1,1-Dichloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-024	1,1-Dichloropropene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-025	1,2,3-Trichloropropane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-026	1,2-Dibromo-3-chloropropane	<0.001	mg/L	Ganesh Ilancko KTP
VOC-027	1,2-Dibromoethane	<0.0002	mg/L	Ganesh Ilancko KTP
VOC-028	1,2-Dichloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-029	1,2-Dichloropropane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-030	1,3-Dichloropropane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-031	2,2-Dichloropropane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-032	Allyl chloride	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-033	Bromochloromethane	<0.0012	mg/L	Ganesh Ilancko KTP
VOC-034	Bromomethane	<0.001	mg/L	Ganesh Ilancko KTP
VOC-035	Carbon tetrachloride	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-036	Chloroethane	<0.001	mg/L	Ganesh Ilancko KTP
VOC-037	Chloromethane	<0.006	mg/L	Ganesh Ilancko KTP
VOC-038	cis-1,2-Dichloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-039	cis-1,3-Dichloropropene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-040	Dibromomethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-041	Dichlorodifluoromethane	<0.001	mg/L	Ganesh Ilancko KTP
VOC-043	Hexachlorobutadiene	<0.0002	mg/L	Ganesh Ilancko KTP
VOC-044	Tetrachloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-045	trans-1,2-Dichloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-046	trans-1,3-Dichloropropene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-047	Trichloroethene	<0.0005	mg/L	Ganesh Ilancko KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-18	Levin C2ds		16/01/2019 00:00	16/01/2019 16:26	0

Notes: 99474-0 Levin Landfill Sample

	Test	Result	Units	Signatory
VOC-048	Trichlorofluoromethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-049	Vinyl Chloride	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-050	1,2,3-Trichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-051	1,2,4-Trichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-052	1,2-Dichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-053	1,3-Dichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-054	1,4-Dichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-055	2-Chlorotoluene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-056	4-Chlorotoluene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-057	Bromobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-058	Chlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-059	1,3,5-Trichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-060	4-Methyl-2-Pentanone	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-061	Carbon disulphide	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-062	Bromodichloromethane	< 0.0005	mg/L	Ganesh Ilancko KTP
VOC-063	Bromoform	< 0.0005	mg/L	Ganesh Ilancko KTP
VOC-064	Chloroform	< 0.0005	mg/L	Ganesh Ilancko KTP
VOC-065	Dibromochloromethane	< 0.0005	mg/L	Ganesh Ilancko KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-19	Levin C2dd		14/01/2019 00:00	15/01/2019 10:47	0

Notes: 99456-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0001	pH	7.4		Gordon McArthur KTP
0002	Suspended Solids - Total	< 6	g/m³	Marylou Cabral KTP
0040	Total (NP) Organic Carbon	4.0	g/m³	Tracy Morrison KTP
0052	Alkalinity - Total	192	g CaCO3/m³	Gordon McArthur KTP
0055	Conductivity at 25°C	51.0	mS/m	Gordon McArthur KTP
0081	Chemical Oxygen Demand	< 15	g/m³	Gordon McArthur KTP
0085	BOD5 - Total	< 1	g/m³	Gordon McArthur KTP
0602	Chloride	37.7	g/m³	Shanel Kumar KTP
0605	Nitrate - Nitrogen	< 0.01	g/m³	Shanel Kumar KTP
0607	Sulphate	0.02	g/m³	Shanel Kumar KTP
0760	Ammonia Nitrogen	0.32	g/m³	Divina Lagazon KTP
1642	Total Hardness	163	g CaCO3/m³	Richard Zhao KTP
1810	Calcium - Dissolved	42.4	g/m³	Richard Zhao KTP
1819	Iron - Dissolved	0.017	g/m³	Richard Zhao KTP
1822	Magnesium - Dissolved	13.7	g/m³	Richard Zhao KTP
1834	Sodium - Dissolved	40.8	g/m³	Richard Zhao KTP
2088	Dissolved Reactive Phosphorus	0.671	g/m³	Divina Lagazon KTP
6701	Aluminium - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
6703	Arsenic - Dissolved	0.003	g/m³	Shanel Kumar KTP
6707	Boron - Dissolved	0.06	g/m³	Shanel Kumar KTP
6708	Cadmium - Dissolved	< 0.0002	g/m³	Shanel Kumar KTP
6711	Chromium - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6713	Copper - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6718	Lead - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	0.555	g/m³	Shanel Kumar KTP
6724	Nickel - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6726	Potassium - Dissolved	6.33	g/m³	Shanel Kumar KTP
6738	Zinc - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
M0102	Faecal Coliforms	< 4	cfu/100ml	Juana Tamayo KTP
MO-5001	Volatile Fatty Acids	< 5 *	g/m³	Chen Lin (Transcription)

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-19	Levin C2dd		14/01/2019 00:00	15/01/2019 10:47	0

Notes: 99456-0 Levin Landfill Sample

	Test	Result	Units	Signatory
MO-5002	Total Halogenated Phenolics	< 0.05	g/m³	Prashilla Singh (Transcribed)

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-20	Levin C2		16/01/2019 00:00	16/01/2019 16:26	0

Notes: 99473-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0001	pH	7.0		Jennifer Mont KTP
0002	Suspended Solids - Total	14	g/m³	Gordon McArthur KTP
0040	Total (NP) Organic Carbon	48.3	g/m³	Sharon van Soest KTP
0052	Alkalinity - Total	939	g CaCO3/m³	Jennifer Mont KTP
0055	Conductivity at 25°C	320	mS/m	Jennifer Mont KTP
0081	Chemical Oxygen Demand	244	g/m³	Gordon McArthur KTP
0085	BOD5 - Total	< 6	g/m³	Gordon McArthur KTP
0602	Chloride	377	g/m³	Shanel Kumar KTP
0605	Nitrate - Nitrogen	< 0.01	g/m³	Shanel Kumar KTP
0607	Sulphate	25.5	g/m³	Shanel Kumar KTP
0760	Ammonia Nitrogen	157	g/m³	Divina Lagazon KTP
1642	Total Hardness	293	g CaCO3/m³	Shanel Kumar KTP
1810	Calcium - Dissolved	61.4	g/m³	Shanel Kumar KTP
1819	Iron - Dissolved	1.48	g/m³	Shanel Kumar KTP
1822	Magnesium - Dissolved	32.4	g/m³	Shanel Kumar KTP
1834	Sodium - Dissolved	295	g/m³	Shanel Kumar KTP
2088	Dissolved Reactive Phosphorus	0.021	g/m³	Divina Lagazon KTP
6701	Aluminium - Dissolved	0.011	g/m³	Shanel Kumar KTP
6703	Arsenic - Dissolved	0.001	g/m³	Shanel Kumar KTP
6707	Boron - Dissolved	2.06	g/m³	Shanel Kumar KTP
6708	Cadmium - Dissolved	< 0.0002	g/m³	Shanel Kumar KTP
6711	Chromium - Dissolved	0.002	g/m³	Shanel Kumar KTP
6713	Copper - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6718	Lead - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	0.0778	g/m³	Shanel Kumar KTP
6724	Nickel - Dissolved	0.0060	g/m³	Shanel Kumar KTP
6726	Potassium - Dissolved	85.3	g/m³	Shanel Kumar KTP
6738	Zinc - Dissolved	0.003	g/m³	Shanel Kumar KTP
M0102	Faecal Coliforms	< 4	cfu/100ml	Maria Norris KTP
MO-5001	Volatile Fatty Acids	< 5 *	g/m³	Lizzie Addis (Transcription)
MO-5002	Total Halogenated Phenolics	< 0.05	g/m³	Prashilla Singh (Transcribed)
SVOC-001	2,3-Diuron	<0.001	mg/L	Joanna Yang KTP
SVOC-002	a-BHC	<0.0001	mg/L	Joanna Yang KTP
SVOC-003	a-chlordane	<0.0001	mg/L	Joanna Yang KTP
SVOC-004	Aldrin	<0.001	mg/L	Joanna Yang KTP
SVOC-005	b-BHC	<0.0001	mg/L	Joanna Yang KTP
SVOC-006	cis-Permethrin	<0.0001	mg/L	Joanna Yang KTP
SVOC-007	Dieldrin	<0.0001	mg/L	Joanna Yang KTP
SVOC-008	Endosulfan II	<0.005	mg/L	Joanna Yang KTP
SVOC-009	Endosulfan Sulfate	<0.0001	mg/L	Joanna Yang KTP
SVOC-010	Endrin	<0.0001	mg/L	Joanna Yang KTP
SVOC-011	Endrin Aldehyde	<0.001	mg/L	Joanna Yang KTP
SVOC-013	Gamma-Chlordane	<0.001	mg/L	Joanna Yang KTP
SVOC-015	Heptachlor Epoxide	<0.0001	mg/L	Joanna Yang KTP
SVOC-016	Hexachlorobenzene	<0.0001	mg/L	Joanna Yang KTP
SVOC-017	Lindane (g-BHC)	<0.0001	mg/L	Joanna Yang KTP
SVOC-019	p,p'-DDD	<0.0001	mg/L	Joanna Yang KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-20	Levin C2		16/01/2019 00:00	16/01/2019 16:26	0

Notes: 99473-0 Levin Landfill Sample

	Test	Result	Units	Signatory
SVOC-020	p,p'DDE	<0.0001	mg/L	Joanna Yang KTP
SVOC-021	p,p'-DDT	< 0.001	mg/L	Joanna Yang KTP
SVOC-022	Procymidone	<0.0001	mg/L	Joanna Yang KTP
SVOC-023	Propanil	<0.001	mg/L	Joanna Yang KTP
SVOC-024	Endosulfan I	<0.001	mg/L	Joanna Yang KTP
SVOC-025	Alachlor	<0.0001	mg/L	Joanna Yang KTP
SVOC-026	Aldicarb	<0.1	mg/L	Joanna Yang KTP
SVOC-027	Atrazine	<0.0001	mg/L	Joanna Yang KTP
SVOC-028	Bromacil	<0.005	mg/L	Joanna Yang KTP
SVOC-030	Cyanazine	<0.005	mg/L	Joanna Yang KTP
SVOC-031	d-BHC	<0.0001	mg/L	Joanna Yang KTP
SVOC-032	Metalaxyl-M	<0.001	mg/L	Joanna Yang KTP
SVOC-033	Metolachlor	<0.0001	mg/L	Joanna Yang KTP
SVOC-034	Metribuzin	<0.0001	mg/L	Joanna Yang KTP
SVOC-035	Molinate	<0.0001	mg/L	Joanna Yang KTP
SVOC-037	Oxadiazon	<0.0001	mg/L	Joanna Yang KTP
SVOC-038	Pendimethalin	<0.002	mg/L	Joanna Yang KTP
SVOC-039	Propazine	<0.0001	mg/L	Joanna Yang KTP
SVOC-040	Pyriproxyfen	<0.0001	mg/L	Joanna Yang KTP
SVOC-041	Simazine	<0.0001	mg/L	Joanna Yang KTP
SVOC-042	Terbuthylazine	<0.0001	mg/L	Joanna Yang KTP
SVOC-043	Trifluralin	<0.0001	mg/L	Joanna Yang KTP
SVOC-045	Chlorpyrifos	<0.0001	mg/L	Joanna Yang KTP
SVOC-046	Diazinon	<0.0001	mg/L	Joanna Yang KTP
SVOC-047	Dimethoate	<0.001	mg/L	Joanna Yang KTP
SVOC-048	Pirimiphos methyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-049	Acenapthene	<0.0001	mg/L	Joanna Yang KTP
SVOC-050	Acenaphthylene	< 0.0010	mg/L	Joanna Yang KTP
SVOC-051	Anthracene	< 0.0010	mg/L	Joanna Yang KTP
SVOC-052	benz(a)anthracene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-053	Benzo(a)pyrene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-054	Total Benzo(b) and Benzo(k) fluoranthrene	< 0.0010	mg/L	Joanna Yang KTP
SVOC-055	Benzo(g,h,i)perylene	<0.001	mg/L	Joanna Yang KTP
SVOC-057	Chrysene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-058	Dibenz(a,h)anthracene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-059	Fluoranthene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-060	Fluorene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-061	Indeno(1,2,3-cd)pyrene	<0.0001	mg/L	Joanna Yang KTP
SVOC-062	Naphthalene	<0.0001	mg/L	Joanna Yang KTP
SVOC-063	Phenanthrene	<0.0001	mg/L	Joanna Yang KTP
SVOC-064	Pyrene	<0.0001	mg/L	Joanna Yang KTP
SVOC-066	2,2',3,4,4',5'-Hexachlorobiphenyl	<0.001	mg/L	Joanna Yang KTP
SVOC-067	2,2',4,5,5'-Pentachlorobiphenyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-068	2,4,4'-Trichlorobiphenyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-069	2,4-Dichlorobiphenyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-070	2,2',3,4,4',5',6-Heptachlorobiphenyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-072	Bis(2-ethylhexyl)adipate	<0.0001	mg/L	Joanna Yang KTP
VOC-001	1,2,4-Trimethylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-002	1,3,5-Trimethylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-003	Benzene	0.0011	mg/L	Ganesh Ilancko KTP
VOC-005	Isopropylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-20	Levin C2		16/01/2019 00:00	16/01/2019 16:26	0

Notes: 99473-0 Levin Landfill Sample

	Test	Result	Units	Signatory
VOC-007	Naphthalene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-008	n-Butylbenezene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-009	n-Propylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-010	o-Xylene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-011	p-Isopropyltoluene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-013	sec-Butylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-014	Styrene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-015	tert-Butylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-016	Toluene	0.0016	mg/L	Ganesh Ilancko KTP
VOC-017	Total p,m Xylene, Ethylbenzene	<0.0015	mg/L	Ganesh Ilancko KTP
VOC-018	1,1,1,2-Tetrachloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-019	1,1,1-Trichloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-020	1,1,2,2-Tetrachloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-021	1,1,2-Trichloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-022	1,1-Dichloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-023	1,1-Dichloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-024	1,1-Dichloropropene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-025	1,2,3-Trichloropropane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-026	1,2-Dibromo-3-chloropropane	<0.001	mg/L	Ganesh Ilancko KTP
VOC-027	1,2-Dibromoethane	<0.0002	mg/L	Ganesh Ilancko KTP
VOC-028	1,2-Dichloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-029	1,2-Dichloropropane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-030	1,3-Dichloropropane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-031	2,2-Dichloropropane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-032	Allyl chloride	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-033	Bromochloromethane	<0.0012	mg/L	Ganesh Ilancko KTP
VOC-034	Bromomethane	<0.001	mg/L	Ganesh Ilancko KTP
VOC-035	Carbon tetrachloride	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-036	Chloroethane	<0.001	mg/L	Ganesh Ilancko KTP
VOC-037	Chloromethane	<0.006	mg/L	Ganesh Ilancko KTP
VOC-038	cis-1,2-Dichloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-039	cis-1,3-Dichloropropene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-040	Dibromomethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-041	Dichlorodifluoromethane	<0.001	mg/L	Ganesh Ilancko KTP
VOC-043	Hexachlorobutadiene	<0.0002	mg/L	Ganesh Ilancko KTP
VOC-044	Tetrachloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-045	trans-1,2-Dichloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-046	trans-1,3-Dichloropropene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-047	Trichloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-048	Trichlorofluoromethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-049	Vinyl Chloride	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-050	1,2,3-Trichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-051	1,2,4-Trichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-052	1,2-Dichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-053	1,3-Dichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-054	1,4-Dichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-055	2-Chlorotoluene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-056	4-Chlorotoluene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-057	Bromobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-058	Chlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-059	1,3,5-Trichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-060	4-Methyl-2-Pentanone	<0.0005	mg/L	Ganesh Ilancko KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-20	Levin C2		16/01/2019 00:00	16/01/2019 16:26	0

Notes: 99473-0 Levin Landfill Sample

	Test	Result	Units	Signatory
VOC-061	Carbon disulphide	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-062	Bromodichloromethane	< 0.0005	mg/L	Ganesh Ilancko KTP
VOC-063	Bromoform	< 0.0005	mg/L	Ganesh Ilancko KTP
VOC-064	Chloroform	< 0.0005	mg/L	Ganesh Ilancko KTP
VOC-065	Dibromochloromethane	< 0.0005	mg/L	Ganesh Ilancko KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-21	Levin C1		15/01/2019 00:00	16/01/2019 09:39	0

Notes: 99455-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0001	pH	6.9		Jennifer Mont KTP
0002	Suspended Solids - Total	62	g/m³	Marylou Cabral KTP
0040	Total (NP) Organic Carbon	14.6	g/m³	Tracy Morrison KTP
0052	Alkalinity - Total	222	g CaCO3/m³	Jennifer Mont KTP
0055	Conductivity at 25°C	98.5	mS/m	Jennifer Mont KTP
0081	Chemical Oxygen Demand	36	g/m³	Gordon McArthur KTP
0085	BOD5 - Total	< 6	g/m³	Gordon McArthur KTP
0602	Chloride	156	g/m³	Shanel Kumar KTP
0605	Nitrate - Nitrogen	< 0.01	g/m³	Shanel Kumar KTP
0607	Sulphate	19.4	g/m³	Shanel Kumar KTP
0760	Ammonia Nitrogen	1.10	g/m³	Divina Lagazon KTP
1642	Total Hardness	196	g CaCO3/m³	Richard Zhao KTP
1810	Calcium - Dissolved	36.4	g/m³	Richard Zhao KTP
1819	Iron - Dissolved	2.14	g/m³	Richard Zhao KTP
1822	Magnesium - Dissolved	25.5	g/m³	Richard Zhao KTP
1834	Sodium - Dissolved	116	g/m³	Richard Zhao KTP
2088	Dissolved Reactive Phosphorus	0.020	g/m³	Divina Lagazon KTP
6701	Aluminium - Dissolved	0.014	g/m³	Shanel Kumar KTP
6703	Arsenic - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6707	Boron - Dissolved	0.57	g/m³	Shanel Kumar KTP
6708	Cadmium - Dissolved	< 0.0002	g/m³	Shanel Kumar KTP
6711	Chromium - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6713	Copper - Dissolved	0.0005	g/m³	Shanel Kumar KTP
6718	Lead - Dissolved	0.0007	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	0.241	g/m³	Shanel Kumar KTP
6724	Nickel - Dissolved	0.0007	g/m³	Shanel Kumar KTP
6726	Potassium - Dissolved	11.4	g/m³	Shanel Kumar KTP
6738	Zinc - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
M0102	Faecal Coliforms	16	cfu/100ml	Maria Norris KTP
MO-5001	Volatile Fatty Acids	< 5 *	g/m³	Lizzie Addis (Transcription)
MO-5002	Total Halogenated Phenolics	< 0.05	g/m³	Prashilla Singh (Transcribed)

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-22	Levin B3s		16/01/2019 00:00	16/01/2019 16:26	0

Notes: 99472-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0001	pH	6.9		Jennifer Mont KTP
0002	Suspended Solids - Total	84	g/m³	Gordon McArthur KTP
0040	Total (NP) Organic Carbon	67.4	g/m³	Sharon van Soest KTP
0052	Alkalinity - Total	1,280	g CaCO3/m³	Gordon McArthur KTP
0055	Conductivity at 25°C	318	mS/m	Jennifer Mont KTP
0081	Chemical Oxygen Demand	199	g/m³	Gordon McArthur KTP
0085	BOD5 - Total	< 6	g/m³	Gordon McArthur KTP
0602	Chloride	219	g/m³	Shanel Kumar KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-22	Levin B3s		16/01/2019 00:00	16/01/2019 16:26	0

Notes: 99472-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0605	Nitrate - Nitrogen	< 0.01	g/m³	Shanel Kumar KTP
0607	Sulphate	0.33	g/m³	Shanel Kumar KTP
0760	Ammonia Nitrogen	179	g/m³	Divina Lagazon KTP
1642	Total Hardness	475	g CaCO3/m³	Shanel Kumar KTP
1810	Calcium - Dissolved	98.6	g/m³	Shanel Kumar KTP
1819	Iron - Dissolved	0.857	g/m³	Shanel Kumar KTP
1822	Magnesium - Dissolved	55.2	g/m³	Shanel Kumar KTP
1834	Sodium - Dissolved	155	g/m³	Shanel Kumar KTP
2088	Dissolved Reactive Phosphorus	0.044	g/m³	Divina Lagazon KTP
6701	Aluminium - Dissolved	0.004	g/m³	Shanel Kumar KTP
6703	Arsenic - Dissolved	0.026	g/m³	Shanel Kumar KTP
6707	Boron - Dissolved	1.31	g/m³	Shanel Kumar KTP
6708	Cadmium - Dissolved	< 0.0002	g/m³	Shanel Kumar KTP
6711	Chromium - Dissolved	0.005	g/m³	Shanel Kumar KTP
6713	Copper - Dissolved	0.0017	g/m³	Shanel Kumar KTP
6718	Lead - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	3.32	g/m³	Shanel Kumar KTP
6724	Nickel - Dissolved	0.0126	g/m³	Shanel Kumar KTP
6726	Potassium - Dissolved	104	g/m³	Sharon van Soest KTP
6738	Zinc - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
M0102	Faecal Coliforms	< 4	cfu/100ml	Maria Norris KTP
MO-5001	Volatile Fatty Acids	< 5 *	g/m³	Lizzie Addis (Transcription)
MO-5002	Total Halogenated Phenolics	< 0.05	g/m³	Prashilla Singh (Transcribed)
SVOC-001	2,3-Diuron	<0.001	mg/L	Joanna Yang KTP
SVOC-002	a-BHC	<0.0001	mg/L	Joanna Yang KTP
SVOC-003	a-chlordane	<0.0001	mg/L	Joanna Yang KTP
SVOC-004	Aldrin	<0.001	mg/L	Joanna Yang KTP
SVOC-005	b-BHC	<0.0001	mg/L	Joanna Yang KTP
SVOC-006	cis-Permethrin	<0.0001	mg/L	Joanna Yang KTP
SVOC-007	Dieldrin	<0.0001	mg/L	Joanna Yang KTP
SVOC-008	Endosulfan II	<0.005	mg/L	Joanna Yang KTP
SVOC-009	Endosulfan Sulfate	<0.0001	mg/L	Joanna Yang KTP
SVOC-010	Endrin	<0.0001	mg/L	Joanna Yang KTP
SVOC-011	Endrin Aldehyde	<0.001	mg/L	Joanna Yang KTP
SVOC-013	Gamma-Chlordane	<0.001	mg/L	Joanna Yang KTP
SVOC-015	Heptachlor Epoxide	<0.0001	mg/L	Joanna Yang KTP
SVOC-016	Hexachlorobenzene	<0.0001	mg/L	Joanna Yang KTP
SVOC-017	Lindane (g-BHC)	<0.0001	mg/L	Joanna Yang KTP
SVOC-019	p,p'-DDD	<0.0001	mg/L	Joanna Yang KTP
SVOC-020	p,p'DDE	<0.0001	mg/L	Joanna Yang KTP
SVOC-021	p,p'-DDT	< 0.001	mg/L	Joanna Yang KTP
SVOC-022	Procymidone	<0.0001	mg/L	Joanna Yang KTP
SVOC-023	Propanil	<0.001	mg/L	Joanna Yang KTP
SVOC-024	Endosulfan I	<0.001	mg/L	Joanna Yang KTP
SVOC-025	Alachlor	<0.0001	mg/L	Joanna Yang KTP
SVOC-026	Aldicarb	<0.1	mg/L	Joanna Yang KTP
SVOC-027	Atrazine	<0.0001	mg/L	Joanna Yang KTP
SVOC-028	Bromacil	<0.005	mg/L	Joanna Yang KTP
SVOC-030	Cyanazine	<0.005	mg/L	Joanna Yang KTP
SVOC-031	d-BHC	<0.0001	mg/L	Joanna Yang KTP
SVOC-032	Metalaxyl-M	<0.001	mg/L	Joanna Yang KTP
SVOC-033	Metolachlor	<0.0001	mg/L	Joanna Yang KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-22	Levin B3s		16/01/2019 00:00	16/01/2019 16:26	0

Notes: 99472-0 Levin Landfill Sample

	Test	Result	Units	Signatory
SVOC-034	Metribuzin	<0.0001	mg/L	Joanna Yang KTP
SVOC-035	Molinate	<0.0001	mg/L	Joanna Yang KTP
SVOC-037	Oxadiazon	<0.0001	mg/L	Joanna Yang KTP
SVOC-038	Pendimethalin	<0.002	mg/L	Joanna Yang KTP
SVOC-039	Propazine	<0.0001	mg/L	Joanna Yang KTP
SVOC-040	Pyriproxyfen	<0.0001	mg/L	Joanna Yang KTP
SVOC-041	Simazine	<0.0001	mg/L	Joanna Yang KTP
SVOC-042	Terbuthylazine	<0.0001	mg/L	Joanna Yang KTP
SVOC-043	Trifluralin	<0.0001	mg/L	Joanna Yang KTP
SVOC-045	Chlorpyrifos	<0.0001	mg/L	Joanna Yang KTP
SVOC-046	Diazinon	<0.0001	mg/L	Joanna Yang KTP
SVOC-047	Dimethoate	<0.001	mg/L	Joanna Yang KTP
SVOC-048	Pirimiphos methyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-049	Acenapthene	<0.0001	mg/L	Joanna Yang KTP
SVOC-050	Acenaphthylene	< 0.0010	mg/L	Joanna Yang KTP
SVOC-051	Anthracene	< 0.0010	mg/L	Joanna Yang KTP
SVOC-052	benz(a)anthracene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-053	Benzo(a)pyrene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-054	Total Benzo(b) and Benzo(k) fluoranthrene	< 0.0010	mg/L	Joanna Yang KTP
SVOC-055	Benzo(g,h,i)perylene	<0.001	mg/L	Joanna Yang KTP
SVOC-057	Chrysene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-058	Dibenz(a,h)anthracene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-059	Fluoranthene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-060	Fluorene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-061	Indeno(1,2,3-cd)pyrene	<0.0001	mg/L	Joanna Yang KTP
SVOC-062	Naphthalene	<0.0001	mg/L	Joanna Yang KTP
SVOC-063	Phenanthrene	<0.0001	mg/L	Joanna Yang KTP
SVOC-064	Pyrene	<0.0001	mg/L	Joanna Yang KTP
SVOC-066	2,2',3,4,4',5'-Hexachlorobiphenyl	<0.001	mg/L	Joanna Yang KTP
SVOC-067	2,2',4,5,5'-Pentachlorobiphenyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-068	2,4,4'-Trichlorobiphenyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-069	2,4-Dichlorobiphenyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-070	2,2',3,4,4',5',6-Heptachlorobiphenyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-072	Bis(2-ethylhexyl)adipate	<0.0001	mg/L	Joanna Yang KTP
VOC-001	1,2,4-Trimethylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-002	1,3,5-Trimethylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-003	Benzene	0.0010	mg/L	Ganesh Ilancko KTP
VOC-005	Isopropylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-007	Naphthalene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-008	n-Butylbenezene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-009	n-Propylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-010	o-Xylene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-011	p-Isopropyltoluene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-013	sec-Butylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-014	Styrene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-015	tert-Butylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-016	Toluene	0.0015	mg/L	Ganesh Ilancko KTP
VOC-017	Total p,m Xylene, Ethylbenzene	<0.0015	mg/L	Ganesh Ilancko KTP
VOC-018	1,1,1,2-Tetrachloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-019	1,1,1-Trichloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-020	1,1,2,2-Tetrachloroethane	<0.0005	mg/L	Ganesh Ilancko KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-22	Levin B3s		16/01/2019 00:00	16/01/2019 16:26	0

Notes: 99472-0 Levin Landfill Sample

	Test	Result	Units	Signatory
VOC-021	1,1,2-Trichloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-022	1,1-Dichloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-023	1,1-Dichloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-024	1,1-Dichloropropene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-025	1,2,3-Trichloropropane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-026	1,2-Dibromo-3-chloropropane	<0.001	mg/L	Ganesh Ilancko KTP
VOC-027	1,2-Dibromoethane	<0.0002	mg/L	Ganesh Ilancko KTP
VOC-028	1,2-Dichloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-029	1,2-Dichloropropane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-030	1,3-Dichloropropane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-031	2,2-Dichloropropane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-032	Allyl chloride	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-033	Bromochloromethane	<0.0012	mg/L	Ganesh Ilancko KTP
VOC-034	Bromomethane	<0.001	mg/L	Ganesh Ilancko KTP
VOC-035	Carbon tetrachloride	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-036	Chloroethane	<0.001	mg/L	Ganesh Ilancko KTP
VOC-037	Chloromethane	<0.006	mg/L	Ganesh Ilancko KTP
VOC-038	cis-1,2-Dichloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-039	cis-1,3-Dichloropropene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-040	Dibromomethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-041	Dichlorodifluoromethane	<0.001	mg/L	Ganesh Ilancko KTP
VOC-043	Hexachlorobutadiene	<0.0002	mg/L	Ganesh Ilancko KTP
VOC-044	Tetrachloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-045	trans-1,2-Dichloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-046	trans-1,3-Dichloropropene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-047	Trichloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-048	Trichlorofluoromethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-049	Vinyl Chloride	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-050	1,2,3-Trichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-051	1,2,4-Trichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-052	1,2-Dichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-053	1,3-Dichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-054	1,4-Dichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-055	2-Chlorotoluene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-056	4-Chlorotoluene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-057	Bromobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-058	Chlorobenzene	0.0005	mg/L	Ganesh Ilancko KTP
VOC-059	1,3,5-Trichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-060	4-Methyl-2-Pentanone	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-061	Carbon disulphide	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-062	Bromodichloromethane	< 0.0005	mg/L	Ganesh Ilancko KTP
VOC-063	Bromoform	< 0.0005	mg/L	Ganesh Ilancko KTP
VOC-064	Chloroform	< 0.0005	mg/L	Ganesh Ilancko KTP
VOC-065	Dibromochloromethane	< 0.0005	mg/L	Ganesh Ilancko KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-23	Levin B2		16/01/2019 00:00	16/01/2019 16:26	0

Notes: 99471-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0001	pH	6.9		Jennifer Mont KTP
0002	Suspended Solids - Total	< 6	g/m³	Gordon McArthur KTP
0040	Total (NP) Organic Carbon	26.4	g/m³	Sharon van Soest KTP
0052	Alkalinity - Total	466	g CaCO3/m³	Jennifer Mont KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-23	Levin B2		16/01/2019 00:00	16/01/2019 16:26	0

Notes: 99471-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0055	Conductivity at 25°C	152	mS/m	Jennifer Mont KTP
0081	Chemical Oxygen Demand	36	g/m³	Gordon McArthur KTP
0085	BOD5 - Total	< 3	g/m³	Gordon McArthur KTP
0602	Chloride	101	g/m³	Shanel Kumar KTP
0605	Nitrate - Nitrogen	16.9	g/m³	Shanel Kumar KTP
0607	Sulphate	45.7	g/m³	Shanel Kumar KTP
0760	Ammonia Nitrogen	43.6	g/m³	Divina Lagazon KTP
1642	Total Hardness	235	g CaCO3/m³	Shanel Kumar KTP
1810	Calcium - Dissolved	50.1	g/m³	Shanel Kumar KTP
1819	Iron - Dissolved	1.06	g/m³	Shanel Kumar KTP
1822	Magnesium - Dissolved	25.6	g/m³	Shanel Kumar KTP
1834	Sodium - Dissolved	130	g/m³	Shanel Kumar KTP
2088	Dissolved Reactive Phosphorus	0.035	g/m³	Divina Lagazon KTP
6701	Aluminium - Dissolved	0.014	g/m³	Shanel Kumar KTP
6703	Arsenic - Dissolved	0.003	g/m³	Shanel Kumar KTP
6707	Boron - Dissolved	1.07	g/m³	Shanel Kumar KTP
6708	Cadmium - Dissolved	< 0.0002	g/m³	Shanel Kumar KTP
6711	Chromium - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6713	Copper - Dissolved	0.0026	g/m³	Shanel Kumar KTP
6718	Lead - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	1.93	g/m³	Shanel Kumar KTP
6724	Nickel - Dissolved	0.0018	g/m³	Shanel Kumar KTP
6726	Potassium - Dissolved	47.4	g/m³	Sharon van Soest KTP
6738	Zinc - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
M0102	Faecal Coliforms	< 4	cfu/100ml	Maria Norris KTP
MO-5001	Volatile Fatty Acids	< 5 *	g/m³	Lizzie Addis (Transcription)
MO-5002	Total Halogenated Phenolics	< 0.05	g/m³	Prashilla Singh (Transcribed)
SVOC-001	2,3-Diuron	<0.001	mg/L	Joanna Yang KTP
SVOC-002	a-BHC	<0.0001	mg/L	Joanna Yang KTP
SVOC-003	a-chlordane	<0.0001	mg/L	Joanna Yang KTP
SVOC-004	Aldrin	<0.001	mg/L	Joanna Yang KTP
SVOC-005	b-BHC	<0.0001	mg/L	Joanna Yang KTP
SVOC-006	cis-Permethrin	<0.0001	mg/L	Joanna Yang KTP
SVOC-007	Dieldrin	<0.0001	mg/L	Joanna Yang KTP
SVOC-008	Endosulfan II	<0.005	mg/L	Joanna Yang KTP
SVOC-009	Endosulfan Sulfate	<0.0001	mg/L	Joanna Yang KTP
SVOC-010	Endrin	<0.0001	mg/L	Joanna Yang KTP
SVOC-011	Endrin Aldehyde	<0.001	mg/L	Joanna Yang KTP
SVOC-013	Gamma-Chlordane	<0.001	mg/L	Joanna Yang KTP
SVOC-015	Heptachlor Epoxide	<0.0001	mg/L	Joanna Yang KTP
SVOC-016	Hexachlorobenzene	<0.0001	mg/L	Joanna Yang KTP
SVOC-017	Lindane (g-BHC)	<0.0001	mg/L	Joanna Yang KTP
SVOC-019	p,p'-DDD	<0.0001	mg/L	Joanna Yang KTP
SVOC-020	p,p'DDE	<0.0001	mg/L	Joanna Yang KTP
SVOC-021	p,p'-DDT	< 0.001	mg/L	Joanna Yang KTP
SVOC-022	Procymidone	<0.0001	mg/L	Joanna Yang KTP
SVOC-023	Propanil	<0.001	mg/L	Joanna Yang KTP
SVOC-024	Endosulfan I	<0.001	mg/L	Joanna Yang KTP
SVOC-025	Alachlor	<0.0001	mg/L	Joanna Yang KTP
SVOC-026	Aldicarb	<0.1	mg/L	Joanna Yang KTP
SVOC-027	Atrazine	<0.0001	mg/L	Joanna Yang KTP
SVOC-028	Bromacil	<0.005	mg/L	Joanna Yang KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-23	Levin B2		16/01/2019 00:00	16/01/2019 16:26	0

Notes: 99471-0 Levin Landfill Sample

	Test	Result	Units	Signatory
SVOC-030	Cyanazine	<0.005	mg/L	Joanna Yang KTP
SVOC-031	d-BHC	<0.0001	mg/L	Joanna Yang KTP
SVOC-032	Metalaxyl-M	<0.001	mg/L	Joanna Yang KTP
SVOC-033	Metolachlor	<0.0001	mg/L	Joanna Yang KTP
SVOC-034	Metribuzin	<0.0001	mg/L	Joanna Yang KTP
SVOC-035	Molinate	<0.0001	mg/L	Joanna Yang KTP
SVOC-037	Oxadiazon	<0.0001	mg/L	Joanna Yang KTP
SVOC-038	Pendimethalin	<0.002	mg/L	Joanna Yang KTP
SVOC-039	Propazine	<0.0001	mg/L	Joanna Yang KTP
SVOC-040	Pyriproxyfen	<0.0001	mg/L	Joanna Yang KTP
SVOC-041	Simazine	<0.0001	mg/L	Joanna Yang KTP
SVOC-042	Terbuthylazine	<0.0001	mg/L	Joanna Yang KTP
SVOC-043	Trifluralin	<0.0001	mg/L	Joanna Yang KTP
SVOC-045	Chlorpyrifos	<0.0001	mg/L	Joanna Yang KTP
SVOC-046	Diazinon	<0.0001	mg/L	Joanna Yang KTP
SVOC-047	Dimethoate	<0.001	mg/L	Joanna Yang KTP
SVOC-048	Pirimiphos methyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-049	Acenapthene	<0.0001	mg/L	Joanna Yang KTP
SVOC-050	Acenaphthylene	< 0.0010	mg/L	Joanna Yang KTP
SVOC-051	Anthracene	< 0.0010	mg/L	Joanna Yang KTP
SVOC-052	benz(a)anthracene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-053	Benzo(a)pyrene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-054	Total Benzo(b) and Benzo(k) fluoranthrene	< 0.0010	mg/L	Joanna Yang KTP
SVOC-055	Benzo(g,h,i)perylene	<0.001	mg/L	Joanna Yang KTP
SVOC-057	Chrysene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-058	Dibenz(a,h)anthracene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-059	Fluoranthene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-060	Fluorene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-061	Indeno(1,2,3-cd)pyrene	<0.0001	mg/L	Joanna Yang KTP
SVOC-062	Naphthalene	<0.0001	mg/L	Joanna Yang KTP
SVOC-063	Phenanthrene	<0.0001	mg/L	Joanna Yang KTP
SVOC-064	Pyrene	<0.0001	mg/L	Joanna Yang KTP
SVOC-066	2,2',3,4,4',5'-Hexachlorobiphenyl	<0.001	mg/L	Joanna Yang KTP
SVOC-067	2,2',4,5,5'-Pentachlorobiphenyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-068	2,4,4'-Trichlorobiphenyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-069	2,4-Dichlorobiphenyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-070	2,2',3,4,4',5',6-Heptachlorobiphenyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-072	Bis(2-ethylhexyl)adipate	<0.0001	mg/L	Joanna Yang KTP
VOC-001	1,2,4-Trimethylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-002	1,3,5-Trimethylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-003	Benzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-005	Isopropylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-007	Naphthalene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-008	n-Butylbenezene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-009	n-Propylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-010	o-Xylene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-011	p-Isopropyltoluene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-013	sec-Butylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-014	Styrene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-015	tert-Butylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-016	Toluene	0.0015	mg/L	Ganesh Ilancko KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-23	Levin B2		16/01/2019 00:00	16/01/2019 16:26	0

Notes: 99471-0 Levin Landfill Sample

	Test	Result	Units	Signatory
VOC-017	Total p,m Xylene, Ethylbenzene	<0.0015	mg/L	Ganesh Ilancko KTP
VOC-018	1,1,1,2-Tetrachloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-019	1,1,1-Trichloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-020	1,1,2,2-Tetrachloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-021	1,1,2-Trichloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-022	1,1-Dichloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-023	1,1-Dichloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-024	1,1-Dichloropropene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-025	1,2,3-Trichloropropane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-026	1,2-Dibromo-3-chloropropane	<0.001	mg/L	Ganesh Ilancko KTP
VOC-027	1,2-Dibromoethane	<0.0002	mg/L	Ganesh Ilancko KTP
VOC-028	1,2-Dichloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-029	1,2-Dichloropropane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-030	1,3-Dichloropropane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-031	2,2-Dichloropropane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-032	Allyl chloride	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-033	Bromochloromethane	<0.0012	mg/L	Ganesh Ilancko KTP
VOC-034	Bromomethane	<0.001	mg/L	Ganesh Ilancko KTP
VOC-035	Carbon tetrachloride	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-036	Chloroethane	<0.001	mg/L	Ganesh Ilancko KTP
VOC-037	Chloromethane	<0.006	mg/L	Ganesh Ilancko KTP
VOC-038	cis-1,2-Dichloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-039	cis-1,3-Dichloropropene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-040	Dibromomethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-041	Dichlorodifluoromethane	<0.001	mg/L	Ganesh Ilancko KTP
VOC-043	Hexachlorobutadiene	<0.0002	mg/L	Ganesh Ilancko KTP
VOC-044	Tetrachloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-045	trans-1,2-Dichloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-046	trans-1,3-Dichloropropene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-047	Trichloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-048	Trichlorofluoromethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-049	Vinyl Chloride	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-050	1,2,3-Trichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-051	1,2,4-Trichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-052	1,2-Dichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-053	1,3-Dichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-054	1,4-Dichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-055	2-Chlorotoluene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-056	4-Chlorotoluene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-057	Bromobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-058	Chlorobenzene	0.0037	mg/L	Ganesh Ilancko KTP
VOC-059	1,3,5-Trichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-060	4-Methyl-2-Pentanone	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-061	Carbon disulphide	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-062	Bromodichloromethane	< 0.0005	mg/L	Ganesh Ilancko KTP
VOC-063	Bromoform	< 0.0005	mg/L	Ganesh Ilancko KTP
VOC-064	Chloroform	< 0.0005	mg/L	Ganesh Ilancko KTP
VOC-065	Dibromochloromethane	< 0.0005	mg/L	Ganesh Ilancko KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-24	Levin B1		16/01/2019 00:00	16/01/2019 16:26	0

Notes: 99470-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0001	pH	7.2		Jennifer Mont KTP
0002	Suspended Solids - Total	< 6	g/m³	Gordon McArthur KTP
0040	Total (NP) Organic Carbon	14.7	g/m³	Sharon van Soest KTP
0052	Alkalinity - Total	309	g CaCO3/m³	Jennifer Mont KTP
0055	Conductivity at 25°C	156	mS/m	Jennifer Mont KTP
0081	Chemical Oxygen Demand	92	g/m³	Gordon McArthur KTP
0085	BOD5 - Total	< 3	g/m³	Gordon McArthur KTP
0602	Chloride	269	g/m³	Shanel Kumar KTP
0605	Nitrate - Nitrogen	3.16	g/m³	Shanel Kumar KTP
0607	Sulphate	47.0	g/m³	Shanel Kumar KTP
0760	Ammonia Nitrogen	11.1	g/m³	Divina Lagazon KTP
1642	Total Hardness	379	g CaCO3/m³	Shanel Kumar KTP
1810	Calcium - Dissolved	66.7	g/m³	Shanel Kumar KTP
1819	Iron - Dissolved	0.017	g/m³	Shanel Kumar KTP
1822	Magnesium - Dissolved	50.9	g/m³	Shanel Kumar KTP
1834	Sodium - Dissolved	124	g/m³	Shanel Kumar KTP
2088	Dissolved Reactive Phosphorus	0.099	g/m³	Divina Lagazon KTP
6701	Aluminium - Dissolved	0.002	g/m³	Shanel Kumar KTP
6703	Arsenic - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6707	Boron - Dissolved	0.49	g/m³	Shanel Kumar KTP
6708	Cadmium - Dissolved	0.0004	g/m³	Shanel Kumar KTP
6711	Chromium - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6713	Copper - Dissolved	0.0055	g/m³	Shanel Kumar KTP
6718	Lead - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	8.28	g/m³	Shanel Kumar KTP
6724	Nickel - Dissolved	0.0017	g/m³	Shanel Kumar KTP
6726	Potassium - Dissolved	18.2	g/m³	Sharon van Soest KTP
6738	Zinc - Dissolved	0.003	g/m³	Shanel Kumar KTP
M0102	Faecal Coliforms	< 4	cfu/100ml	Maria Norris KTP
MO-5001	Volatile Fatty Acids	< 5 *	g/m³	Lizzie Addis (Transcription)
MO-5002	Total Halogenated Phenolics	< 0.05	g/m³	Prashilla Singh (Transcribed)
SVOC-001	2,3-Diuron	<0.001	mg/L	Joanna Yang KTP
SVOC-002	a-BHC	<0.0001	mg/L	Joanna Yang KTP
SVOC-003	a-chlordane	<0.0001	mg/L	Joanna Yang KTP
SVOC-004	Aldrin	<0.001	mg/L	Joanna Yang KTP
SVOC-005	b-BHC	<0.0001	mg/L	Joanna Yang KTP
SVOC-006	cis-Permethrin	<0.0001	mg/L	Joanna Yang KTP
SVOC-007	Dieldrin	<0.0001	mg/L	Joanna Yang KTP
SVOC-008	Endosulfan II	<0.005	mg/L	Joanna Yang KTP
SVOC-009	Endosulfan Sulfate	<0.0001	mg/L	Joanna Yang KTP
SVOC-010	Endrin	<0.0001	mg/L	Joanna Yang KTP
SVOC-011	Endrin Aldehyde	<0.001	mg/L	Joanna Yang KTP
SVOC-013	Gamma-Chlordane	<0.001	mg/L	Joanna Yang KTP
SVOC-015	Heptachlor Epoxide	<0.0001	mg/L	Joanna Yang KTP
SVOC-016	Hexachlorobenzene	<0.0001	mg/L	Joanna Yang KTP
SVOC-017	Lindane (g-BHC)	<0.0001	mg/L	Joanna Yang KTP
SVOC-019	p,p'-DDD	<0.0001	mg/L	Joanna Yang KTP
SVOC-020	p,p'DDE	<0.0001	mg/L	Joanna Yang KTP
SVOC-021	p,p'-DDT	< 0.001	mg/L	Joanna Yang KTP
SVOC-022	Procymidone	<0.0001	mg/L	Joanna Yang KTP
SVOC-023	Propanil	<0.001	mg/L	Joanna Yang KTP
SVOC-024	Endosulfan I	<0.001	mg/L	Joanna Yang KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-24	Levin B1		16/01/2019 00:00	16/01/2019 16:26	0

Notes: 99470-0 Levin Landfill Sample

	Test	Result	Units	Signatory
SVOC-025	Alachlor	<0.0001	mg/L	Joanna Yang KTP
SVOC-026	Aldicarb	<0.1	mg/L	Joanna Yang KTP
SVOC-027	Atrazine	<0.0001	mg/L	Joanna Yang KTP
SVOC-028	Bromacil	<0.005	mg/L	Joanna Yang KTP
SVOC-030	Cyanazine	<0.005	mg/L	Joanna Yang KTP
SVOC-031	d-BHC	<0.0001	mg/L	Joanna Yang KTP
SVOC-032	Metalaxyl-M	<0.001	mg/L	Joanna Yang KTP
SVOC-033	Metolachlor	<0.0001	mg/L	Joanna Yang KTP
SVOC-034	Metribuzin	<0.0001	mg/L	Joanna Yang KTP
SVOC-035	Molinate	<0.0001	mg/L	Joanna Yang KTP
SVOC-037	Oxadiazon	<0.0001	mg/L	Joanna Yang KTP
SVOC-038	Pendimethalin	<0.002	mg/L	Joanna Yang KTP
SVOC-039	Propazine	<0.0001	mg/L	Joanna Yang KTP
SVOC-040	Pyriproxyfen	<0.0001	mg/L	Joanna Yang KTP
SVOC-041	Simazine	<0.0001	mg/L	Joanna Yang KTP
SVOC-042	Terbuthylazine	<0.0001	mg/L	Joanna Yang KTP
SVOC-043	Trifluralin	<0.0001	mg/L	Joanna Yang KTP
SVOC-045	Chlorpyrifos	<0.0001	mg/L	Joanna Yang KTP
SVOC-046	Diazinon	<0.0001	mg/L	Joanna Yang KTP
SVOC-047	Dimethoate	<0.001	mg/L	Joanna Yang KTP
SVOC-048	Pirimiphos methyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-049	Acenapthene	<0.0001	mg/L	Joanna Yang KTP
SVOC-050	Acenaphthylene	< 0.0010	mg/L	Joanna Yang KTP
SVOC-051	Anthracene	< 0.0010	mg/L	Joanna Yang KTP
SVOC-052	benz(a)anthracene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-053	Benzo(a)pyrene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-054	Total Benzo(b) and Benzo(k) fluoranthrene	< 0.0010	mg/L	Joanna Yang KTP
SVOC-055	Benzo(g,h,i)perylene	<0.001	mg/L	Joanna Yang KTP
SVOC-057	Chrysene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-058	Dibenz(a,h)anthracene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-059	Fluoranthene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-060	Fluorene	< 0.0001	mg/L	Joanna Yang KTP
SVOC-061	Indeno(1,2,3-cd)pyrene	<0.0001	mg/L	Joanna Yang KTP
SVOC-062	Naphthalene	<0.0001	mg/L	Joanna Yang KTP
SVOC-063	Phenanthrene	<0.0001	mg/L	Joanna Yang KTP
SVOC-064	Pyrene	<0.0001	mg/L	Joanna Yang KTP
SVOC-066	2,2',3,4,4',5'-Hexachlorobiphenyl	<0.001	mg/L	Joanna Yang KTP
SVOC-067	2,2',4,5,5'-Pentachlorobiphenyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-068	2,4,4'-Trichlorobiphenyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-069	2,4-Dichlorobiphenyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-070	2,2',3,4,4',5',6-Heptachlorobiphenyl	<0.0001	mg/L	Joanna Yang KTP
SVOC-072	Bis(2-ethylhexyl)adipate	<0.0001	mg/L	Joanna Yang KTP
VOC-001	1,2,4-Trimethylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-002	1,3,5-Trimethylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-003	Benzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-005	Isopropylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-007	Naphthalene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-008	n-Butylbenezene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-009	n-Propylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-010	o-Xylene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-011	p-Isopropyltoluene	<0.0005	mg/L	Ganesh Ilancko KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-24	Levin B1		16/01/2019 00:00	16/01/2019 16:26	0

Notes: 99470-0 Levin Landfill Sample

	Test	Result	Units	Signatory
VOC-013	sec-Butylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-014	Styrene	0.0012	mg/L	Ganesh Ilancko KTP
VOC-015	tert-Butylbenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-016	Toluene	0.0017	mg/L	Ganesh Ilancko KTP
VOC-017	Total p,m Xylene, Ethylbenzene	<0.0015	mg/L	Ganesh Ilancko KTP
VOC-018	1,1,1,2-Tetrachloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-019	1,1,1-Trichloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-020	1,1,2,2-Tetrachloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-021	1,1,2-Trichloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-022	1,1-Dichloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-023	1,1-Dichloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-024	1,1-Dichloropropene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-025	1,2,3-Trichloropropane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-026	1,2-Dibromo-3-chloropropane	<0.001	mg/L	Ganesh Ilancko KTP
VOC-027	1,2-Dibromoethane	<0.0002	mg/L	Ganesh Ilancko KTP
VOC-028	1,2-Dichloroethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-029	1,2-Dichloropropane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-030	1,3-Dichloropropane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-031	2,2-Dichloropropane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-032	Allyl chloride	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-033	Bromochloromethane	<0.0012	mg/L	Ganesh Ilancko KTP
VOC-034	Bromomethane	<0.001	mg/L	Ganesh Ilancko KTP
VOC-035	Carbon tetrachloride	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-036	Chloroethane	<0.001	mg/L	Ganesh Ilancko KTP
VOC-037	Chloromethane	<0.006	mg/L	Ganesh Ilancko KTP
VOC-038	cis-1,2-Dichloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-039	cis-1,3-Dichloropropene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-040	Dibromomethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-041	Dichlorodifluoromethane	<0.001	mg/L	Ganesh Ilancko KTP
VOC-043	Hexachlorobutadiene	<0.0002	mg/L	Ganesh Ilancko KTP
VOC-044	Tetrachloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-045	trans-1,2-Dichloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-046	trans-1,3-Dichloropropene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-047	Trichloroethene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-048	Trichlorofluoromethane	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-049	Vinyl Chloride	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-050	1,2,3-Trichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-051	1,2,4-Trichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-052	1,2-Dichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-053	1,3-Dichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-054	1,4-Dichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-055	2-Chlorotoluene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-056	4-Chlorotoluene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-057	Bromobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-058	Chlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-059	1,3,5-Trichlorobenzene	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-060	4-Methyl-2-Pentanone	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-061	Carbon disulphide	<0.0005	mg/L	Ganesh Ilancko KTP
VOC-062	Bromodichloromethane	< 0.0005	mg/L	Ganesh Ilancko KTP
VOC-063	Bromoform	< 0.0005	mg/L	Ganesh Ilancko KTP
VOC-064	Chloroform	< 0.0005	mg/L	Ganesh Ilancko KTP
VOC-065	Dibromochloromethane	< 0.0005	mg/L	Ganesh Ilancko KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-25	Levin Landfill quarterly SW5		29/01/2019 00:00	29/01/2019 14:42	0

Notes: 99461-0 Levin Landfill

	Test	Result	Units	Signatory
0001	pH	7.2		Gordon McArthur KTP
0002	Suspended Solids - Total	18	g/m³	Gordon McArthur KTP
0055	Conductivity at 25°C	76.7	mS/m	Gordon McArthur KTP
0081	Chemical Oxygen Demand	67	g/m³	Gordon McArthur KTP
0083	Total Kjeldahl Nitrogen	15.4	g/m³	Gordon McArthur KTP
0085	BOD5 - Total	< 6	g/m³	Gordon McArthur KTP
0602	Chloride	80.6	g/m³	Amit Kumar KTP
0603	Nitrite - Nitrogen	0.09	g/m³	Amit Kumar KTP
0605	Nitrate - Nitrogen	0.08	g/m³	Amit Kumar KTP
0719	Ammonia Nitrogen	9.1	g/m³	Tracy Morrison KTP
2127	Total Nitrogen	10.4	g/m³	Tracy Morrison KTP
6717	Iron - Dissolved	0.23	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	0.237	g/m³	Shanel Kumar KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-26	Levin Landfill quarterly SW4		29/01/2019 00:00	29/01/2019 14:42	0

Notes: 99460-0 Levin Landfill

	Test	Result	Units	Signatory
0001	pH	7.4		Gordon McArthur KTP
0002	Suspended Solids - Total	12	g/m³	Gordon McArthur KTP
0055	Conductivity at 25°C	77.3	mS/m	Gordon McArthur KTP
0081	Chemical Oxygen Demand	64	g/m³	Gordon McArthur KTP
0083	Total Kjeldahl Nitrogen	12.5	g/m³	Gordon McArthur KTP
0085	BOD5 - Total	< 6	g/m³	Gordon McArthur KTP
0602	Chloride	81.7	g/m³	Amit Kumar KTP
0603	Nitrite - Nitrogen	0.09	g/m³	Amit Kumar KTP
0605	Nitrate - Nitrogen	0.16	g/m³	Amit Kumar KTP
0719	Ammonia Nitrogen	9.7	g/m³	Tracy Morrison KTP
2127	Total Nitrogen	10.8	g/m³	Tracy Morrison KTP
6717	Iron - Dissolved	0.29	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	0.225	g/m³	Shanel Kumar KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-27	Levin Landfill quarterly SW3		29/01/2019 00:00	29/01/2019 14:42	0

Notes: 99459-0 Levin Landfill

	Test	Result	Units	Signatory
0001	pH	7.2		Gordon McArthur KTP
0002	Suspended Solids - Total	26	g/m³	Gordon McArthur KTP
0055	Conductivity at 25°C	73.7	mS/m	Gordon McArthur KTP
0081	Chemical Oxygen Demand	43	g/m³	Gordon McArthur KTP
0083	Total Kjeldahl Nitrogen	12.9	g/m³	Gordon McArthur KTP
0085	BOD5 - Total	< 6	g/m³	Gordon McArthur KTP
0602	Chloride	79.3	g/m³	Amit Kumar KTP
0603	Nitrite - Nitrogen	0.11	g/m³	Amit Kumar KTP
0605	Nitrate - Nitrogen	0.65	g/m³	Amit Kumar KTP
0719	Ammonia Nitrogen	10.3	g/m³	Tracy Morrison KTP
2127	Total Nitrogen	11.8	g/m³	Tracy Morrison KTP
6717	Iron - Dissolved	0.50	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	0.104	g/m³	Shanel Kumar KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-28	Levin Landfill quarterly SW2		29/01/2019 00:00	29/01/2019 14:42	0

Notes: 99458-0 Levin Landfill

	Test	Result	Units	Signatory
0001	pH	7.5		Gordon McArthur KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-28	Levin Landfill quarterly SW2		29/01/2019 00:00	29/01/2019 14:42	0

Notes: 99458-0 Levin Landfill

	Test	Result	Units	Signatory
0002	Suspended Solids - Total	11	g/m³	Gordon McArthur KTP
0055	Conductivity at 25°C	178	mS/m	Gordon McArthur KTP
0081	Chemical Oxygen Demand	136	g/m³	Gordon McArthur KTP
0083	Total Kjeldahl Nitrogen	50.8	g/m³	Gordon McArthur KTP
0085	BOD5 - Total	34	g/m³	Gordon McArthur KTP
0602	Chloride	180	g/m³	Amit Kumar KTP
0603	Nitrite - Nitrogen	0.54	g/m³	Amit Kumar KTP
0605	Nitrate - Nitrogen	5.20	g/m³	Amit Kumar KTP
0719	Ammonia Nitrogen	46.8	g/m³	Tracy Morrison KTP
2127	Total Nitrogen	54.2	g/m³	Tracy Morrison KTP
6717	Iron - Dissolved	0.25	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	0.691	g/m³	Shanel Kumar KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-29	Levin Landfill quarterly SW1		29/01/2019 00:00	29/01/2019 14:42	0

Notes: 99457-0 Levin Landfill

	Test	Result	Units	Signatory
0001	pH	6.9		Gordon McArthur KTP
0002	Suspended Solids - Total	353	g/m³	Gordon McArthur KTP
0055	Conductivity at 25°C	271	mS/m	Gordon McArthur KTP
0081	Chemical Oxygen Demand	329	g/m³	Gordon McArthur KTP
0083	Total Kjeldahl Nitrogen	119	g/m³	Gordon McArthur KTP
0085	BOD5 - Total	61	g/m³	Gordon McArthur KTP
0602	Chloride	239	g/m³	Amit Kumar KTP
0603	Nitrite - Nitrogen	0.15	g/m³	Amit Kumar KTP
0605	Nitrate - Nitrogen	1.80	g/m³	Amit Kumar KTP
0719	Ammonia Nitrogen	110	g/m³	Tracy Morrison KTP
2127	Total Nitrogen	119	g/m³	Tracy Morrison KTP
6717	Iron - Dissolved	1.07	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	0.969	g/m³	Shanel Kumar KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-30	Levin HS3		09/01/2019 00:00	09/01/2019 16:19	0

Notes: 99437-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0001	pH	8.8		Jennifer Mont KTP
0002	Suspended Solids - Total	< 6	g/m³	Marylou Cabral KTP
0040	Total (NP) Organic Carbon	7.4	g/m³	Tracy Morrison KTP
0052	Alkalinity - Total	59	g CaCO3/m³	Jennifer Mont KTP
0055	Conductivity at 25°C	24.1	mS/m	Jennifer Mont KTP
0081	Chemical Oxygen Demand	31	g/m³	Marylou Cabral KTP
0085	BOD5 - Total	1	g/m³	Gordon McArthur KTP
0602	Chloride	23.7	g/m³	Shanel Kumar KTP
0605	Nitrate - Nitrogen	0.09	g/m³	Shanel Kumar KTP
0607	Sulphate	17.9	g/m³	Shanel Kumar KTP
0760	Ammonia Nitrogen	0.05	g/m³	Divina Lagazon KTP
1642	Total Hardness	68	g CaCO3/m³	Shanel Kumar KTP
1810	Calcium - Dissolved	14.8	g/m³	Shanel Kumar KTP
1819	Iron - Dissolved	0.101	g/m³	Shanel Kumar KTP
1822	Magnesium - Dissolved	7.59	g/m³	Shanel Kumar KTP
1834	Sodium - Dissolved	21.6	g/m³	Shanel Kumar KTP
2088	Dissolved Reactive Phosphorus	0.176	g/m³	Divina Lagazon KTP
6701	Aluminium - Dissolved	0.007	g/m³	Shanel Kumar KTP
6703	Arsenic - Dissolved	0.002	g/m³	Shanel Kumar KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-30	Levin HS3		09/01/2019 00:00	09/01/2019 16:19	0

Notes: 99437-0 Levin Landfill Sample

	Test	Result	Units	Signatory
6707	Boron - Dissolved	0.05	g/m³	Shanel Kumar KTP
6708	Cadmium - Dissolved	< 0.0002	g/m³	Shanel Kumar KTP
6711	Chromium - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6713	Copper - Dissolved	0.0007	g/m³	Shanel Kumar KTP
6718	Lead - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	0.0125	g/m³	Shanel Kumar KTP
6724	Nickel - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6726	Potassium - Dissolved	1.70	g/m³	Shanel Kumar KTP
6738	Zinc - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
M0102	Faecal Coliforms	140	cfu/100ml	Juana Tamayo KTP
MO-5001	Volatile Fatty Acids	< 5 *	g/m³	Deb Bottrill (Transcribed)
MO-5002	Total Halogenated Phenolics	< 0.01	g/m³	Deb Bottrill (Transcribed)

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-31	Levin HS2		09/01/2019 00:00	09/01/2019 16:19	0

Notes: 99438-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0001	pH	8.9		Jennifer Mont KTP
0002	Suspended Solids - Total	< 6	g/m³	Marylou Cabral KTP
0040	Total (NP) Organic Carbon	7.4	g/m³	Tracy Morrison KTP
0052	Alkalinity - Total	59	g CaCO3/m³	Jennifer Mont KTP
0055	Conductivity at 25°C	23.9	mS/m	Jennifer Mont KTP
0081	Chemical Oxygen Demand	29	g/m³	Marylou Cabral KTP
0085	BOD5 - Total	2	g/m³	Gordon McArthur KTP
0602	Chloride	23.6	g/m³	Shanel Kumar KTP
0605	Nitrate - Nitrogen	0.08	g/m³	Shanel Kumar KTP
0607	Sulphate	17.8	g/m³	Shanel Kumar KTP
0760	Ammonia Nitrogen	0.04	g/m³	Divina Lagazon KTP
1642	Total Hardness	68	g CaCO3/m³	Shanel Kumar KTP
1810	Calcium - Dissolved	14.5	g/m³	Shanel Kumar KTP
1819	Iron - Dissolved	0.093	g/m³	Shanel Kumar KTP
1822	Magnesium - Dissolved	7.57	g/m³	Shanel Kumar KTP
1834	Sodium - Dissolved	21.8	g/m³	Shanel Kumar KTP
2088	Dissolved Reactive Phosphorus	0.171	g/m³	Divina Lagazon KTP
6701	Aluminium - Dissolved	0.008	g/m³	Shanel Kumar KTP
6703	Arsenic - Dissolved	0.002	g/m³	Shanel Kumar KTP
6707	Boron - Dissolved	0.05	g/m³	Shanel Kumar KTP
6708	Cadmium - Dissolved	< 0.0002	g/m³	Shanel Kumar KTP
6711	Chromium - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6713	Copper - Dissolved	0.0007	g/m³	Shanel Kumar KTP
6718	Lead - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	0.0110	g/m³	Shanel Kumar KTP
6724	Nickel - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6726	Potassium - Dissolved	1.65	g/m³	Shanel Kumar KTP
6738	Zinc - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
M0102	Faecal Coliforms	150	cfu/100ml	Juana Tamayo KTP
MO-5001	Volatile Fatty Acids	< 5 *	g/m³	Deb Bottrill (Transcribed)
MO-5002	Total Halogenated Phenolics	< 0.01	g/m³	Deb Bottrill (Transcribed)

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-32	Levin HS1		09/01/2019 00:00	09/01/2019 16:19	0

Notes: 99439-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0001	pH	9.1		Jennifer Mont KTP

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
18/51674-32	Levin HS1		09/01/2019 00:00	09/01/2019 16:19	0

Notes: 99439-0 Levin Landfill Sample

	Test	Result	Units	Signatory
0002	Suspended Solids - Total	< 6	g/m³	Marylou Cabral KTP
0040	Total (NP) Organic Carbon	7.6	g/m³	Tracy Morrison KTP
0052	Alkalinity - Total	57	g CaCO3/m³	Jennifer Mont KTP
0055	Conductivity at 25°C	23.4	mS/m	Jennifer Mont KTP
0081	Chemical Oxygen Demand	33	g/m³	Marylou Cabral KTP
0085	BOD5 - Total	2	g/m³	Gordon McArthur KTP
0602	Chloride	22.8	g/m³	Shanel Kumar KTP
0605	Nitrate - Nitrogen	0.05	g/m³	Shanel Kumar KTP
0607	Sulphate	17.7	g/m³	Shanel Kumar KTP
0760	Ammonia Nitrogen	0.03	g/m³	Divina Lagazon KTP
1642	Total Hardness	63	g CaCO3/m³	Shanel Kumar KTP
1810	Calcium - Dissolved	13.4	g/m³	Shanel Kumar KTP
1819	Iron - Dissolved	0.076	g/m³	Shanel Kumar KTP
1822	Magnesium - Dissolved	7.22	g/m³	Shanel Kumar KTP
1834	Sodium - Dissolved	21.2	g/m³	Shanel Kumar KTP
2088	Dissolved Reactive Phosphorus	0.163	g/m³	Divina Lagazon KTP
6701	Aluminium - Dissolved	0.008	g/m³	Shanel Kumar KTP
6703	Arsenic - Dissolved	0.002	g/m³	Shanel Kumar KTP
6707	Boron - Dissolved	0.05	g/m³	Shanel Kumar KTP
6708	Cadmium - Dissolved	< 0.0002	g/m³	Shanel Kumar KTP
6711	Chromium - Dissolved	< 0.001	g/m³	Shanel Kumar KTP
6713	Copper - Dissolved	0.0007	g/m³	Shanel Kumar KTP
6718	Lead - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6721	Manganese - Dissolved	0.0094	g/m³	Shanel Kumar KTP
6724	Nickel - Dissolved	< 0.0005	g/m³	Shanel Kumar KTP
6726	Potassium - Dissolved	1.59	g/m³	Shanel Kumar KTP
6738	Zinc - Dissolved	< 0.002	g/m³	Shanel Kumar KTP
M0102	Faecal Coliforms	56	cfu/100ml	Juana Tamayo KTP
MO-5001	Volatile Fatty Acids	< 5 *	g/m³	Deb Bottrill (Transcribed)
MO-5002	Total Halogenated Phenolics	< 0.01	g/m³	Deb Bottrill (Transcribed)

Comments:

* Not an accredited test.

Sampled by customer using ELS approved containers.

Test Methodology:

Test	Methodology	Detection Limit
pH	Dedicated pH meter following APHA Online Edition Method 4500 H.	0.1
Suspended Solids - Total	APHA Online Edition Method 2540 D	3 g/m³
Total (NP) Organic Carbon	Total Non-Purgeable Organic Carbon using TOC analyser. APHA Online Edition 5310B,C, ASTM D2579, D4839.	0.1 g/m³
Alkalinity - Total	APHA Online Edition Method 2320 B	1 g CaCO3/m³
Conductivity at 25°C	APHA Online Edition Method 2510 B.	0.1 mS/m
Chemical Oxygen Demand	APHA Online Edition Method 5220 D.	15 g/m³
Total Kjeldahl Nitrogen	APHA Online Edition 4500-N(org) B	0.8 g/m³
BOD5 - Total	APHA Online Edition Method 5210 B.	1 g/m³
Chloride	Ion Chromatography following USEPA 300.0 (modified).	0.02 g/m³
Nitrite - Nitrogen	Ion Chromatography following USEPA 300.0 (modified)	0.01 g/m³
Nitrate - Nitrogen	Ion Chromatography following USEPA 300.0 (modified).	0.01 g/m³
Sulphate	Ion Chromatography following USEPA 300.0 (modified).	0.02 g/m³
Ammonia Nitrogen	Discrete Analyser. In House method based on ISBN 0117516139.	0.01 g/m³

Test	Methodology	Detection Limit
Ammonia Nitrogen	Flow Injection Autoanalyser following APHA Online Edition Method 4500 NH3-H.	0.01 g/m³
Total Hardness	ICP-OES following APHA Online Edition Method 3120 B (modified).	1 g CaCO3/m³
Calcium - Total	ICP-OES following APHA Online Edition Method 3120 B (modified)	0.025 g/m³
Iron - Total	ICP-OES following APHA Online Edition Method 3120 B (modified)	0.013 g/m³
Magnesium - Total	ICP-OES following APHA Online Edition Method 3120 B (modified)	0.025 g/m³
Sodium - Total	ICP-OES following APHA Online Edition Method 3120 B (modified)	0.03 g/m³
Calcium - Dissolved	ICP-OES following APHA Online Edition Method 3120 B (modified).	0.01 g/m³
Iron - Dissolved	ICP-OES following APHA Online Edition Method 3120 B (modified).	0.005 g/m³
Magnesium - Dissolved	ICP-OES following APHA Online Edition Method 3120 B (modified).	0.01 g/m³
Sodium - Dissolved	ICP-OES following APHA Online Edition Method 3120 B (modified).	0.02 g/m³
Dissolved Reactive Phosphorus	Flow Injection Autoanalyser following APHA Online Edition Method 4500-P G.	0.005 g/m³
Total Nitrogen	Flow Injection Autoanalyser following APHA Online Edition Method 4500-NO3 I. Persulphate digestion follows APHA Online Edition 4500-N C.	0.05 g/m³
Aluminium - Total	ICP-MS following APHA Online Edition method 3125 (modified)	0.005 g/m³
Arsenic - Total	ICP-MS following APHA Online Edition method 3125 (modified)	0.002 g/m³
Boron - Total	ICP-MS following APHA Online Edition method 3125 (modified)	0.05 g/m³
Cadmium - Total	ICP-MS following APHA Online Edition method 3125 (modified)	0.001 g/m³
Chromium - Total	ICP-MS following APHA Online Edition method 3125 (modified)	0.001 g/m³
Copper - Total	ICP-MS following APHA Online Edition method 3125 (modified)	0.002 g/m³
Lead - Total	ICP-MS following APHA Online Edition method 3125 (modified)	0.001 g/m³
Manganese - Total	ICP-MS following APHA Online Edition method 3125 (modified)	0.001 g/m³
Nickel - Total	ICP-MS following APHA Online Edition method 3125 (modified)	0.001 g/m³
Potassium - Total	ICP-MS following APHA Online Edition method 3125 (modified)	0.1 g/m³
Zinc - Total	ICP-MS following APHA Online Edition method 3125 (modified)	0.005 g/m³
Aluminium - Dissolved	ICP-MS following APHA Online Edition method 3125 (modified).	0.002 g/m³
Arsenic - Dissolved	ICP-MS following APHA Online Edition method 3125 (modified).	0.001 g/m³
Boron - Dissolved	ICP-MS following APHA Online Edition method 3125 (modified).	0.03 g/m³
Cadmium - Dissolved	ICP-MS following APHA Online Edition method 3125 (modified).	0.0002 g/m³
Chromium - Dissolved	ICP-MS following APHA Online Edition method 3125 (modified).	0.001 g/m³
Copper - Dissolved	ICP-MS following APHA Online Edition method 3125 (modified).	0.0005 g/m³
Iron - Dissolved	ICP-MS following APHA Online Edition method 3125 (modified).	0.01 g/m³
Lead - Dissolved	ICP-MS following APHA Online Edition method 3125 (modified).	0.0005 g/m³
Manganese - Dissolved	ICP-MS following APHA Online Edition method 3125 (modified).	0.0005 g/m³
Nickel - Dissolved	ICP-MS following APHA Online Edition method 3125 (modified).	0.0005 g/m³
Potassium - Dissolved	ICP-MS following APHA Online Edition method 3125 (modified)	0.01 g/m³
Zinc - Dissolved	ICP-MS following APHA Online Edition method 3125 (modified).	0.002 g/m³
Faecal Coliforms	APHA 9222D:Online Edition	1 cfu/100ml
Volatile Fatty Acids	Performed by Eurofins Melbourne following APHA 22nd Edition Method 5560C. Results are reported as acetic acid equivalent.	5 g/m³
Total Halogenated Phenolics	Analyses at Eurofins Melbourne following Method USEPA 8270 Phenols.	0.01 g/m³
Aqueous Total Metal Digestion	Follows APHA Online Edition Method 3030E (modified) using nitric acid.	n/a
2,3-Diuron	Organochlorine Pesticide compound analysed by in-house method using GC-MS	0.001 mg/L
a-BHC	Organochlorine Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
a-chlordane	Organochlorine Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
Aldrin	Organochlorine Pesticide compound analysed by in-house method using GC-MS	0.001 mg/L
b-BHC	Organochlorine Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
cis-Permethrin	Organochlorine Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
Dieldrin	Organochlorine Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
Endosulfan II	Organochlorine Pesticide compound analysed by in-house method using GC-MS	0.005 mg/L
Endosulfan Sulfate	Organochlorine Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
Endrin	Organochlorine Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L

Test	Methodology	Detection Limit
Endrin Aldehyde	Organochlorine Pesticide compound analysed by in-house method using GC-MS	0.001 mg/L
Endrin Ketone	Organochlorine Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
Gamma-Chlordane	Organochlorine Pesticide compound analysed by in-house method using GC-MS	0.001 mg/L
Heptachlor	Organochlorine Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
Heptachlor Epoxide	Organochlorine Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
Hexachlorobenzene	Organochlorine Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
Lindane (g-BHC)	Organochlorine Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
Methoxychlor	Organochlorine Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
p,p'-DDD	Organochlorine Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
p,p'DDE	Organochlorine Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
p,p'-DDT	Organochlorine Pesticide compound analysed by in-house method using GC-MS	0.001 mg/L
Procymidone	Organochlorine Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
Propanil	Organochlorine Pesticide compound analysed by in-house method using GC-MS	0.001 mg/L
Endosulfan I	Organochlorine Pesticide compound analysed by in-house method using GC-MS	0.001 mg/L
Alachlor	Organonitrogen Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
Aldicarb	Organonitrogen Pesticide compound analysed by in-house method using GC-MS	0.1 mg/L
Atrazine	Organonitrogen Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
Bromacil	Organonitrogen Pesticide compound analysed by in-house method using GC-MS	0.005 mg/L
Carbofuran	Organonitrogen Pesticide compound analysed by in-house method using GC-MS	0.001 mg/L
Cyanazine	Organonitrogen Pesticide compound analysed by in-house method using GC-MS	0.005 mg/L
d-BHC	Organonitrogen Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
Metalaxyl-M	Organonitrogen Pesticide compound analysed by in-house method using GC-MS	0.001 mg/L
Metolachlor	Organonitrogen Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
Metribuzin	Organonitrogen Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
Molinate	Organonitrogen Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
Oxadiazon	Organonitrogen Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
Pendimethalin	Organonitrogen Pesticide compound analysed by in-house method using GC-MS	0.002 mg/L
Propazine	Organonitrogen Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
Pyriproxyfen	Organonitrogen Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
Simazine	Organonitrogen Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
Terbuthylazine	Organonitrogen Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
Trifluralin	Organonitrogen Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
Hexazinone	Organonitrogen Pesticide compound analysed by in-house method using GC-MS	0.001 mg/L
Chlorpyrifos	Organophosphorous Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
Diazinon	Organophosphorous Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
Dimethoate	Organophosphorous Pesticide compound analysed by in-house method using GC-MS	0.001 mg/L
Pirimiphos methyl	Organophosphorous Pesticide compound analysed by in-house method using GC-MS	0.0001 mg/L
Acenapthene	Polyaromatic Hydrocarbon compound analysed by in-house method using GC-MS	0.0001 mg/L
Acenaphthylene	Polyaromatic Hydrocarbon compound analysed by in-house method using GC-MS	0.001 mg/L
Anthracene	Polyaromatic Hydrocarbon compound analysed by in-house method using GC-MS	0.001 mg/L
benz(a)anthracene	Polyaromatic Hydrocarbon compound analysed by in-house method using GC-MS	0.0001 mg/L
Benzo(a)pyrene	Polyaromatic Hydrocarbon compound analysed by in-house method using GC-MS	0.0001 mg/L
Total Benzo(b) and Benzo(k) fluoranthrene	Polyaromatic Hydrocarbon compound analysed by in-house method using GC-MS	0.001 mg/L
Benzo(g,h,i)perylene	Polyaromatic Hydrocarbon compound analysed by in-house method using GC-MS	0.001 mg/L
Chrysene	Polyaromatic Hydrocarbon compound analysed by in-house method using GC-MS	0.0001 mg/L
Dibenz(a,h)anthracene	Polyaromatic Hydrocarbon compound analysed by in-house method using GC-MS	0.0001 mg/L
Fluoranthene	Polyaromatic Hydrocarbon compound analysed by in-house method using GC-MS	0.0001 mg/L
Fluorene	Polyaromatic Hydrocarbon compound analysed by in-house method using GC-MS	0.0001 mg/L
Indeno(1,2,3-cd)pyrene	Polyaromatic Hydrocarbon compound analysed by in-house method using GC-MS	0.0001 mg/L
Naphthalene	Polyaromatic Hydrocarbon compound analysed by in-house method using GC-MS	0.0001 mg/L
Phenanthrene	Polyaromatic Hydrocarbon compound analysed by in-house method using GC-MS	0.0001 mg/L

Test	Methodology	Detection Limit
Pyrene	Polyaromatic Hydrocarbon compound analysed by in-house method using GC-MS	0.0001 mg/L
2,2',3,4,4',5'-Hexachlorobiphenyl	Polychlorinated biphenyl compound analysed by in-house method using GC-MS. Also known as PCB 138.	0.001 mg/L
2,2',4,5,5'-Pentachlorobiphenyl	Polychlorinated biphenyl compound analysed by in-house method using GC-MS. Also known as PCB 101.	0.0001 mg/L
2,4,4'-Trichlorobiphenyl	Polychlorinated biphenyl compound analysed by in-house method using GC-MS. Also known as PCB 28.	0.0001 mg/L
2,4-Dichlorobiphenyl	Polychlorinated biphenyl compound analysed by in-house method using GC-MS. Also known as PCB 7.	0.0001 mg/L
2,2',3,4,4',5',6-Heptachlorobiphenyl	Polychlorinated biphenyl compound analysed by in-house method using GC-MS. Also known as PCB 183.	0.0001 mg/L
Bis(2-ethylhexyl)adipate	Phthalate Plasticiser compound analysed by in-house method using GC-MS	0.0001 mg/L
1,2,4-Trimethylbenzene	VOC Aromatic Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
1,3,5-Trimethylbenzene	VOC Aromatic Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
Benzene	VOC Aromatic Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
Isopropylbenzene	VOC Aromatic Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
Naphthalene	VOC Aromatic Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
n-Butylbenezene	VOC Aromatic Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
n-Propylbenzene	VOC Aromatic Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
o-Xylene	VOC Aromatic Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
p-Isopropyltoluene	VOC Aromatic Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
sec-Butylbenzene	VOC Aromatic Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
Styrene	VOC Aromatic Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
tert-Butylbenzene	VOC Aromatic Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
Toluene	VOC Aromatic Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
Total p,m Xylene, Ethylbenzene	VOC Aromatic Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0015 mg/L
1,1,1,2-Tetrachloroethane	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
1,1,1-Trichloroethane	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
1,1,2,2-Tetrachloroethane	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
1,1,2-Trichloroethane	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
1,1-Dichloroethane	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
1,1-Dichloroethene	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
1,1-Dichloropropene	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
1,2,3-Trichloropropane	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
1,2-Dibromo-3-chloropropane	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.001 mg/L
1,2-Dibromoethane	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0002 mg/L
1,2-Dichloroethane	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
1,2-Dichloropropane	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
1,3-Dichloropropane	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
2,2-Dichloropropane	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
Allyl chloride	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
Bromochloromethane	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0012 mg/L

Test	Methodology	Detection Limit
Bromomethane	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.001 mg/L
Carbon tetrachloride	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260. Also known as Tetrachloromethane.	0.0005 mg/L
Chloroethane	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.001 mg/L
Chloromethane	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.006 mg/L
cis-1,2-Dichloroethene	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
cis-1,3-Dichloropropene	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
Dibromomethane	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
Dichlorodifluoromethane	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.001 mg/L
Dichloromethane	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.005 mg/L
Hexachlorobutadiene	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0002 mg/L
Tetrachloroethene	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
trans-1,2-Dichloroethene	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
trans-1,3-Dichloropropene	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
Trichloroethene	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
Trichlorofluoromethane	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
Vinyl Chloride	VOC Halogenated Alkanes and Alkenes Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
1,2,3-Trichlorobenzene	VOC Halogenated Aromatic Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
1,2,4-Trichlorobenzene	VOC Halogenated Aromatic Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
1,2-Dichlorobenzene	VOC Halogenated Aromatic Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
1,3-Dichlorobenzene	VOC Halogenated Aromatic Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
1,4-Dichlorobenzene	VOC Halogenated Aromatic Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
2-Chlorotoluene	VOC Halogenated Aromatic Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
4-Chlorotoluene	VOC Halogenated Aromatic Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
Bromobenzene	VOC Halogenated Aromatic Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
Chlorobenzene	VOC Halogenated Aromatic Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
1,3,5-Trichlorobenzene	VOC Halogenated Aromatic Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
4-Methyl-2-Pentanone	VOC Other Volatile Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L

Test	Methodology	Detection Limit
Carbon disulphide	VOC Other Volatile Compound analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
Bromodichloromethane	VOC Trihalomethane analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
Bromoform	VOC Trihalomethane analysed by GCMS following an in house method based on USEPA Method 8260. Also known as Tribromomethane.	0.0005 mg/L
Chloroform	VOC Trihalomethane analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L
Dibromochloromethane	VOC Trihalomethane analysed by GCMS following an in house method based on USEPA Method 8260.	0.0005 mg/L

Unless otherwise stated, all tests are performed in Wellington.

"<" means that no analyte was found in the sample at the level of detection shown. Detection limits are based on a clean matrix and may vary according to individual sample.

g/m3 is the equivalent to mg/L and ppm.

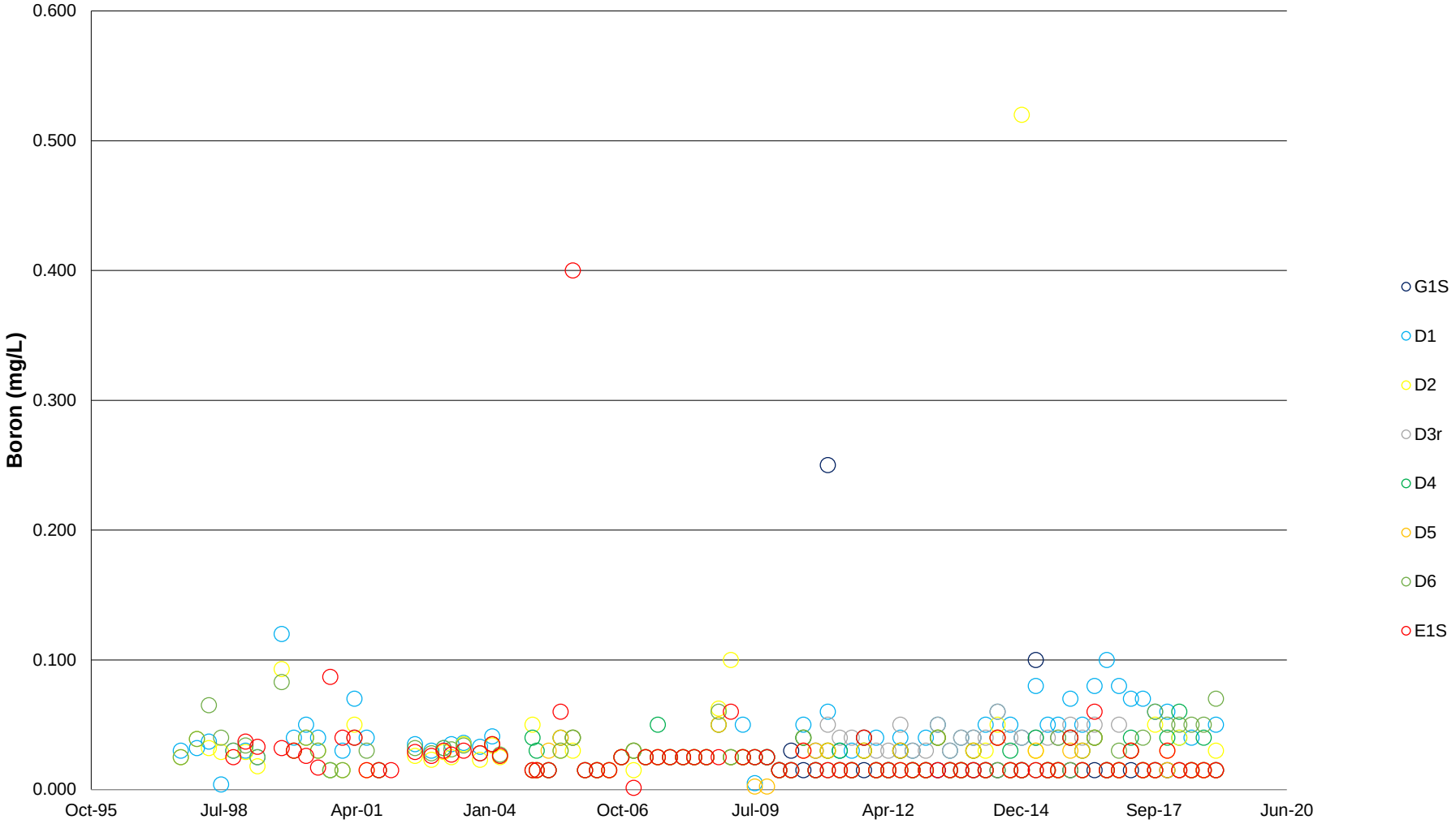
Samples will be retained for a period of time, in suitable conditions appropriate to the analyses requested.

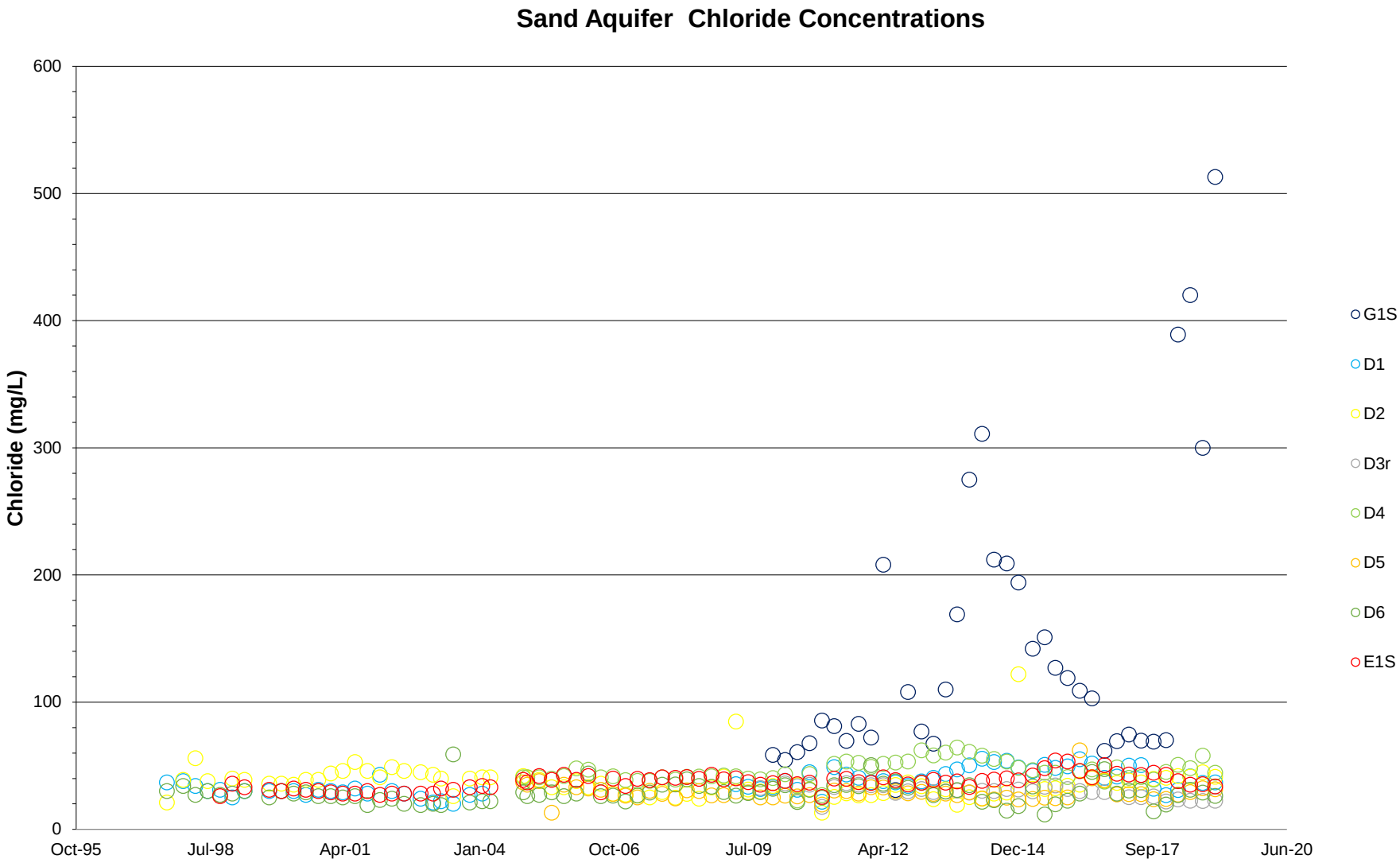
Report Released By
Rob Deacon

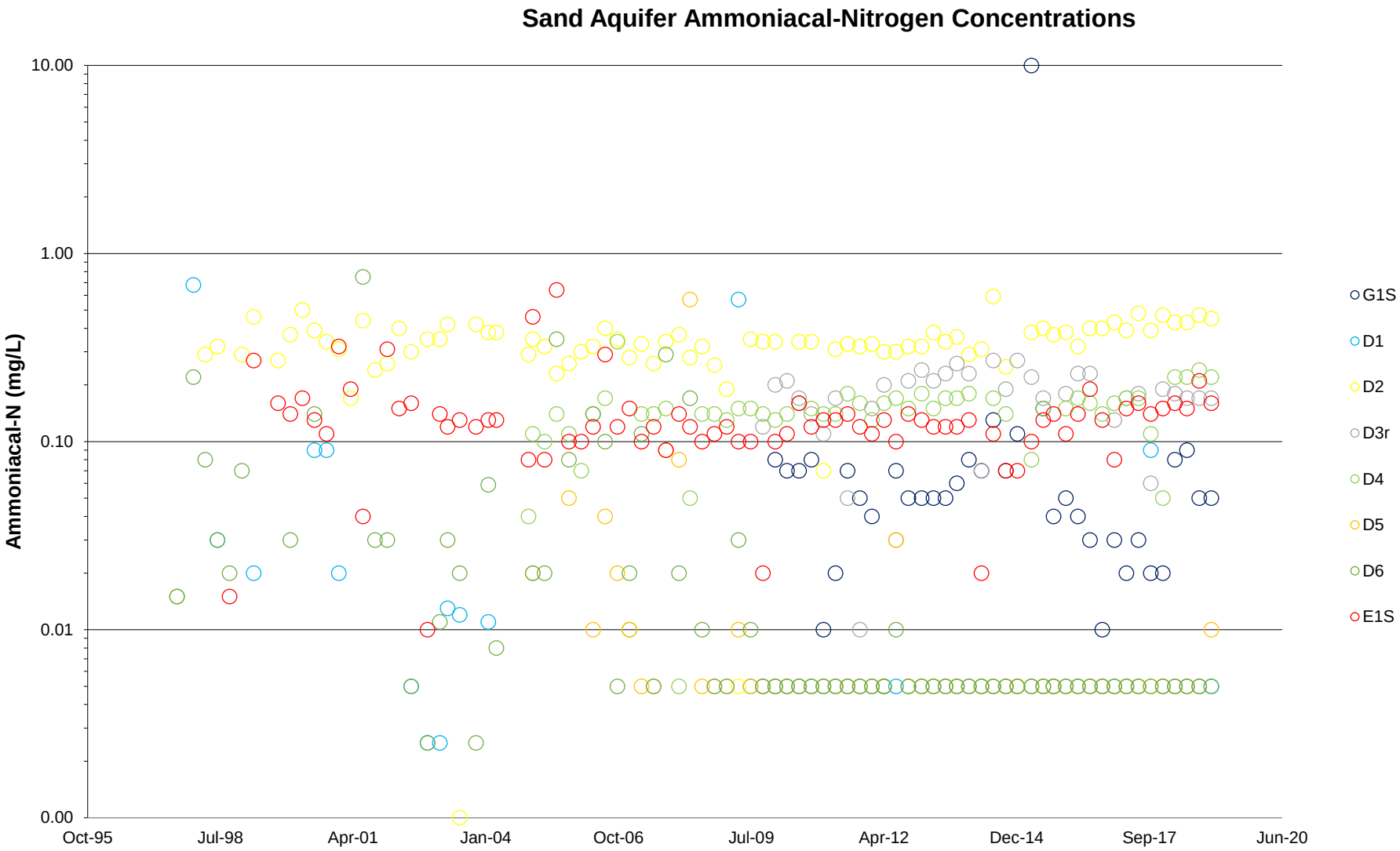
This laboratory is accredited by International Accreditation New Zealand and its reports are recognised in all countries affiliated to the International Laboratory Accreditation Co-operation Mutual Recognition Arrangement (ILAC-MRA). The tests reported have been performed in accordance with our terms of accreditation, with the exception of tests marked "not IANZ", which are outside the scope of this laboratory's accreditation.

Appendix D Historical Result Graphs

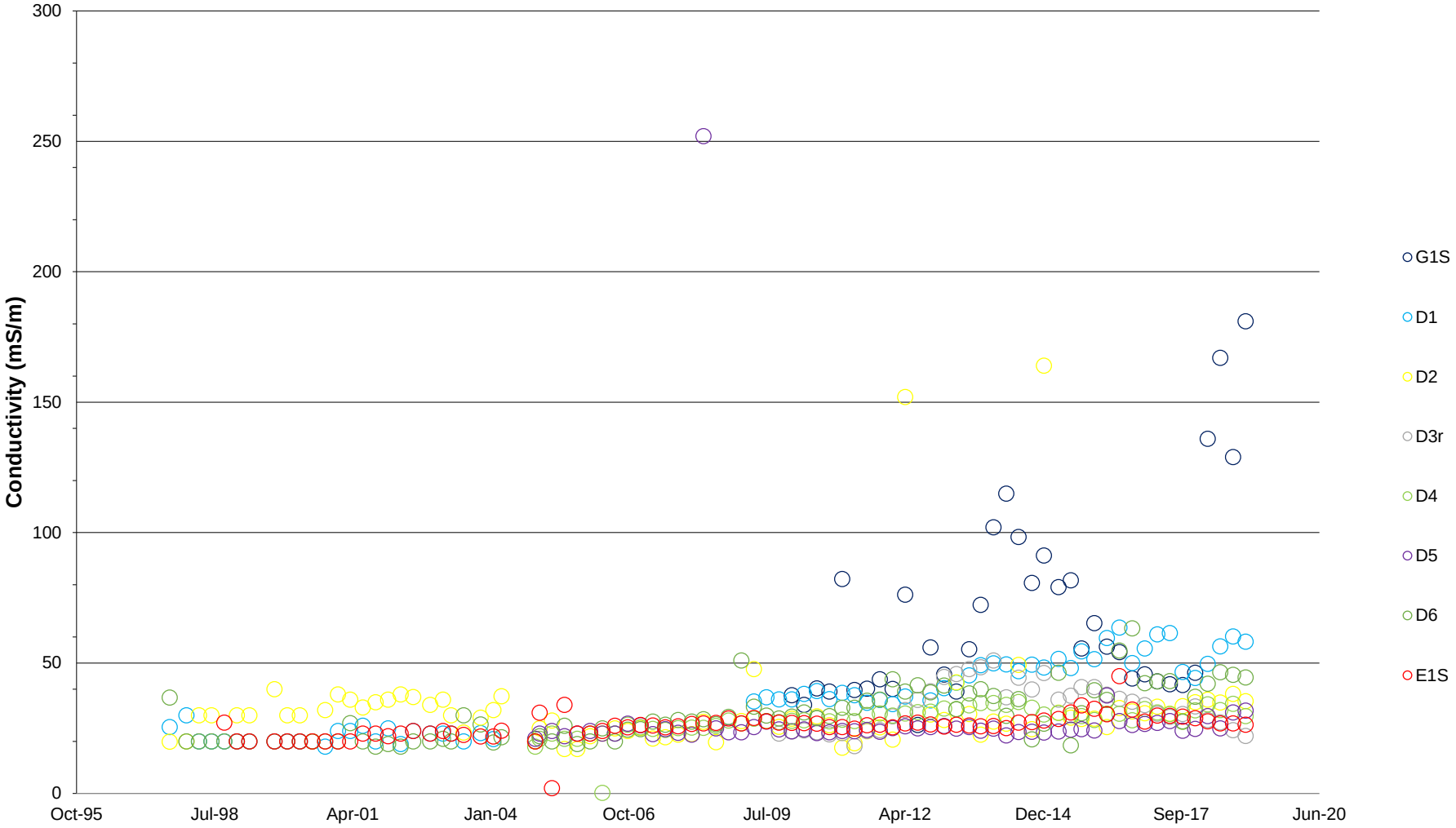
Sand Aquifer Boron Concentrations

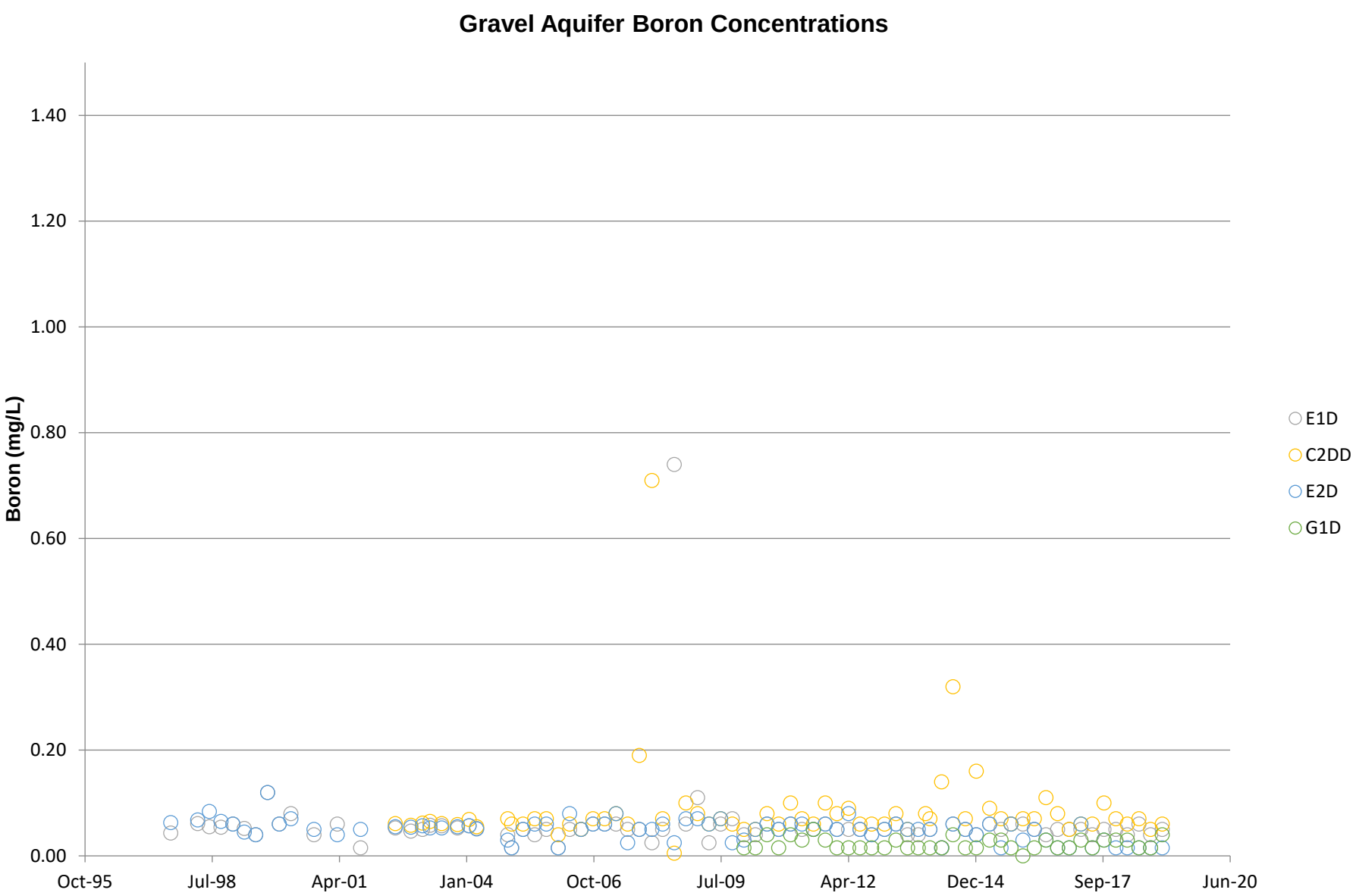


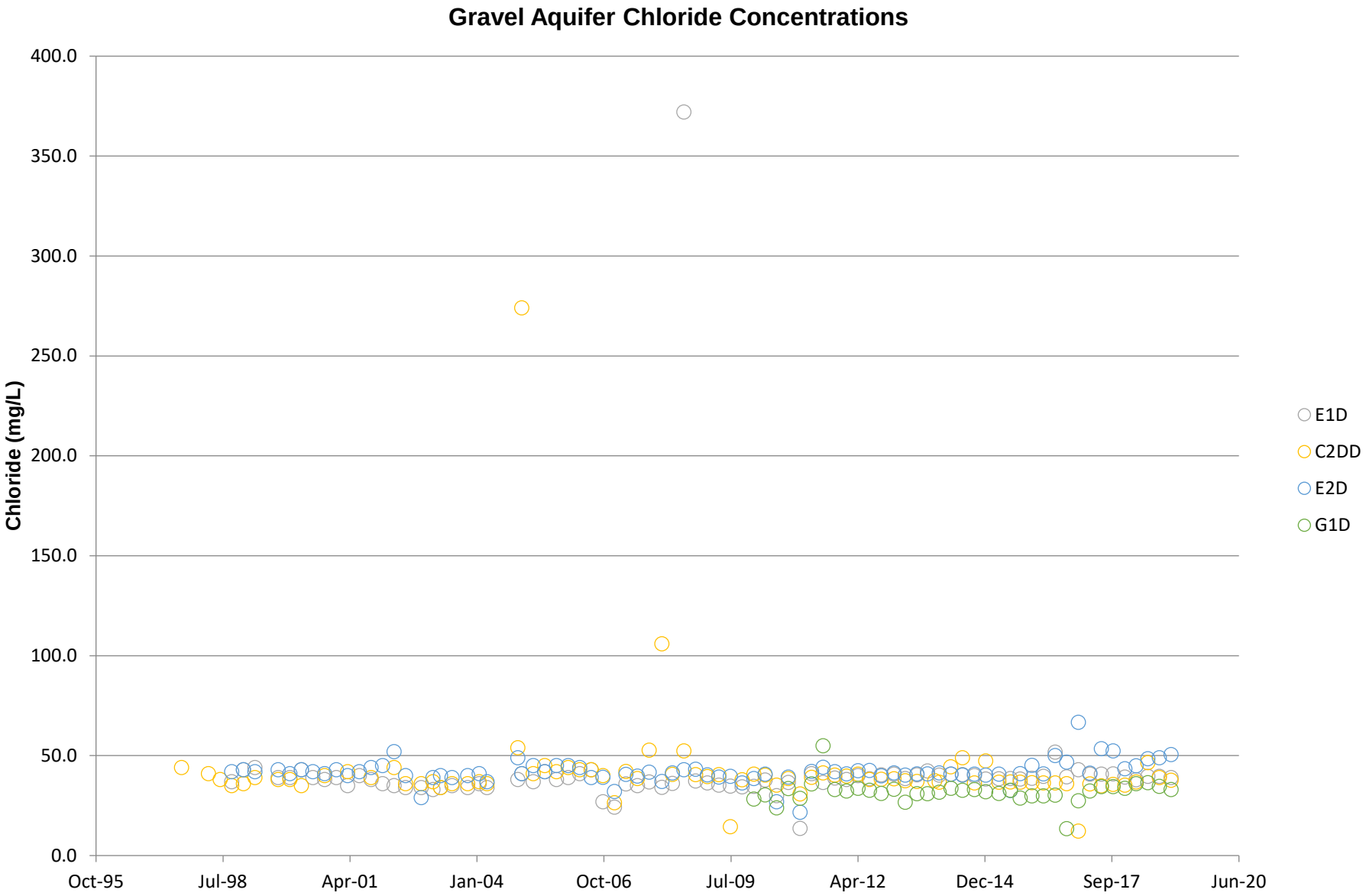

Sand Aquifer Chloride Concentrations
Chloride (mg/L)
600
500
400
300
200
100
0
Oct-95
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
G1S
D1
D2
D3r
D4
D5
D6
E1S

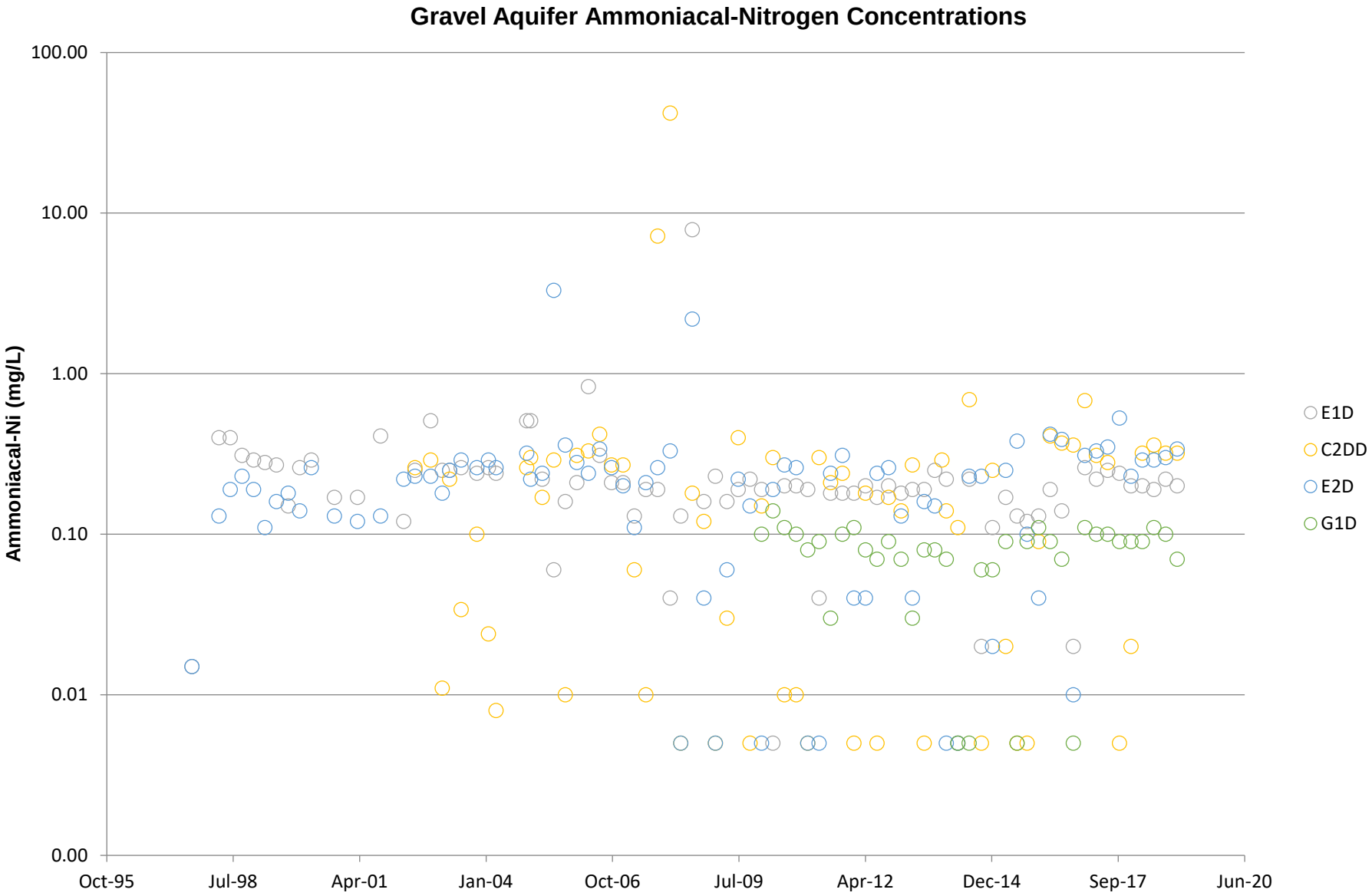

Sand Aquifer Ammoniacal-Nitrogen Concentrations
Ammoniacal-N (mg/L)
10.00
1.00
0.10
0.01
0.00
Oct-95
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
G1S
D1
D2
D3r
D4
D5
D6
E1S

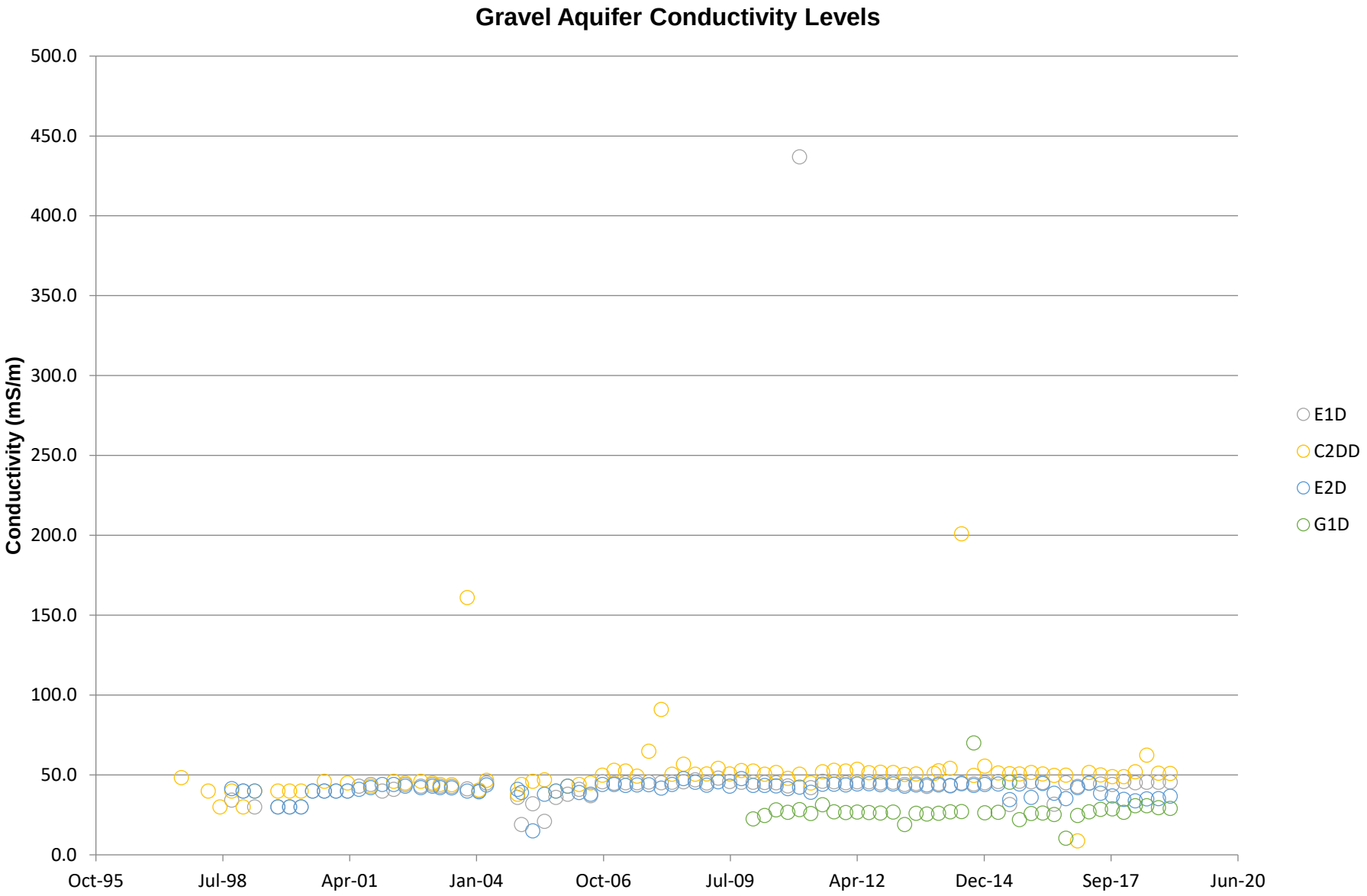
Sand Aquifer Conductivity Levels

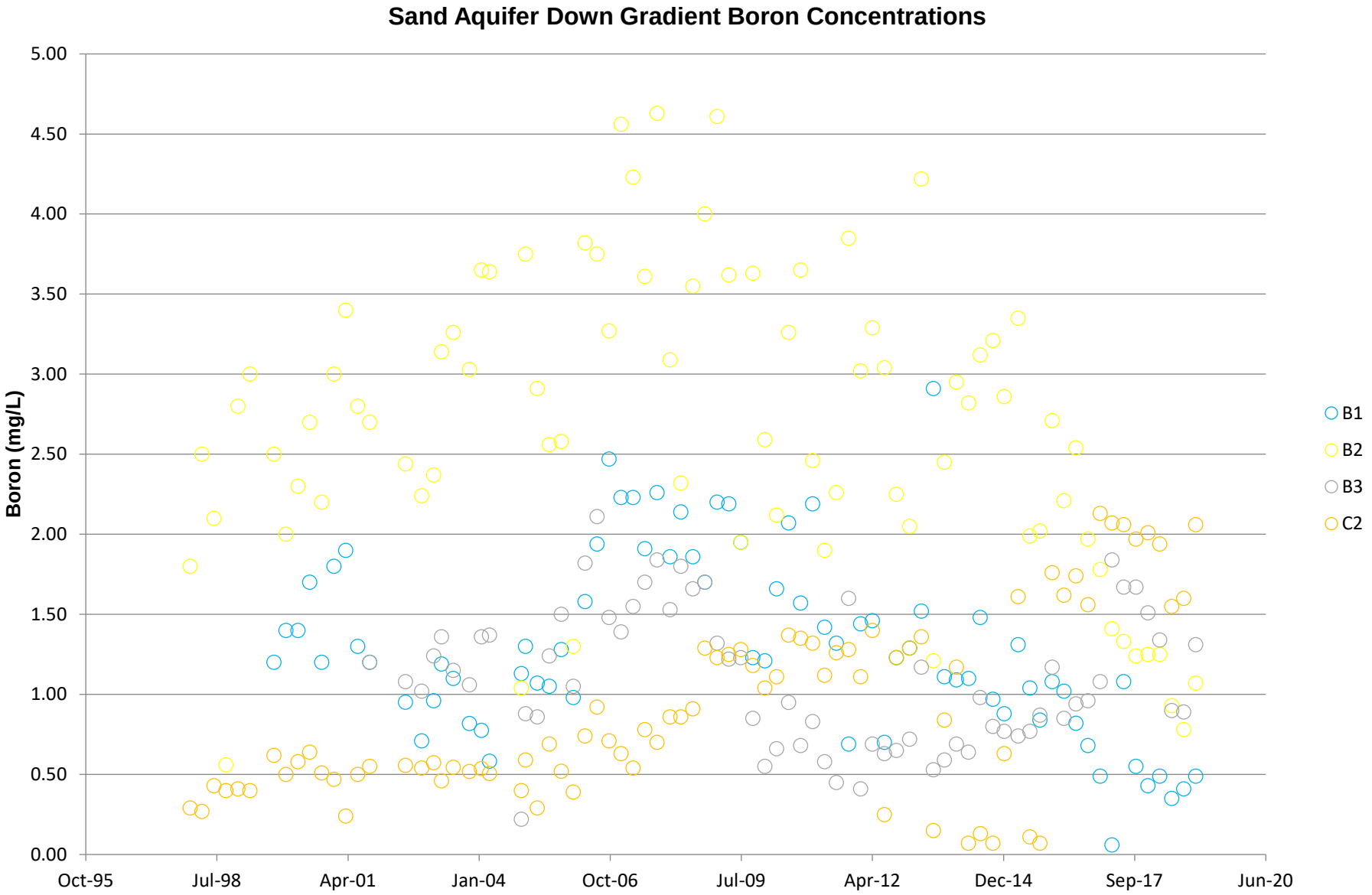


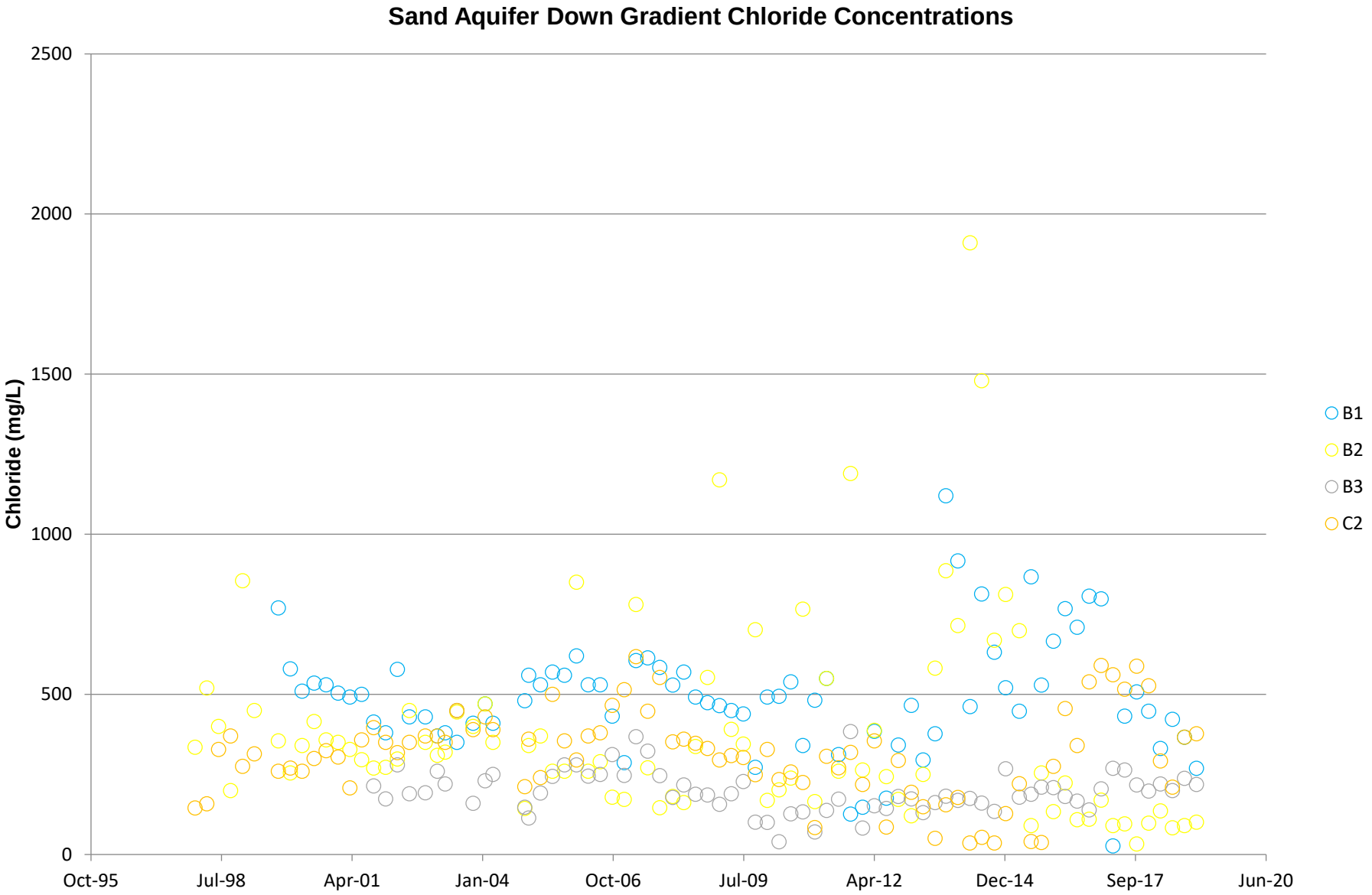

Gravel Aquifer Boron Concentrations
Boron (mg/L)
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
Oct-95
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
E1D
C2DD
E2D
G1D

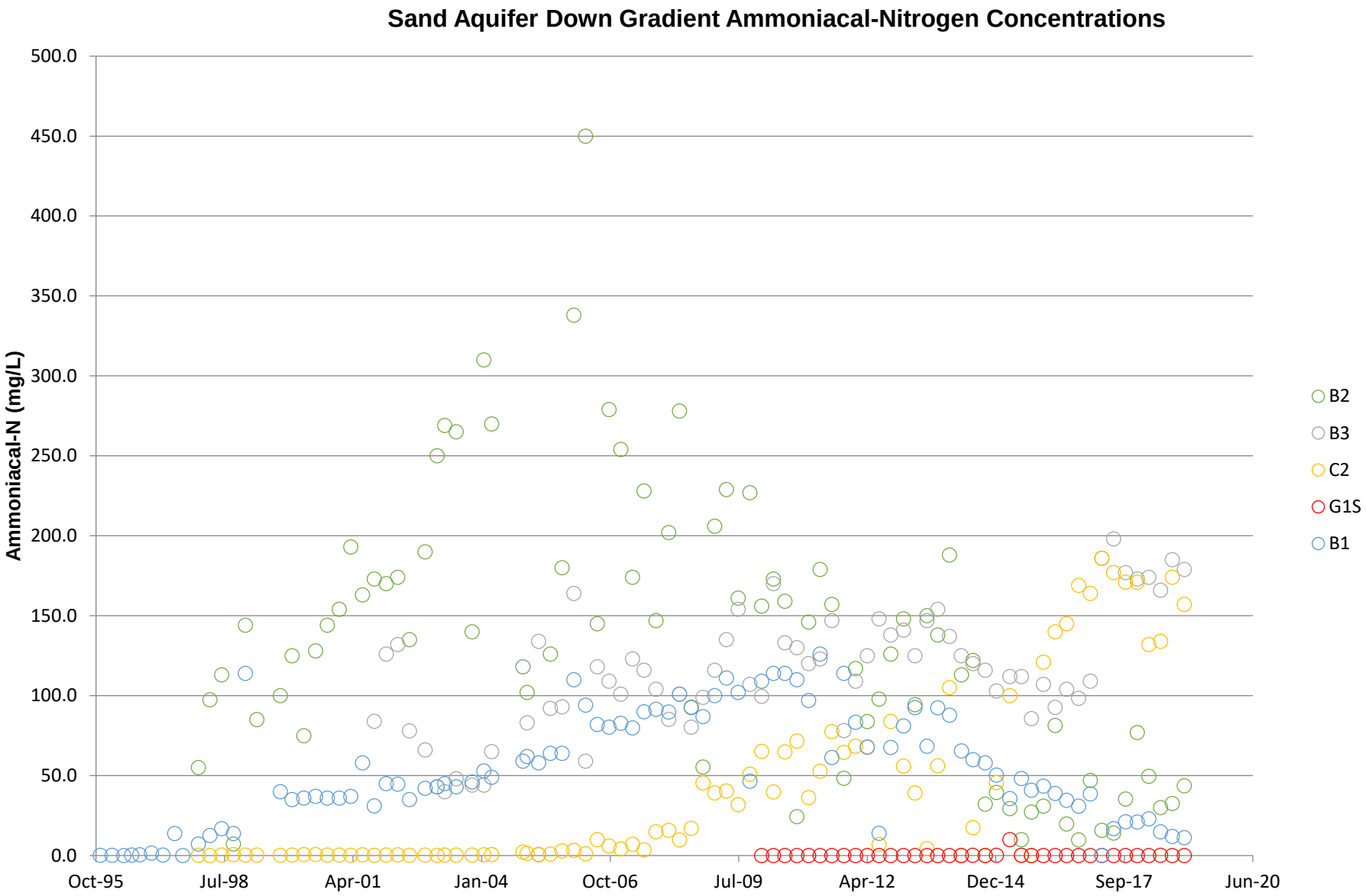

Gravel Aquifer Chloride Concentrations
Chloride (mg/L)
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Oct-95
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
E1D
C2DD
E2D
G1D


Gravel Aquifer Ammoniacal-Nitrogen Concentrations
Ammoniacal-Ni (mg/L)
100.00
10.00
1.00
0.10
0.01
0.00
Oct-95
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
E1D
C2DD
E2D
G1D

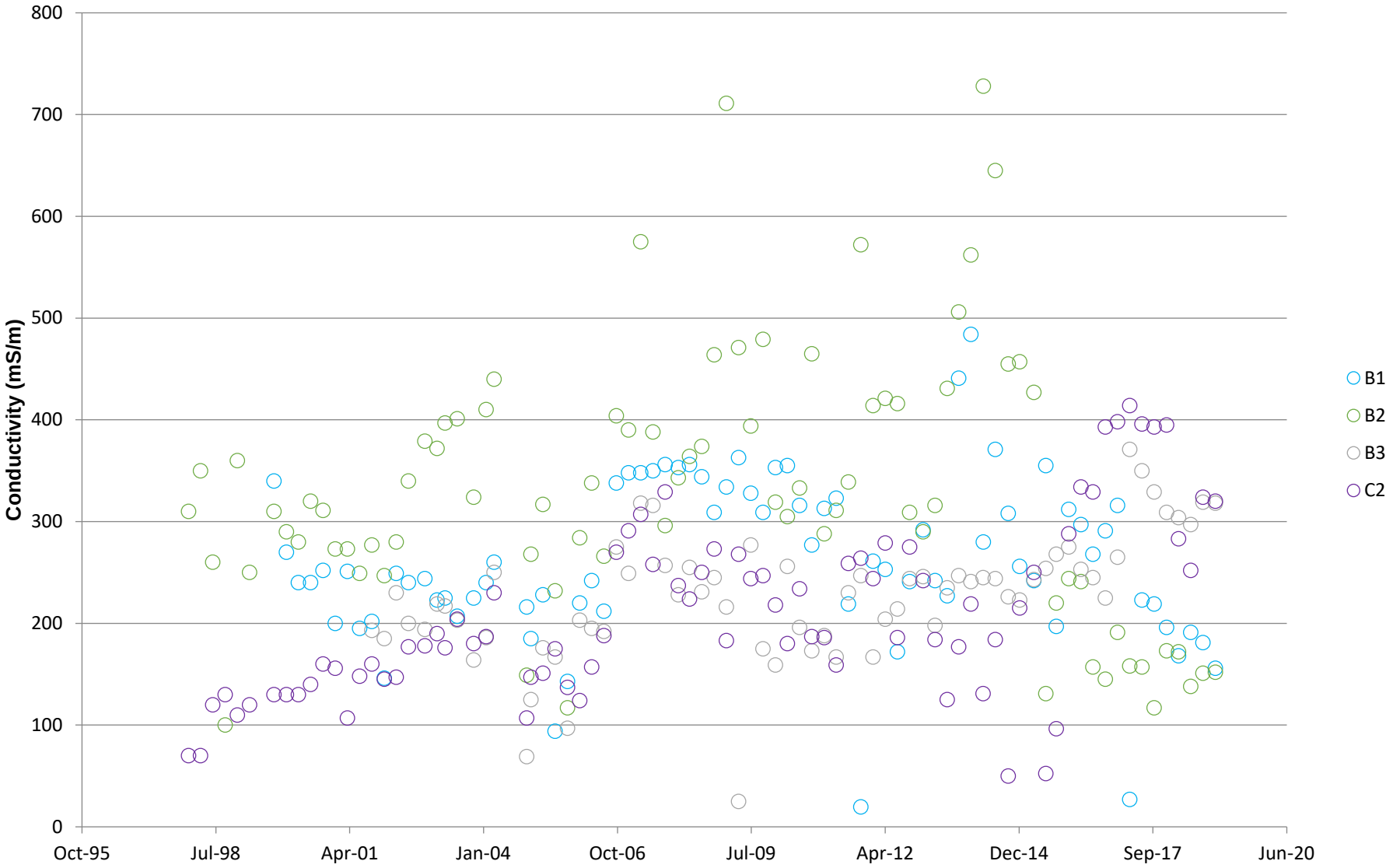

Gravel Aquifer Conductivity Levels
Conductivity (mS/m)
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Oct-95
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
E1D
C2DD
E2D
G1D

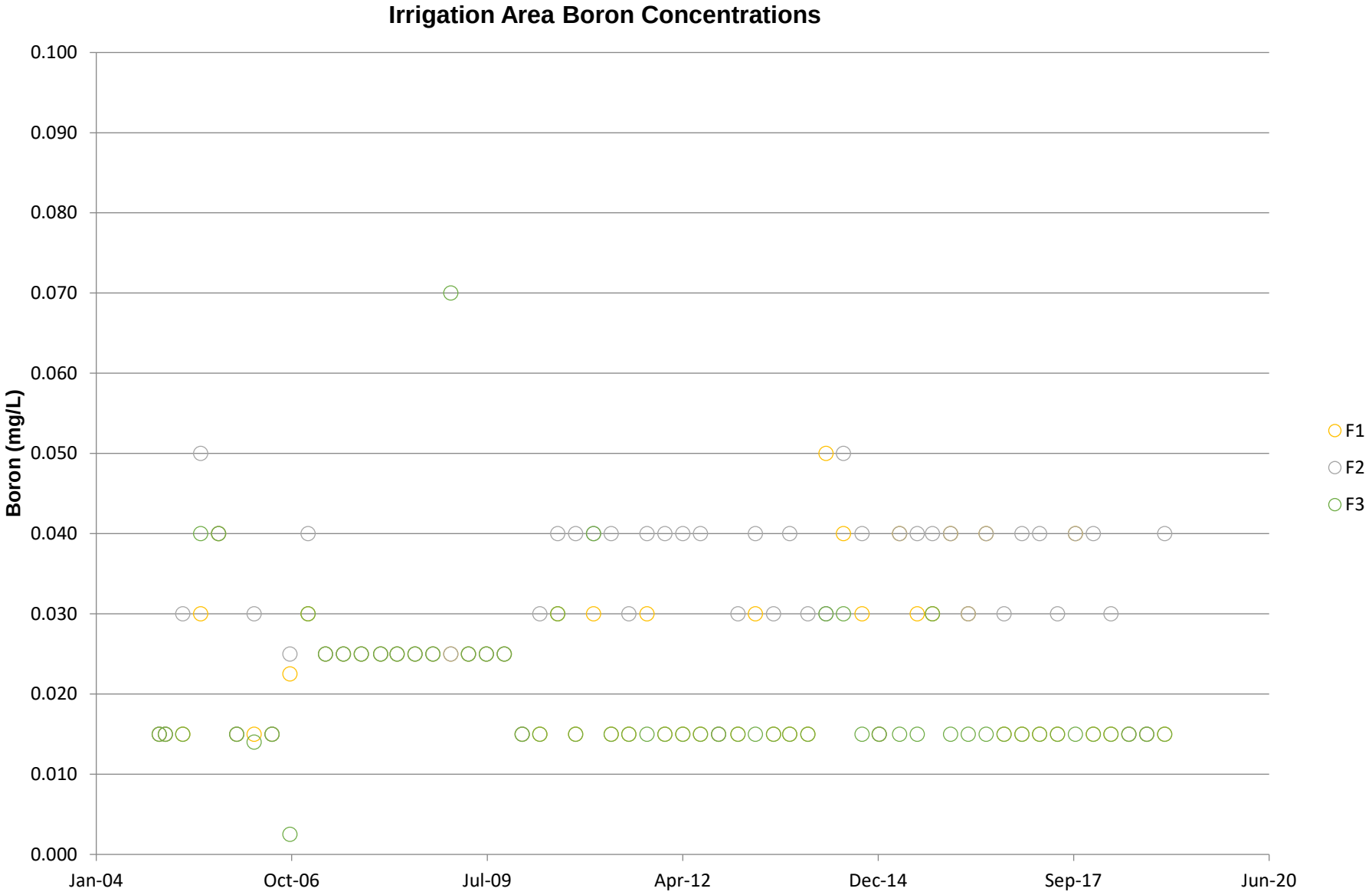

Sand Aquifer Down Gradient Boron Concentrations
Boron (mg/L)
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Oct-95
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
B1
B2
B3
C2

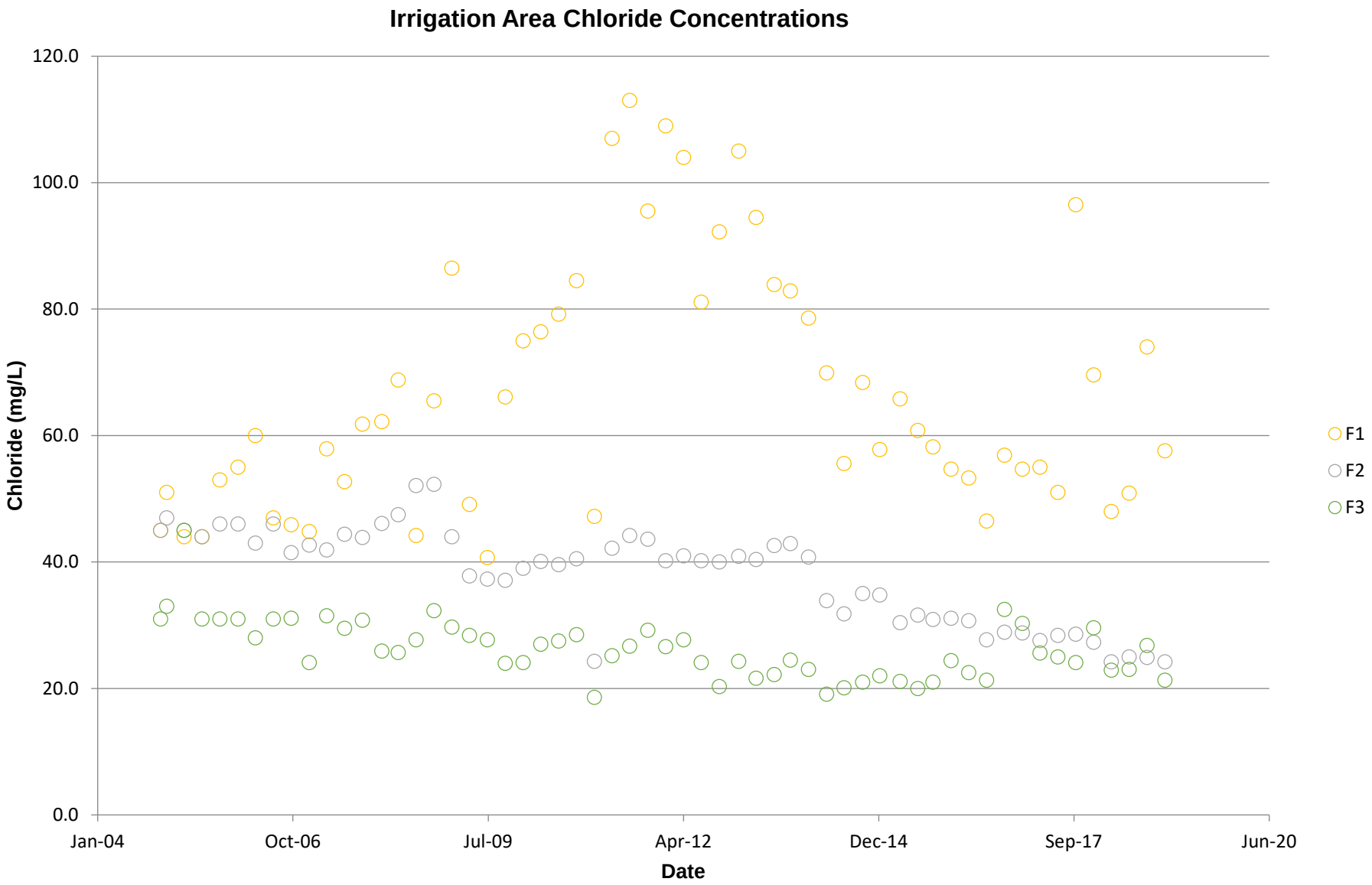

Sand Aquifer Down Gradient Chloride Concentrations
Chloride (mg/L)
2500
2000
1500
1000
500
0
Oct-95
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
B1
B2
B3
C2

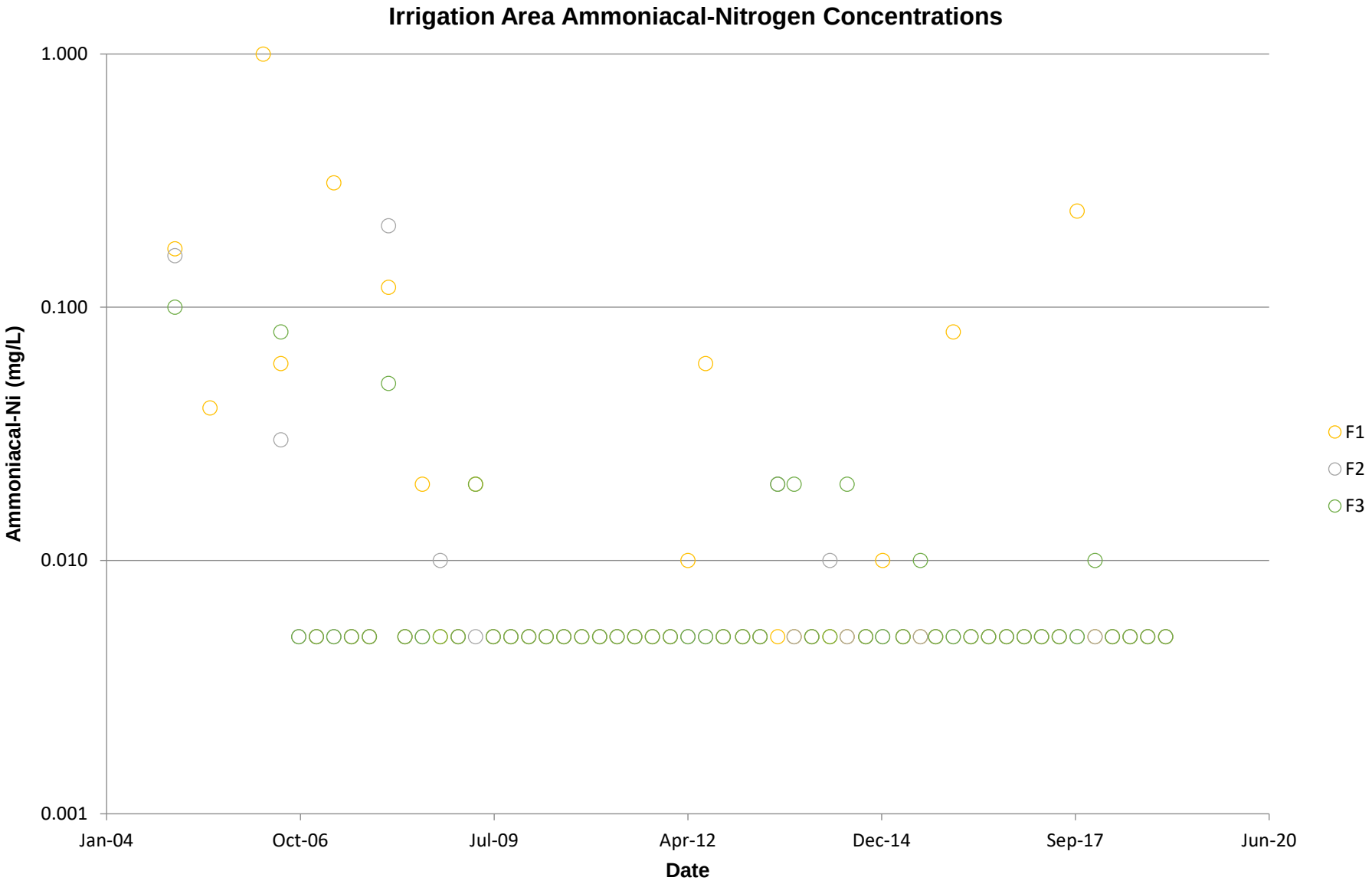

Sand Aquifer Down Gradient Ammoniacal-Nitrogen Concentrations
Ammoniacal-N (mg/L)
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Oct-95
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
B2
B3
C2
G1S
B1

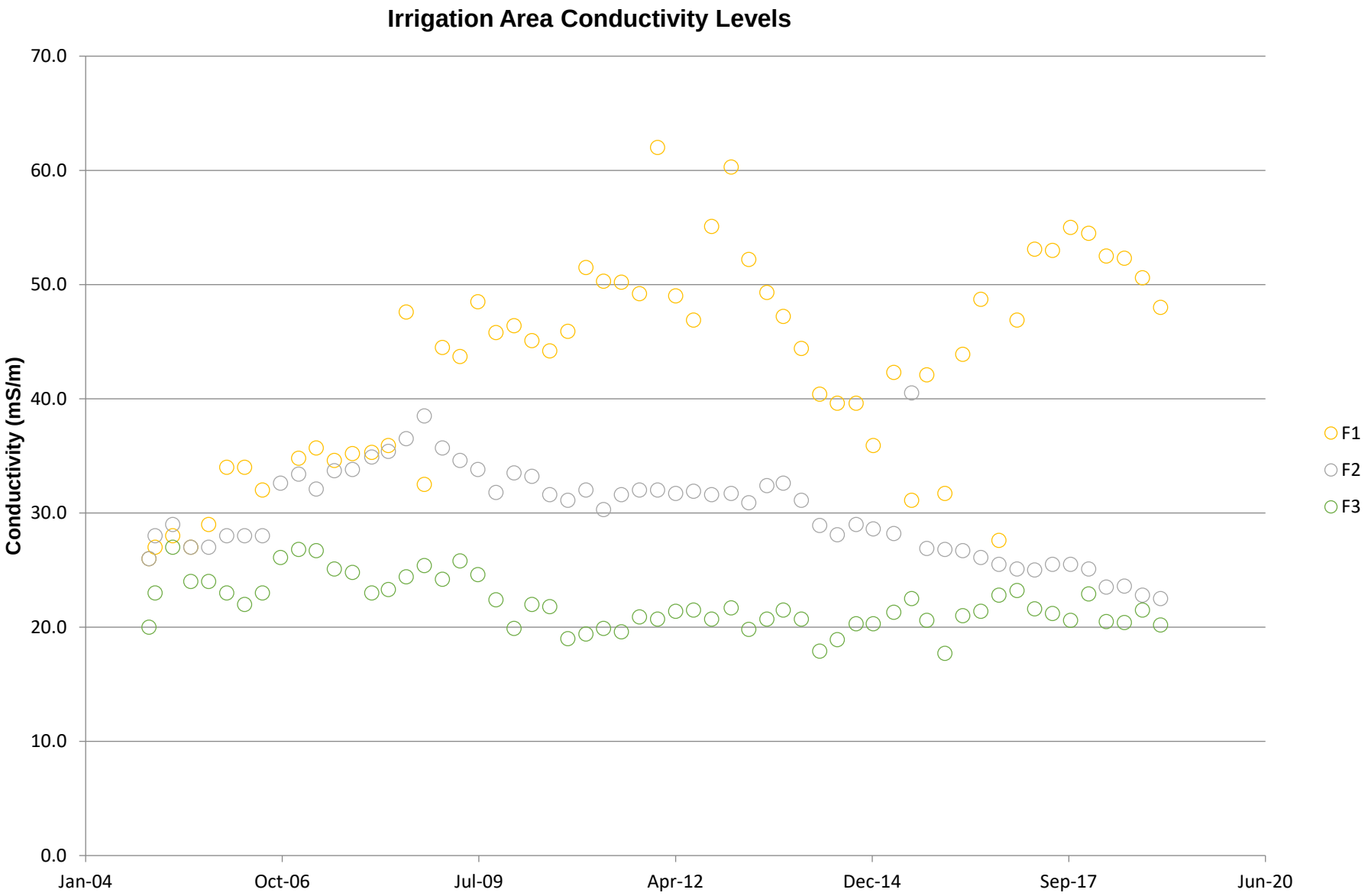
Sand Aquifer Down Gradient Conductivity Levels

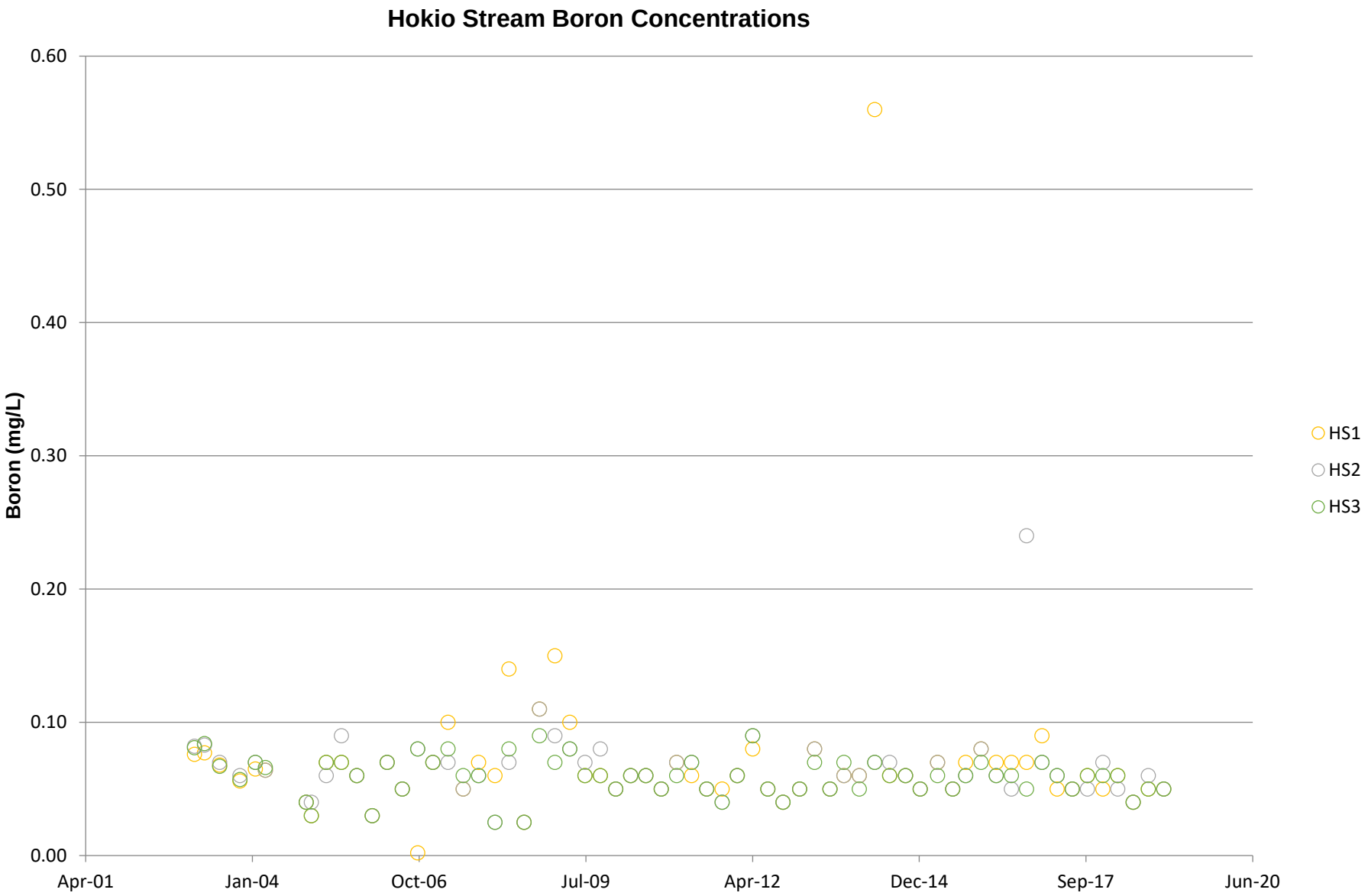


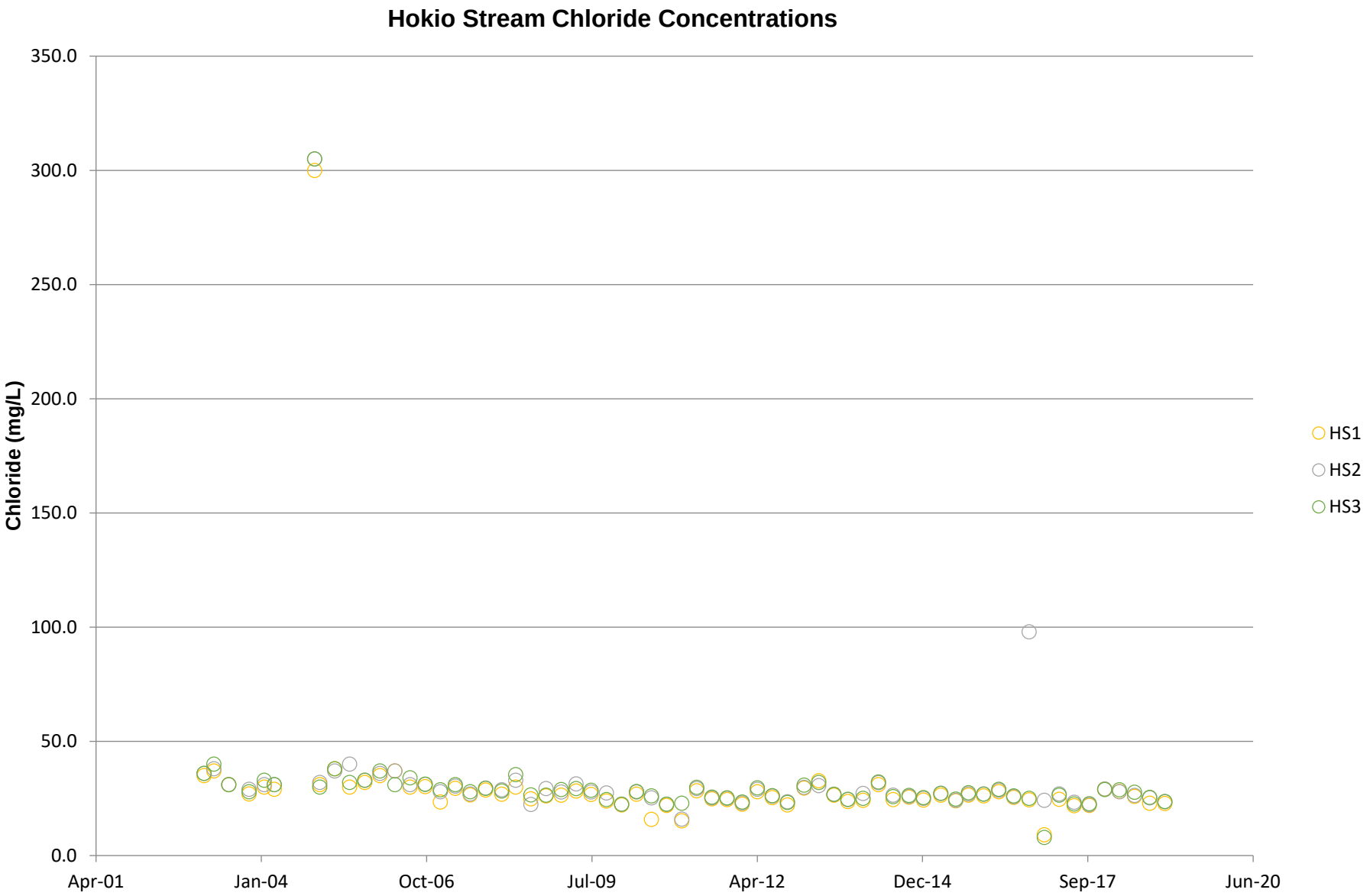

Irrigation Area Boron Concentrations
Boron (mg/L)
0.100
0.090
0.080
0.070
0.060
0.050
0.040
0.030
0.020
0.010
0.000
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
F1
F2
F3

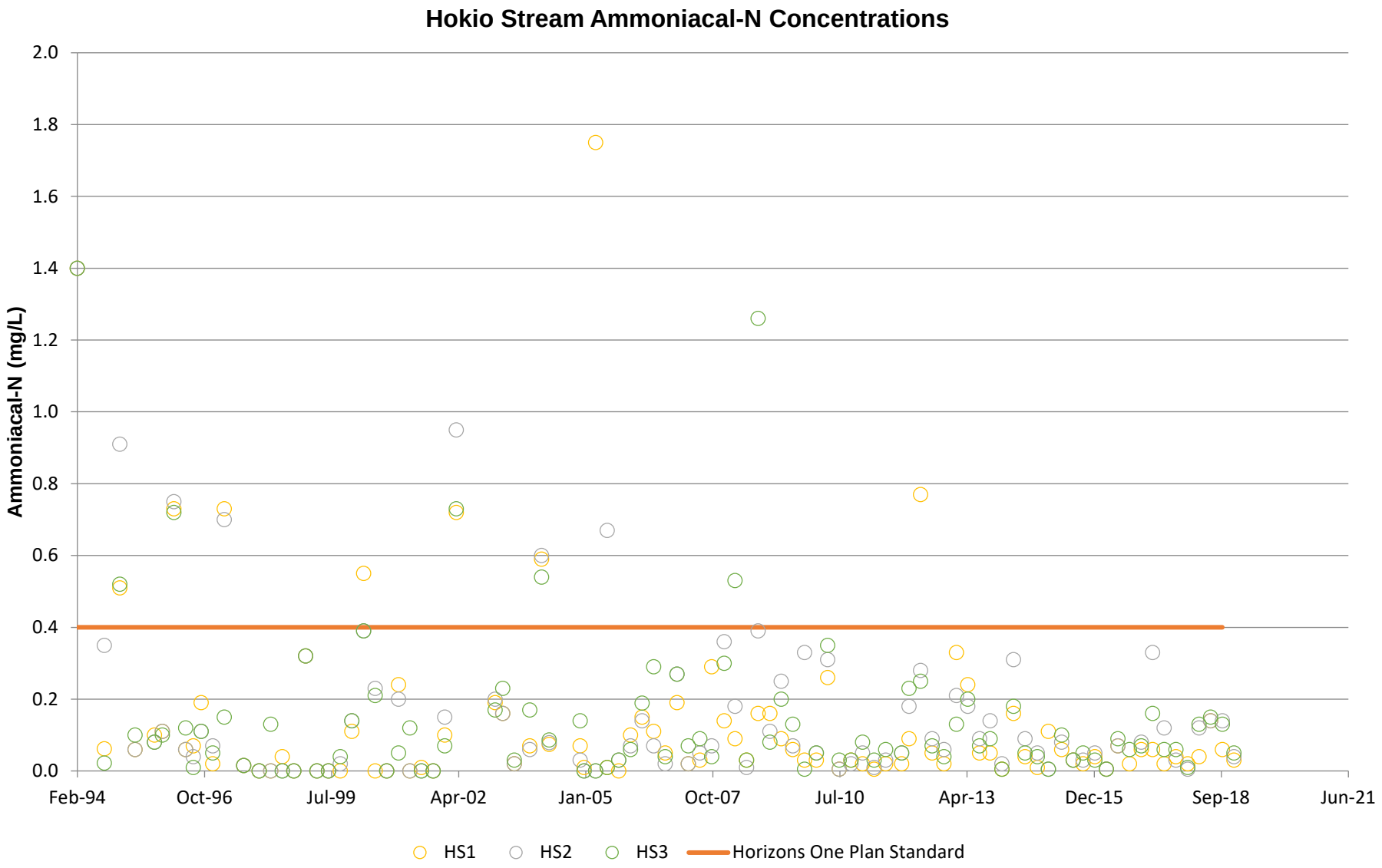

Irrigation Area Chloride Concentrations
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Chloride (mg/L)
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
Date
F1
F2
F3

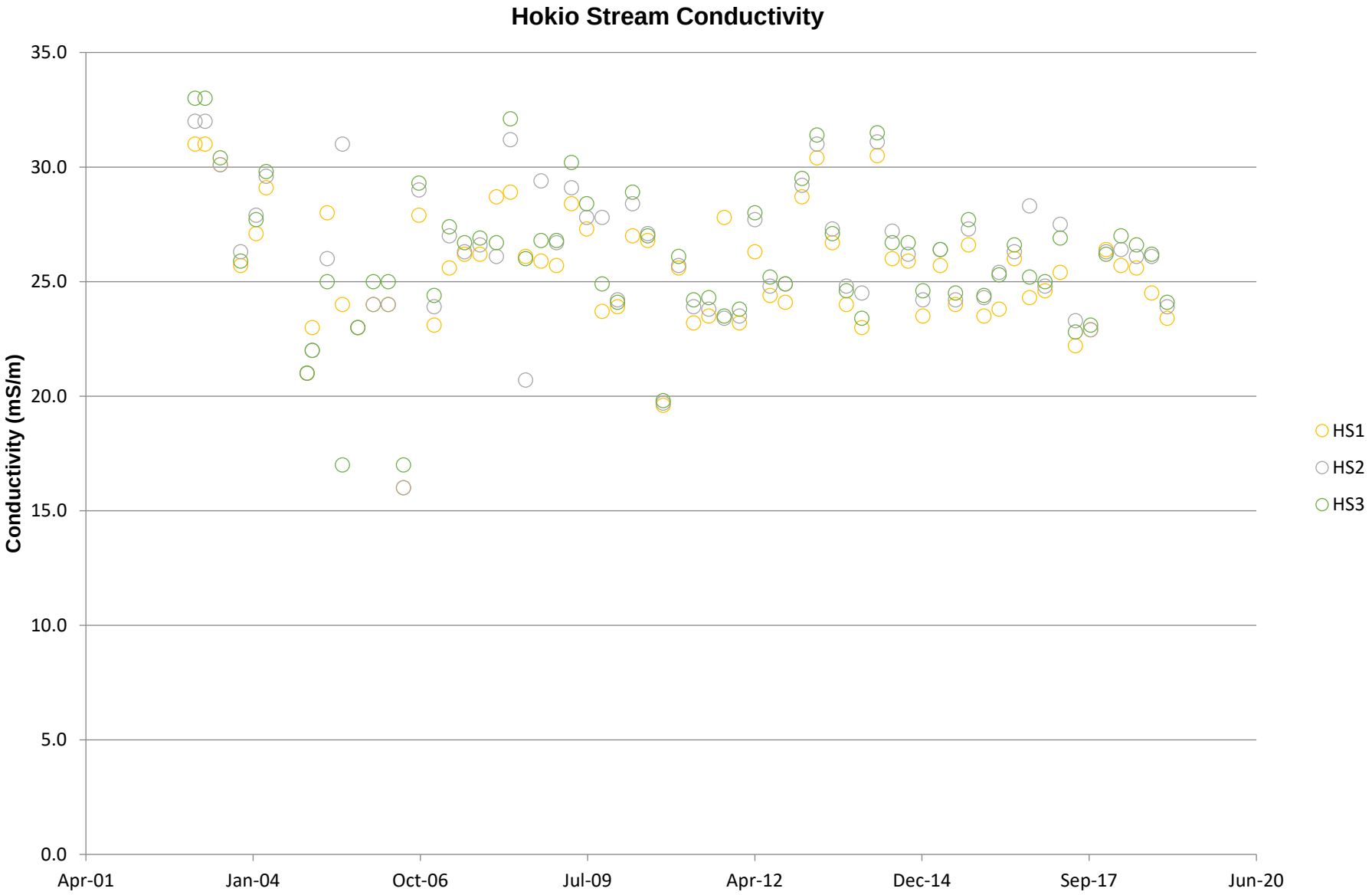

Irrigation Area Ammoniacal-Nitrogen Concentrations
1.000
0.100
0.010
0.001
Ammoniacal-Ni (mg/L)
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
Date
F1
F2
F3


Irrigation Area Conductivity Levels
Conductivity (mS/m)
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
F1
F2
F3


Hokio Stream Boron Concentrations
Boron (mg/L)
0.60
0.50
0.40
0.30
0.20
0.10
0.00
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
HS1
HS2
HS3


Hokio Stream Chloride Concentrations
Chloride (mg/L)
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
HS1
HS2
HS3


Hokio Stream Ammoniacal-N Concentrations
Ammoniacal-N (mg/L)
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
Feb-94
Oct-96
Jul-99
Apr-02
Jan-05
Oct-07
Jul-10
Apr-13
Dec-15
Sep-18
Jun-21
HS1
HS2
HS3
Horizons One Plan Standard


Hokio Stream Conductivity
Conductivity (mS/m)
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
HS1
HS2
HS3

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