NPDC Mangapouri Cemetery

Monitoring Programme
Annual Report
2023/24
Technical Report 2024-07

Taranaki
Regional Council

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Taranaki Regional Council
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Executive summary

New Plymouth District Council (NPDC) operates the Mangapouri Cemetery (the Cemetery) located on Junction Road (SH3) between New Plymouth and Egmont Village, in the Waiwhakaiho Catchment. The Cemetery site is gated and includes an access road, landscaped greens, storage buildings and washroom facilities.

This report for the period July 2023 to June 2024 describes the monitoring programme implemented by Taranaki Regional Council (the Council) to assess NPDC's environmental and consent compliance performance during the period under review. The report also details the results of the monitoring undertaken and assesses the environmental effects of the Company's activities.

During the monitoring period, NPDC demonstrated a good level of environmental performance and high level of administrative performance.

NPDC held one resource consent that allows for the discharge of contaminants into land where it may enter water at this site. These consents include a total of eight conditions setting out the requirements that NPDC must satisfy.

The Cemetery opened to the public in May 2019 and the compliance monitoring programme commenced following the first interment in July 2019. The Council's monitoring programme for the year under review included an annual site inspection, water quality sampling of the receiving waters (groundwater and surface water) and continuous groundwater level monitoring. The monitoring programme also included a significant data review component, with all data submitted by NPDC assessed for compliance upon receipt.

The monitoring showed that the activities were generally being carried out in compliance with the conditions of the resource consent. The results of surface and groundwater quality monitoring undertaken show no adverse effects of the activity on local freshwater resources. Site visits undertaken found the site to be tidy and well managed.

During this monitor year, the high groundwater level issue occurred in Area A caused by huge surface runoff from the north forest hills has been mitigated since a swale and sub-soil drain were installed to effectively convey the stormwater to the northeast wetland.

For reference, in the 2023-2024 year, consent holders were found to achieve a high level of environmental performance and compliance for 864 (89%) of a total of 967 consents monitored through the Taranaki tailored monitoring programmes, while for another 75 (8%) of the consents a good level of environmental performance and compliance was achieved. A further 26 (3%) of consents monitored required improvement in their performance, while the remaining two (<1%) achieved a rating of poor.

In terms of overall environmental and compliance performance by NPDC over the last several years, this report shows that the consent holder's performance remains at a good level.

This report includes recommendations for the 2024/25 year.

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1. Introduction

1.1 Compliance monitoring programme reports and the Resource Management Act 1991

1.1.1 Introduction

This report is for the period July 2023 to June 2024 by Taranaki Regional Council (the Council) on the monitoring programme associated with resource consents held by New Plymouth District Council (NPDC). NPDC operates the Mangapouri Cemetery (the Cemetery) situated on Junction Road (SH3) between New Plymouth and Egmont Village, in the Waiwhakaiho Catchment.

The report includes the results and findings of the monitoring programme implemented by the Council in respect of the consent held by NPDC that relate to discharges to land within the Waiwhakaiho Catchment related to the Cemetery. This report is the 5th annual report to be prepared by the Council to cover NPDC's land discharges and its effects.

1.1.2 Structure of this report

Section 1 of this report is a background section. It sets out general information about:

- consent compliance monitoring under the *Resource Management Act 1991* (RMA) and the Council's obligations;
- the Council's approach to monitoring sites though annual programmes;
- the resource consents held by the Company/companies in the Waiwhakaiho Catchment;
- the nature of the monitoring programme in place for the period under review; and
- a description of the activities and operations conducted in the Company's site/catchment.

Section 2 presents the results of monitoring during the period under review, including scientific and technical data.

Section 3 discusses the results, their interpretations, and their significance for the environment.

Section 4 presents recommendations to be implemented in the 2024/25 monitoring year.

A glossary of common abbreviations and scientific terms, and a bibliography, are presented at the end of the report.

1.1.3 The Resource Management Act 1991 and monitoring

The RMA primarily addresses environmental 'effects' which are defined as positive or adverse, temporary or permanent, past, present or future, or cumulative. Effects may arise in relation to:

a. the neighbourhood or the wider community around an activity, and may include cultural and social-economic effects;
b. physical effects on the locality, including landscape, amenity and visual effects;
c. ecosystems, including effects on plants, animals, or habitats, whether aquatic or terrestrial;
d. natural and physical resources having special significance (for example recreational, cultural, or aesthetic); and
e. risks to the neighbourhood or environment.

In drafting and reviewing conditions on discharge permits, and in implementing monitoring programmes, the Council is recognising the comprehensive meaning of 'effects' in as much as is appropriate for each activity. Monitoring programmes are not only based on existing permit conditions, but also on the obligations of the RMA to assess the effects of the exercise of consents. In accordance with Section 35 of the RMA, the Council undertakes compliance monitoring for consents and rules in regional plans, and maintains an overview of the performance of resource users and consent holders. Compliance monitoring, including both activity and impact monitoring, enables the Council to continually re-evaluate its approach and that of consent holders to resource management and, ultimately, through the refinement of methods and considered responsible resource utilisation, to move closer to achieving sustainable development of the region's resources.

1.1.4 Evaluation of environmental performance

Besides discussing the various details of the performance and extent of compliance by the consent holders, this report also assigns a rating as to each Company's environmental and administrative performance during the period under review. The rating categories are high, good, improvement required and poor for both environmental and administrative performance. The interpretations for these ratings are found in Appendix II.

For reference, in the 2023/24 year, consent holders were found to achieve a high level of environmental performance and compliance for 864 (89%) of a total of 967 consents monitored through the Taranaki tailored monitoring programmes, while for another 75 (8%) of the consents a good level of environmental performance and compliance was achieved. A further 26 (3%) of consents monitored required improvement in their performance, while the remaining two (<1%) achieved a rating of poor. [1]

1.2 Process description

The Mangapouri Cemetery (the Cemetery) is one of three main cemeteries that NPDC operate. The other two are the Awanui and Te Henui cemeteries, located in central New Plymouth. The availability of plots within the Awanui Cemetery is now limited and the Te Henui Cemetery has no more new plots available for purchase. The Cemetery opened to the public in May 2019 and the first interment was undertaken in July 2019.

The Cemetery accepts conventional single plots, natural burials and ashes. Each grave will be centered on an area of $10m^2$, which will result in 1,000 graves per hectare (ha). The first two areas available to the public are Area-A which is 0.8ha in the north of the development, and Area-B which is 0.65ha in the south and west of the development (Figure 1).

To avoid contamination of local surface and groundwater resources, burials are required to occur at a minimum of 0.8m above the high water table. Interments will be spread out in time and space to reduce any risks associated with point source loading.

[1] The Council has used these compliance grading criteria for more than 20 years. They align closely with the 4 compliance grades in the MfE Best Practice Guidelines for Compliance, Monitoring and Enforcement, 2018

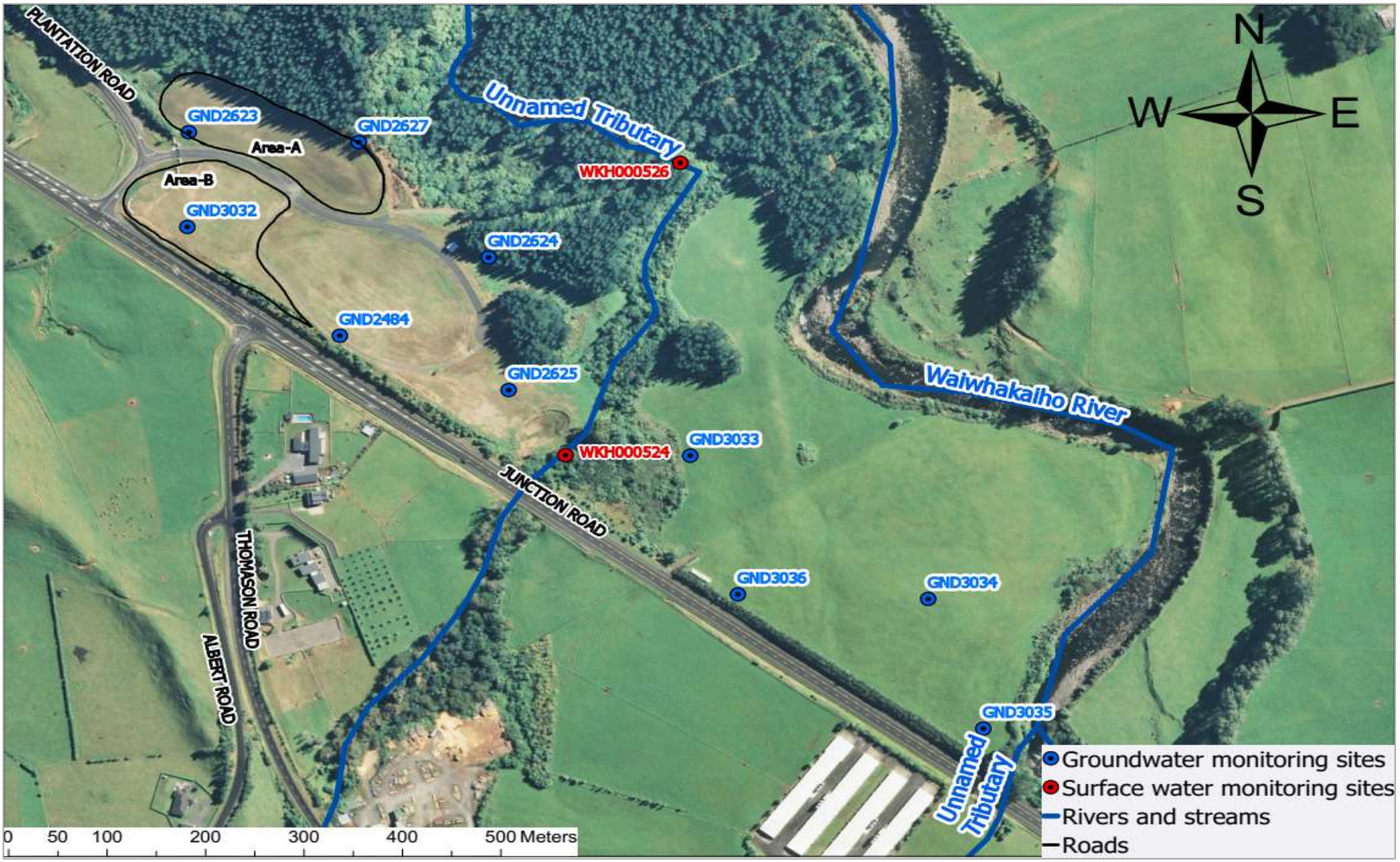

Figure 1 Mangapouri Cemetery location map

1.3 Resource consents

NPDC holds one resource consents in relation to the Cemetery. The details of which are summarised in the table below (Table 1). A summary of the conditions attached to the permit are set out in Section 3 of this report.

A summary of the various consent types issued by the Council is included in Appendix I, as is a copy of the permit held by NPDC that authorises their discharge to land.

Table 1 Summary of resource consents held by NPDC at the Mangapouri Cemetery

Consent number	Purpose	Granted	Review	Expires
Discharges of waste to land				
7882-1.1	To discharge contaminants into land at a cemetery in circumstances where they may enter water	09 Nov 2011	June 2026	01 Jun 2046

1.4 Monitoring programme

1.4.1 Introduction

Section 35 of the RMA sets obligations upon the Council to gather information, monitor and conduct research on the exercise of resource consents within the Taranaki region. The Council is also required to assess the effects arising from the exercising of these consents and report upon them.

The Council may therefore make and record measurements of physical and chemical parameters, take samples for analysis, carry out surveys and inspections, conduct investigations and seek information from consent holders.

The monitoring programme for the Mangapouri Cemetery site consisted of two primary components.

The main environmental impacts associated with the interment of human remains is related to the degradation of human corpses. Degradation normally takes 10-12 years, and it is estimated that more than half the pollutant load leaches within the first year, with loadings reducing by 50% each year thereafter (SEPA, 2015).

The main point source contamination issues related to cemeteries are the following (SEPA, 2015):

- Ammoniacal nitrogen resulting from the breakdown or organic products;
- Pathogens and organisms harmful to human health can be released into the environment if present;
- Formaldehyde, used in embalming fluids and coffin resins and glues is a biocide with toxic and carcinogenic properties;
- Mercury, present in amalgam in dental fillings, is a hazardous substance;
- Phosphates and metal concentrations in ground and surface water resources, present in cremated remains, can increase; and
- Phosphate from the decomposition of skeletal remains.

The monitoring programme included the collection and analysis of a comprehensive suite of general water quality parameters and those contaminants specifically related to the degradation of human remains.

The monitoring programme in relation to the Cemetery is outlined below. The collection of field data was undertaken by Geosearch Ltd, on behalf of NPDC.

1.4.2 Programme liaison and management

There is generally a significant investment of time and resources by the Council in:

- ongoing liaison with resource consent holders over consent conditions and their interpretation and application;
- discussion over monitoring requirements;
- preparation for any consent reviews, renewals or new consent applications;
- advice on the Council's environmental management strategies and content of regional plans; and
- consultation on associated matters.

1.4.3 Site inspections

The Mangapouri cemetery was visited four times during the monitoring period. With regard to consents, the main points of interest during an inspection are to check for signs of water ponding or sediment runoff into local waterways and to survey the area for any potential environmental effects. Sources of data being collected by NPDC were identified and accessed, so that performance in respect of operation, internal monitoring, and supervision could be reviewed by the Council. The neighbourhood was surveyed for environmental effects.

1.4.4 Surface water quality monitoring

Surface water quality samples were collected in an unnamed tributary of the Waiwhakaiho River, at one site upstream and one site downstream of the Cemetery. The samples were obtained during low flow and high flow conditions. The samples were submitted to Hill laboratories (Hills) for analysis.

In addition to the routine sampling, baseline samples were collected prior to the commencement of the activity to allow for an in depth comparison of any variations in surface water composition should the need arise.

The location of surface water monitoring sites are displayed on Figure 1. A description of each site is provided in.

Table 2 Surface water monitoring site details

Site	Eastings	Northings	Description	Location
WKH000524	1697720	5667352	Unnamed tributary of the Waiwhakaiho River	On the cemetery side of Junction Road, downstream of the SH3 culvert
WKH000526	1697837	5667687	Unnamed tributary of the Waiwhakaiho River	320m downstream of SH3 culvert

1.4.5 Groundwater quality monitoring

Groundwater level data was collected using in-situ level loggers from six sites GND2623, GND2624, GND2625, GND2627 GND2484 and GND3032. Loggers recorded water level measurements at 15 minute intervals. Data was downloaded quarterly and submitted to the Council for review.

The location of all groundwater monitoring sites are displayed on Figure 1 and the details of each site included in the monitoring programme are summarised below in Table 3.

Table 3 Groundwater monitoring site details

Site code	id.	Eastings	Northings	bore depth (m)	Screen depth (m)
GND2623	MW1	1697453	5667700	8.0	1.2-8
GND2624	MW2	1697688	5667583	6.0	1.2-6

Site code	id.	Eastings	Northings	bore depth (m)	Screen depth (m)
GND2625	MW3	1697703	5667463	5.6	1.6-5.6
GND2484*	MW4	1697570	5667514	8.0	1.2-8
GND2627	MW5	1697587	5667689	12.0	0-12
GND3032	MW6	1697454	5667601	8.0	4-8

**Note GND2484 is referred to as GND2626 in the burial report referenced in the following sections*

2. Results

2.1 Water

2.1.1 Inspections

An inspection was undertaken by a Council Officer, in conjunction with the Council's shallow groundwater monitoring programme on 12 September 2023, following the construction of a new subsurface drain to intercept overland runoff from the hill. The site appeared to be in good condition and being well managed.

No issues were identified during the inspection or any of the additional three site visits undertaken as part of the Council's quarterly regional shallow groundwater monitoring programme.

2.1.2 Provision of consent holder data

Groundwater levels and ground and surface water quality results were sampled quarterly for review.

NPDC's burial report outlined how they would meet compliance with condition 3 of Consent 7882-1.1, which requires NPDC to adopt the best practicable option, to avoid or minimise any adverse effects on the environment.

The report included the burial plan for the first five years of interments. The burial plan was designed to enable the spreading of burials, in both time and location, in order to reduce point source loading of contaminants (Figure 2). The report provided a map showing which areas were suitable for which type of burial to ensure that all burials will occur no deeper than 0.8m above the seasonally high water table.

The burial plan established that for the first five years of operation only Area-A and Area-B would be utilised. The type of interment recommended for each area was also determined using available groundwater level data and a 1 in 100 year high groundwater elevation scenario.

2.1.3 Results of receiving environment monitoring

The monitoring programme is designed to capture any seasonal changes in groundwater and surface water composition, and fluctuations in groundwater levels. The following sections display and discuss the results.

2.1.3.1 Surface water quality monitoring

Surface water samples were collected and analysed for an extensive suite of parameters during summer and winter/spring flow conditions. Both sites, one upstream and one downstream, are located in the unnamed tributary of the Waiwhakaiho River that flows through the Cemetery site. The results of the baseline analysis in comparison to the more recent sampling carried out are set out below in Table 4 and Table 5. All historic results have been included as Appendix III.

Dissolved reactive phosphorus and total organic carbon show slight fluctuation in this monitoring period, however, summer and winter samples are consistent with the baseline level without apparently seasonal variations in upstream and downstream.

There are also minor differences in some parameters seen between seasons. Commonly, the summer samples exhibit higher total dissolved solids, carbonates and major cation and anions at both sites. The increases in these analytes could be likely linked to sampling time when the summer flow is predominantly influenced by groundwater while in winter season the tributary is mainly recharged by stormwater.

In comparison during the winter and spring when increases in nitrogen species can be seen, a major component of flow will be rainfall runoff received from the predominantly rural surroundings. Additionally, an anomaly was noted in the COD value for the upstream summer sample, which spiked significantly, while no such irregularity was observed in the downstream sample at the same time. This discrepancy has been attributed to sampling-related factors, though further investigation may be needed if the situation recurs.

Overall, no significant changes in surface water quality can be observed between the upstream and downstream sites since monitoring commenced.

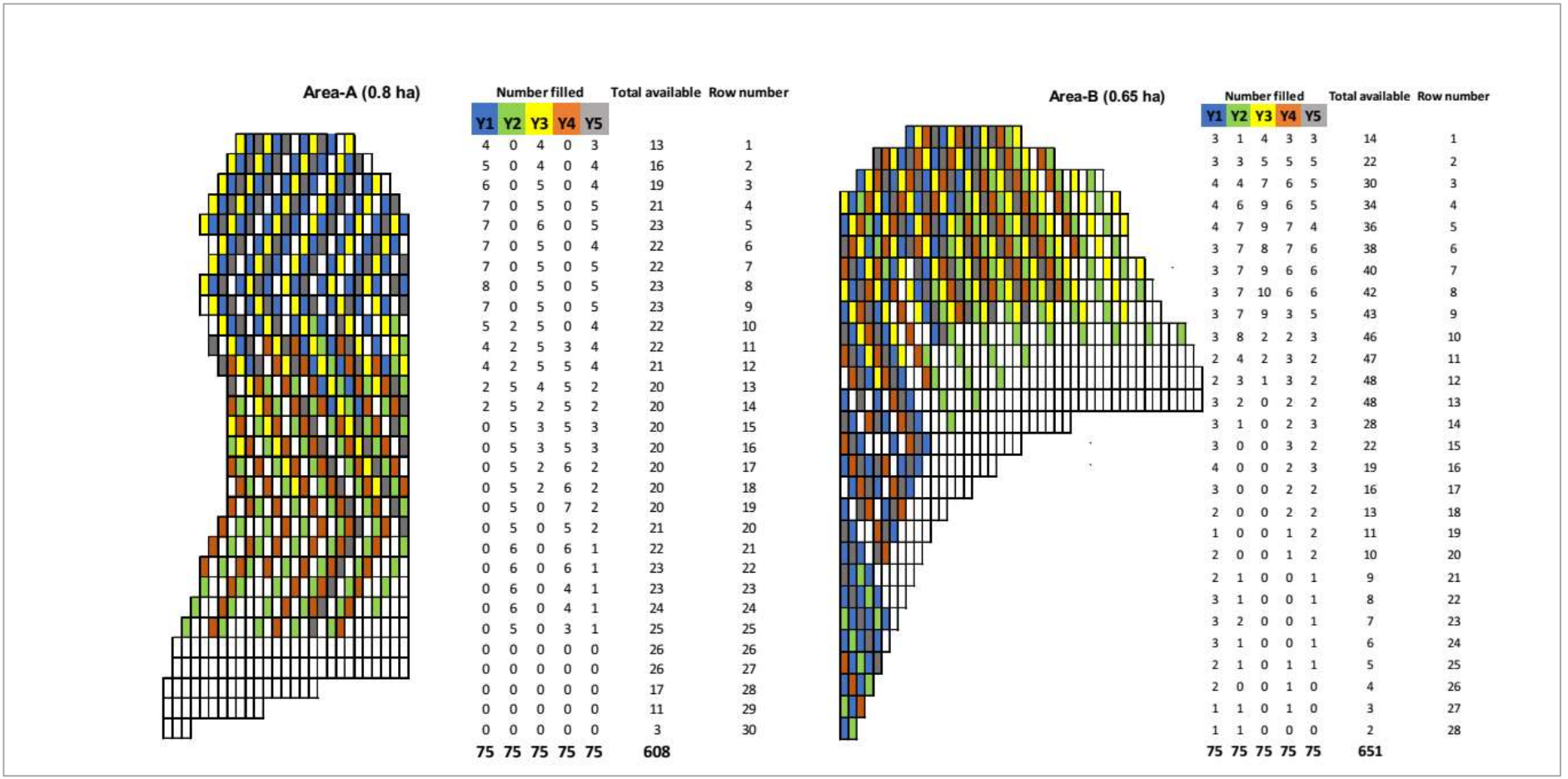

Figure 2 Burial Plan for first five years of operation

Table 4 Surface water quality results-upstream

Parameter	Bore id	WKH000524 upstream					
Duration (year)	-	Baseline (2017/18)		Current year (2023/24)		All years (2017-2024)	
Sample type	Unit	High flow	Low flow	High flow	Low flow	Minimum	Maximum
pH	pH	7.2	7.5	7.4	7.4	6.9	7.7
Total alkalinity	g/m^3 $CaCO_3$	36	76	49	44	29	76
Carbonate	g/m^3 CO_3	< 1.0	< 1.0	< 1.0	< 1.0	<1.0	<1.0
Bicarbonate	g/m^3 HCO_3	44	92	59	53	35	92
Total hardness	g/m^3 $CaCO_3$	43	74	52	50	33	74
Electrical conductivity	mS/m	14	21.5	15.9	15	11.3	21.5
Total suspended solids	g/m^3	< 3	< 3	< 3	< 3	<3	19
Total dissolved solids	g/m^3	95	146	107	95	86	146
Dissolved calcium	g/m^3	10.2	16	12.3	11.5	8.2	16
Dissolved magnesium	g/m^3	4.3	8.2	5.2	5.2	3	8.2
Dissolved potassium	g/m^3	2.9	3.5	2.6	2.6	2.6	3.5
Dissolved sodium	g/m^3	8.9	13.5	9.8	9.9	6.9	13.5
Chloride	g/m^3	12.7	14.5	12.3	12	9.8	14.6
Total nitrogen	g/m^3	1.58	0.79	1.6	1.42	0.79	1.88
Ammoniacal nitrogen	g/m^3	0.057	0.04	0.047	0.044	0.03	0.117
Nitrite nitrogen	g/m^3 N	0.007	0.004	0.003	0.003	0.003	0.009
Nitrate nitrogen	g/m^3 N	1.33	0.63	1.37	1.28	0.63	1.61
Nitrate & nitrite nitrogen	g/m^3 N	1.34	0.63	1.37	1.29	0.63	1.61
Total kjeldahl nitrogen	g/m^3	0.24	0.17	0.23	0.13	<0.10	0.64
Dissolved reactive phosphorus	g/m^3	< 0.004	0.005	< 0.004	< 0.004	<0.004	0.012
Total phosphorus	g/m^3	0.016	0.029	0.01	0.011	0.01	0.103
Sulphate	g/m^3	5.9	7.2	5.8	5.5	4.6	7.2
Biological oxygen demand	g O_2/m^3	< 2	< 2	< 2	< 2 #1	<2	<2
Chemical oxygen demand	g O_2/m^3	< 6	< 6	98	< 6	<6	98
Total organic carbon	g/m^3	0.7	1.3	0.8	1.4	<0.5	6.4
Escherichia coli	MPN / 100mL	> 200	579	186	579	110	2420

Table 5 Surface water quality results-downstream

Parameter	Bore id	WKH000526 downstream					
Duration (year)	-	Baseline (2017/18)		Current year (2023/24)		All years (2017-2024)	
Sample type	Unit	High flow	Low flow	High flow	Low flow	Minimum	Maximum
pH	pH	7.2	7.5	7.5	7.5	6.9	7.8
Total alkalinity	g/m^3 $CaCO_3$	36	76	48	43	28	73
Carbonate	g/m^3 CO_3	< 1.0	< 1.0	< 1.0	< 1.0	0	<1.0
Bicarbonate	g/m^3 HCO_3	44	92	59	53	34	89
Total hardness	g/m^3 $CaCO_3$	43	74	53	50	31	73
Electrical conductivity	µS/cm	140	215	16	14.9	11.1	21.1
Total suspended solids	g/m^3	< 3	< 3	< 3	< 3	5	12
Total dissolved solids	g/m^3	95	146	90	99	75	153
Dissolved calcium	g/m^3	10.2	16	12.5	11.5	7.6	15.5
Dissolved magnesium	g/m^3	4.3	8.2	5.3	5.1	2.8	8.3
Dissolved potassium	g/m^3	2.9	3.5	2.7	2.6	2.6	3.7
Dissolved sodium	g/m^3	8.9	13.5	10	9.8	6.9	13.7
Chloride	g/m^3	12.7	14.5	12.3	12.1	0.0015	0.0015
Total nitrogen	g/m^3	1.58	0.79	1.45	1.37	0.75	1.88
Ammoniacal nitrogen	g/m^3	0.057	0.04	0.016	0.017	0.016	0.194
Nitrite nitrogen	g/m^3 N	0.007	0.004	0.004	0.003	0.002	0.009
Nitrate nitrogen	g/m^3 N	1.33	0.63	1.37	1.24	0.61	1.58
Nitrate & nitrite nitrogen	g/m^3 N	1.34	0.63	1.37	1.24	0.61	1.58
Total kjeldahl nitrogen	g/m^3	0.24	0.17	< 0.10	0.12	0.12	0.7
Dissolved reactive phosphorus	g/m^3	< 0.004	0.005	< 0.004	< 0.004	0.005	0.013
Total phosphorus	g/m^3	0.016	0.029	0.009	0.011	0.009	0.094
Sulphate	g/m^3	5.9	7.2	6.4	5.6	5.6	33
Biological oxygen demand	g O_2/m^3	< 2	< 2	< 2	< 2	0	<2
Chemical oxygen demand	g O_2/m^3	< 6	< 6	< 6	< 6	6	13
Total organic carbon	g/m^3	0.7	1.3	0.7	1.4	0.7	7.2
Escherichia coli	MPN / 100mL	> 200	579	96	345	75	2420

2.1.3.2 Groundwater quality monitoring

Groundwater sampling was undertaken at quarterly intervals during the monitoring year at six sites (GND2623, GND2624, GND2625, GND2484, GND2627 and GND3032). Results are displayed in Table 6 to Table 11. Results are compared to the range of results since monitoring commenced from the year of 2017. All historic results have been included as Appendix III.

Some minor variations in groundwater quality can be observed between bores. GND2624 and GND2484, the two shallowest bores, exhibit slightly higher electrical conductivity and TDS values than the other bores. The higher mineral concentrations indicate that the groundwater intercepted by these two bores may be older and less evolved. Results also point to a highly reducing environment at these two sites, which has led to a decrease in nitrates and an increase in COD and manganese concentrations.

GND3032 was added to the programme in January 2019 to monitor groundwater quality in Area-B of the Cemetery. Groundwater quality in the bore fluctuates but is generally similar to that reported in Area-A.

The majority of bores indicate occasional increases in COD and suspended solids. GND2624 recorded an anomalously high nitrate result in April 2021. It decreased slightly, but the values tested in this review period have reduced to normal.

Occasional increases in some parameters are not uncommon in shallow groundwater with some analytes being easily re-mobilised following rainfall events. The application of fertiliser at the site also has the potential to temporarily increase some parameters. Occasional elevated total suspended solid concentrations have also been reported and may be a result of bore holes being disturbed prior to sampling resulting in the movement of sediment through the slotted screen into the bore casing.

The majority of slight variations in analytic concentrations seen in each bore during the year are a result of seasonal fluctuations and sampling variability.

**Note GND2484 is referred to as GND2626 in the following sections.*

Table 6 Groundwater quality results GND2627-north

Parameter	Bore id.	MW5 (GND2627)					
Sample date	Unit	19/07/2023	7/11/2023	11/01/2024	9/04/2024	Minimum 2017-2024	Maximum 2017-2024
pH	pH	6.1	6.6	6.1	6.2	6.1	6.4
Total alkalinity	g/m^3 $CaCO_3$	28	31	30	35	22	38
Carbonate	g/m^3 CO_3	< 1.0	< 1.0	< 1.0	< 1.0	<1.0	<1.0
Bicarbonate	g/m^3 HCO_3	34	38	37	43	27	46
Total hardness	g/m^3 $CaCO_3$	26	26	27	30	25	43
Electrical conductivity	mS/m	9.1	9.6	9.6	10.7	10.7	17.4
Total suspended solids	g/m^3	< 3	< 3	< 3	< 3	< 1	9
Total dissolved solids	g/m^3	67	73	69	81	67	135
Dissolved aluminium	g/m^3	-	-	< 0.003	-	< 0.003	0.042
Dissolved arsenic	g/m^3	-	-	< 0.0010	-	< 0.0010	< 0.0010
Dissolved barium	g/m^3	-	-	0.011	-	0.007	0.011
Dissolved boron	g/m^3	-	-	0.009	-	0.008	0.011
Dissolved cadmium	g/m^3	-	-	< 0.00005	-	< 0.00005	< 0.00005
Dissolved calcium	g/m^3	5.9	6	6	6.8	4.6	7.3
Dissolved chromium	g/m^3	-	-	0.0006	-	0.0006	0.001
Dissolved copper	g/m^3	-	-	< 0.0005	-	< 0.0005	0.0012
Dissolved iron	g/m^3	-	-	< 0.02	-	< 0.02	0.04
Dissolved lead	g/m^3	-	-	< 0.00010	-	< 0.00010	0.00044
Dissolved magnesium	g/m^3	2.7	2.8	2.9	3.1	2.4	6
Dissolved manganese	g/m^3	-	-	0.0032	-	0.0008	0.006
Dissolved mercury	g/m^3	-	-	< 0.00008	-	< 0.00008	< 0.00008
Dissolved Nickel	g/m^3	-	-	< 0.0005	-	< 0.0005	< 0.0005
Dissolved potassium	g/m^3	1.07	1.11	1.08	1.18	0.53	1.18
Dissolved sodium	g/m^3	8.4	9	9.3	9.7	7.7	15.1
Dissolved zinc	g/m^3	-	-	< 0.0010	-	< 0.0010	0.0074

Parameter	Bore id.	MW5 (GND2627)					
Sample date	Unit	19/07/2023	7/11/2023	11/01/2024	9/04/2024	Minimum 2017-2024	Maximum 2017-2024
Chloride	g/m³	6.8	6.6	6.8	6.9	8	31
Fluoride	g/m³	-	-	< 0.05	-	< 0.05	< 0.05
Total nitrogen	g/m³	< 0.11	0.1	< 0.11	< 0.11	0.12	1.92
Ammoniacal nitrogen	g/m³	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Nitrite nitrogen	g/m³ N	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Nitrate nitrogen	g/m³ N	0.068	0.096	0.089	0.089	0.068	1.92
Nitrate & nitrite nitrogen	g/m³ N	0.068	0.096	0.089	0.089	0.068	1.92
Total kjeldahl nitrogen	g/m³	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dissolved reactive phosphorus	g/m³	0.013	0.017 #1	0.015	0.01	< 0.004	0.017
Dissolved reactive silica	g/m³ SiO_2	-	-	26	-	20	30
Total phosphorus	g/m³	0.013	0.017 #1	0.015	0.015	<0.004	0.017
Sulphate	g/m³	5.2	5.2	4.8	4.9	4.8	7.4
Biological oxygen demand	g O_2/m³	< 2	< 2	< 2 #1	< 2	< 2	< 2
Chemical oxygen demand	g O_2/m³	< 6	< 6	< 6	< 6	< 6	< 6
Total organic carbon	g/m³	0.6	< 0.5	1	< 0.5	< 0.5	1.2
Escherichia coli	MPN/100mL	< 1	< 1	< 1	< 1 #1	< 1	< 1
Formaldehyde	g/m³	-	-	< 0.02	-	< 0.02	< 0.02

Table 7 Groundwater quality results GND2624-north

Parameter	Bore id.	MW2 (GND2624)					
Sample date	Unit	19/07/2023	7/11/2023	11/01/2024	9/04/2024	Minimum 2017-2024	Maximum 2017-2024
pH	pH	6	6.5	6	6.6	6	6.6
Total alkalinity	g/m^3 $CaCO_3$	89	110	89	150	72	180
Carbonate	g/m^3 CO_3	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bicarbonate	g/m^3 HCO_3	109	134	109	183	88	220
Total hardness	g/m^3 $CaCO_3$	112	101	94	120	67	210
Electrical conductivity	mS/m	29.2	28.7	25	35.1	20.2	49.5
Total suspended solids	g/m^3	< 3	< 3	< 3	13	< 3	90
Total dissolved solids	g/m^3	190	185	144	200	131	320
Dissolved aluminium	g/m^3	-	-	< 0.003	-	< 0.003	0.004
Dissolved arsenic	g/m^3	-	-	< 0.0010	-	< 0.0010	< 0.0010
Dissolved barium	g/m^3	-	-	0.071	-	0.072	0.23
Dissolved boron	g/m^3	-	-	0.011	-	0.006	0.011
Dissolved cadmium	g/m^3	-	-	< 0.00005	-	0.0001	0.00016
Dissolved calcium	g/m^3	22	17.8	19.1	23	13.7	69
Dissolved chromium	g/m^3	-	-	< 0.0005	-	< 0.0005	< 0.0005
Dissolved copper	g/m^3	-	-	0.0013	-	0.0011	0.0053
Dissolved iron	g/m^3	-	-	0.05	-	0.07	19.3
Dissolved lead	g/m^3	-	-	< 0.00010	-	< 0.00010	0.00066
Dissolved magnesium	g/m^3	14.1	13.7	11.3	15.3	7.9	17.2
Dissolved manganese	g/m^3	-	-	1.71	-	6.8	29
Dissolved mercury	g/m^3	-	-	< 0.00008	-	< 0.00008	< 0.00008
Dissolved Nickel	g/m^3	-	-	< 0.0005	-	< 0.0005	0.0007
Dissolved potassium	g/m^3	3	4.3	3.2	4.6	3.3	5.7
Dissolved sodium	g/m^3	15.1	16.4	14.1	17.5	11.1	17.9
Dissolved zinc	g/m^3	-	-	0.0028	-	0.0061	0.022

Parameter	Bore id.	MW2 (GND2624)					
Sample date	Unit	19/07/2023	7/11/2023	11/01/2024	9/04/2024	Minimum 2017-2024	Maximum 2017-2024
Chloride	g/m^3	14.1	16.2	14.2	17.8	13.4	22
Fluoride	g/m^3	-	-	< 0.05	-	< 0.05	< 0.05
Total nitrogen	g/m^3	6.7	2.3	1.96	1.96	0.5	13.5
Ammoniacal nitrogen	g/m^3	0.055	0.52	0.177	0.97	0.123	3.2
Nitrite nitrogen	g/m^3 N	< 0.002	< 0.002	0.031	0.005	< 0.002	0.108
Nitrate nitrogen	g/m^3 N	6.4	1.46	1.63	0.122	< 0.002	12.9
Nitrate & nitrite nitrogen	g/m^3 N	6.4	1.46	1.66	0.127	< 0.002	13
Total kjeldahl nitrogen	g/m^3	0.22	0.87	0.3	1.83	0.33	4.1
Dissolved reactive phosphorus	g/m^3	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004
Dissolved reactive silica	g/m^3 SiO_2	-	-	17	-	15.5	21
Total phosphorus	g/m^3	0.002	0.003	0.002	0.006	0.002	0.09
Sulphate	g/m^3	9	6.9	7.3	6.4	7	70
Biological oxygen demand	g O_2/m^3	< 2	< 2	< 2	< 2	< 2	< 2
Chemical oxygen demand	g O_2/m^3	< 6	< 6	< 6	10	< 6	14
Total organic carbon	g/m^3	4.1	< 0.5	1	1.6	< 0.5	8.2
Escherichia coli	MPN/100mL	< 1	< 1	< 1	< 1 #1	< 1	1
Formaldehyde	g/m^3	-	-	< 0.02	-	< 0.02	< 0.02

Table 8 Groundwater quality results GND2625-east

Parameter	Bore id.	MW3 (GND2625)					
Sample date	Unit	19/07/2023	07/11/2023	11/01/2024	09/04/2024	Minimum 2017-2024	Maximum 2017-2024
pH	pH	6.1	6.4	6.1	6.2	6	6.6
Total alkalinity	g/m^3 $CaCO_3$	22	26	19.4	30	19.4	180
Carbonate	g/m^3 CO_3	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bicarbonate	g/m^3 HCO_3	27	31	24	36	24	220
Total hardness	g/m^3 $CaCO_3$	47	39	36	40	36	210
Electrical conductivity	mS/m	16.6	15.6	13.2	16.1	13.2	49.5
Total suspended solids	g/m^3	< 3	< 3	< 3	< 3	< 3	90
Total dissolved solids	g/m^3	102	88	73	111	73	320
Dissolved aluminium	g/m^3	-	-	< 0.003	-	< 0.003	0.004
Dissolved arsenic	g/m^3	-	-	< 0.0010	-	< 0.0010	< 0.0010
Dissolved barium	g/m^3	-	-	0.007	-	0.007	0.23
Dissolved boron	g/m^3	-	-	0.006	-	0.006	0.011
Dissolved cadmium	g/m^3	-	-	< 0.00005	-	< 0.00005	0.00016
Dissolved calcium	g/m^3	7.6	6.6	5.5	7.4	5.5	69
Dissolved chromium	g/m^3	-	-	0.0008	-	< 0.0005	0.0008
Dissolved copper	g/m^3	-	-	< 0.0005	-	< 0.0005	0.0053
Dissolved iron	g/m^3	-	-	35	-	< 0.02	35
Dissolved lead	g/m^3	-	-	< 0.00010	-	< 0.00010	0.00066
Dissolved magnesium	g/m^3	6.9	5.4	5.3	5.2	5.2	17.2
Dissolved manganese	g/m^3	-	-	0.0006	-	0.0006	29
Dissolved mercury	g/m^3	-	-	< 0.00008	-	< 0.00008	< 0.00008
Dissolved Nickel	g/m^3	-	-	< 0.0005	-	< 0.0005	0.0007
Dissolved potassium	g/m^3	0.69	0.75	0.6	0.86	0.6	5.7
Dissolved sodium	g/m^3	13.4	14.9	12.5	16	11.1	17.9
Dissolved zinc	g/m^3	-	-	0.0014	-	0.0014	0.022

Parameter	Bore id.	MW3 (GND2625)					
Sample date	Unit	19/07/2023	07/11/2023	11/01/2024	09/04/2024	Minimum 2017-2024	Maximum 2017-2024
Chloride	g/m^3	29	25	19.8	26	13.4	29
Fluoride	g/m^3	-	-	< 0.05	-	< 0.05	< 0.05
Total nitrogen	g/m^3	0.66	0.62	0.95	0.61	0.5	13.5
Ammoniacal nitrogen	g/m^3	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	3.2
Nitrite nitrogen	g/m^3 N	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.108
Nitrate nitrogen	g/m^3 N	0.63	0.6	0.93	0.57	< 0.002	12.9
Nitrate & nitrite nitrogen	g/m^3 N	0.63	0.6	0.93	0.57	< 0.002	13
Total kjeldahl nitrogen	g/m^3	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	4.1
Dissolved reactive phosphorus	g/m^3	< 0.004	0.006	< 0.004	0.006	< 0.004	0.006
Dissolved reactive silica	g/m^3 SiO_2	-	-	17	-	15.5	21
Total phosphorus	g/m^3	0.002	0.006	0.002	0.006	0.002	0.09
Sulphate	g/m^3	5.4	5.1	6.4	4.4	4.4	70
Biological oxygen demand	g O_2/m^3	< 2	< 2	< 2 #1	< 2	< 2	< 2
Chemical oxygen demand	g O_2/m^3	< 6	< 6	< 6	< 6	< 6	14
Total organic carbon	g/m^3	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	8.2
Escherichia coli	MPN/100mL	< 1	< 1	< 1	< 1	< 1	1
Formaldehyde	g/m^3	-	-	< 0.02	-	< 0.02	< 0.02

Table 9 Groundwater quality results GND3032-south

Parameter	Bore id.	MW6 (GND3032)					
Sample date	Unit	19/07/2023	7/11/2023	11/01/2024	9/04/2024	Minimum 2017-2024	Maximum 2017-2024
pH	pH	6.2	6.7	6	6	6	6.7
Total alkalinity	g/m^3 $CaCO_3$	50	47	47	48	19.4	180
Carbonate	g/m^3 CO_3	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bicarbonate	g/m^3 HCO_3	61	57	58	59	24	220
Total hardness	g/m^3 $CaCO_3$	53	47	49	53	36	210
Electrical conductivity	mS/m	15.7	14.7	15.3	15.8	13.2	49.5
Total suspended solids	g/m^3	< 3	< 3	< 3	< 3	< 3	90
Total dissolved solids	g/m^3	112	102	100	111	73	320
Dissolved aluminium	g/m^3	-	-	< 0.003	-	< 0.003	0.004
Dissolved arsenic	g/m^3	-	-	< 0.0010	-	< 0.0010	< 0.0010
Dissolved barium	g/m^3	-	-	0.019	-	0.007	0.23
Dissolved boron	g/m^3	-	-	0.013	-	0.006	0.013
Dissolved cadmium	g/m^3	-	-	< 0.00005	-	< 0.00005	0.00016
Dissolved calcium	g/m^3	12.6	11.1	11.4	12.5	5.5	69
Dissolved chromium	g/m^3	-	-	0.0008	-	< 0.0005	0.0008
Dissolved copper	g/m^3	-	-	< 0.0005	-	< 0.0005	0.0053
Dissolved iron	g/m^3	-	-	< 0.02	-	< 0.02	19.3
Dissolved lead	g/m^3	-	-	< 0.00010	-	< 0.00010	0.00066
Dissolved magnesium	g/m^3	5.1	4.6	4.9	5.2	4.6	17.2
Dissolved manganese	g/m^3	-	-	0.0038	-	0.0006	29
Dissolved mercury	g/m^3	-	-	< 0.00008	-	< 0.00008	< 0.00008
Dissolved Nickel	g/m^3	-	-	< 0.0005	-	< 0.0005	0.0007
Dissolved potassium	g/m^3	1.41	1.42	1.45	1.59	0.6	5.7
Dissolved sodium	g/m^3	12.1	11.2	11.7	12.8	11.1	17.9
Dissolved zinc	g/m^3	-	-	0.0021	-	0.0014	0.022

Parameter	Bore id.	MW6 (GND3032)					
Sample date	Unit	19/07/2023	7/11/2023	11/01/2024	9/04/2024	Minimum 2017-2024	Maximum 2017-2024
Chloride	g/m^3	9.2	9.6	9.6	10.6	9.2	29
Fluoride	g/m^3	-	-	< 0.05	-	< 0.05	< 0.05
Total nitrogen	g/m^3	0.99	1.25	1.11	1.83	0.5	13.5
Ammoniacal nitrogen	g/m^3	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	3.2
Nitrite nitrogen	g/m^3 N	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.108
Nitrate nitrogen	g/m^3 N	0.97	1.23	1.11	1.78	< 0.002	12.9
Nitrate & nitrite nitrogen	g/m^3 N	0.97	1.23	1.11	1.78	< 0.002	13
Total kjeldahl nitrogen	g/m^3	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	4.1
Dissolved reactive phosphorus	g/m^3	0.006	0.010	0.007	< 0.004	< 0.004	0.01
Dissolved reactive silica	g/m^3 SiO_2	-	-	28	-	15.5	28
Total phosphorus	g/m^3	0.006	0.009	0.008	0.003	0.002	0.09
Sulphate	g/m^3	7.1	5	5.8	4.3	4.3	70
Biological oxygen demand	g O_2/m^3	< 2	< 2	< 2 #1	< 2	< 2	< 2
Chemical oxygen demand	g O_2/m^3	< 6	< 6	< 6	< 6	< 6	14
Total organic carbon	g/m^3	2	< 0.5	< 0.5	0.9	< 0.5	8.2
Escherichia coli	MPN/100mL	< 1	< 1	< 1	< 1	< 1	1
Formaldehyde	g/m^3	-	-	< 0.02	-	< 0.02	< 0.02

Table 10 Groundwater quality results GND2484-south

Parameter	Bore id.	MW4 (GND2484)					
Sample date	Unit	19/07/2023	7/11/2023	11/01/2024	9/04/2024	Minimum 2017-2024	Maximum 2017-2024
pH	pH	6.3	6.7	6.6	6.4	6	6.7
Total alkalinity	g/m^3 $CaCO_3$	88	113	151	139	19.4	180
Carbonate	g/m^3 CO_3	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bicarbonate	g/m^3 HCO_3	108	137	184	169	24	220
Total hardness	g/m^3 $CaCO_3$	80	81	92	88	36	210
Electrical conductivity	mS/m	21.8	25.9	32.8	33.2	13.2	49.5
Total suspended solids	g/m^3	15	27	34	18	< 3	90
Total dissolved solids	g/m^3	120	149	173	181	73	320
Dissolved aluminium	g/m^3	-	-	< 0.003	-	< 0.003	0.004
Dissolved arsenic	g/m^3	-	-	< 0.0010	-	< 0.0010	< 0.0010
Dissolved barium	g/m^3	-	-	0.184	-	0.007	0.23
Dissolved boron	g/m^3	-	-	0.007	-	0.006	0.013
Dissolved cadmium	g/m^3	-	-	< 0.00005	-	< 0.00005	0.00016
Dissolved calcium	g/m^3	21	21	22	19.9	5.5	69
Dissolved chromium	g/m^3	-	-	< 0.0005	-	< 0.0005	0.0008
Dissolved copper	g/m^3	-	-	0.0014	-	< 0.0005	0.0053
Dissolved iron	g/m^3	-	-	< 0.02	-	< 0.02	35
Dissolved lead	g/m^3	-	-	< 0.00010	-	< 0.00010	0.00066
Dissolved magnesium	g/m^3	6.6	7.2	9	9.4	4.6	17.2
Dissolved manganese	g/m^3	-	-	20	-	0.0006	29
Dissolved mercury	g/m^3	-	-	< 0.00008	-	< 0.00008	< 0.00008
Dissolved Nickel	g/m^3	-	-	0.0005	-	< 0.0005	0.0007
Dissolved potassium	g/m^3	4	4.6	5	5.2	0.6	5.7
Dissolved sodium	g/m^3	6.7	8	9.5	10.1	11.1	17.9

Parameter	Bore id.	MW4 (GND2484)					
Sample date	Unit	19/07/2023	7/11/2023	11/01/2024	9/04/2024	Minimum 2017-2024	Maximum 2017-2024
Dissolved zinc	g/m^3	-	-	0.038	-	0.0014	0.038
Chloride	g/m^3	8	9.1	9.6	10.1	9.2	29
Fluoride	g/m^3	-	-	< 0.02	-	< 0.02	< 0.05
Total nitrogen	g/m^3	1.5	1.36	1.96	1.8	0.5	13.5
Ammoniacal nitrogen	g/m^3	0.68	1.12	1.74	1.51	< 0.010	3.2
Nitrite nitrogen	g/m^3 N	0.01	< 0.02	< 0.02	< 0.02	< 0.002	0.108
Nitrate nitrogen	g/m^3 N	0.21	< 0.02	< 0.02	< 0.02	< 0.002	12.9
Nitrate & nitrite nitrogen	g/m^3 N	0.22	< 0.02	< 0.02	< 0.02	< 0.002	13
Total kjeldahl nitrogen	g/m^3	1.29	1.36	1.96	1.8	< 0.10	4.1
Dissolved reactive phosphorus	g/m^3	< 0.004	< 0.004	< 0.004	< 0.04	< 0.004	0.01
Dissolved reactive silica	g/m^3 SiO_2	-	-	14.4	-	15.5	28
Total phosphorus	g/m^3	0.001	0.009	0.006	0.006	0.001	14.4
Sulphate	g/m^3	7.7	8	7.4	8.7	4.3	70
Biological oxygen demand	g O_2/m^3	3	< 2	< 2	2	< 2	2
Chemical oxygen demand	g O_2/m^3	7	< 6	6	14	< 6	14
Total organic carbon	g/m^3	2.8	< 5	2.1	1.2	< 0.5	8.2
Escherichia coli	MPN/100mL	< 1	< 1	1	< 1	< 1	1
Formaldehyde	g/m^3	-	-	< 0.02	-	< 0.02	< 0.02

Table 11 Groundwater quality results GND2623-west

Parameter	Bore id.	MW1 (GND2623)					
Sample date	Unit	19/07/2023	7/11/2023	11/01/2024	9/04/2024	Minimum 2017-2024	Maximum 2017-2024
pH	pH	6	6.5	6.1	6	6	6.7
Total alkalinity	g/m^3 $CaCO_3$	45	46	43	54	19.4	180
Carbonate	g/m^3 CO_3	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bicarbonate	g/m^3 HCO_3	55	56	52	66	24	220
Total hardness	g/m^3 $CaCO_3$	40	33	37	50	33	210
Electrical conductivity	mS/m	12.9	12.6	12.5	16	12.5	49.5
Total suspended solids	g/m^3	< 3	< 3	< 3	< 3	< 3	90
Total dissolved solids	g/m^3	86	96	81	104	73	320
Dissolved aluminium	g/m^3	-	-	< 0.003	-	< 0.003	0.004
Dissolved arsenic	g/m^3	-	-	< 0.0010	-	< 0.0010	< 0.0010
Dissolved barium	g/m^3	-	-	0.008	-	0.007	0.23
Dissolved boron	g/m^3	-	-	0.011	-	0.006	0.013
Dissolved cadmium	g/m^3	-	-	< 0.00005	-	< 0.00005	0.00016
Dissolved calcium	g/m^3	9.9	7.9	8.9	11.8	5.5	69
Dissolved chromium	g/m^3	-	-	< 0.0005	-	< 0.0005	0.0008
Dissolved copper	g/m^3	-	-	0.0008	-	< 0.0005	0.0053
Dissolved iron	g/m^3	-	-	< 0.02	-	< 0.02	35
Dissolved lead	g/m^3	-	-	< 0.00010	-	< 0.00010	0.00066
Dissolved magnesium	g/m^3	3.8	3.3	3.6	5.1	3.3	17.2
Dissolved manganese	g/m^3	-	-	0.0011	-	0.0006	29
Dissolved mercury	g/m^3	-	-	< 0.00008	-	< 0.00008	< 0.00008
Dissolved Nickel	g/m^3	-	-	< 0.0005	-	< 0.0005	0.0007
Dissolved potassium	g/m^3	1.5	1.42	1.43	1.7	0.6	5.7
Dissolved sodium	g/m^3	10.9	14.1	12.8	14.2	10.9	17.9

Parameter	Bore id.	MW1 (GND2623)					
Sample date	Unit	19/07/2023	7/11/2023	11/01/2024	9/04/2024	Minimum 2017-2024	Maximum 2017-2024
Dissolved zinc	g/m^3	-	-	0.0014	-	0.0014	0.038
Chloride	g/m^3	7.4	6.3	7.5	8.5	6.3	29
Fluoride	g/m^3	-	-	< 0.05	-	< 0.02	< 0.05
Total nitrogen	g/m^3	0.67	0.41	0.57	1.6	0.41	13.5
Ammoniacal nitrogen	g/m^3	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	3.2
Nitrite nitrogen	g/m^3 N	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.108
Nitrate nitrogen	g/m^3 N	0.64	0.39	0.54	1.52	< 0.002	12.9
Nitrate & nitrite nitrogen	g/m^3 N	0.64	0.39	0.54	1.52	< 0.002	13
Total kjeldahl nitrogen	g/m^3	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	4.1
Dissolved reactive phosphorus	g/m^3	0.009	0.016	0.009	0.011	< 0.004	0.01
Dissolved reactive silica	g/m^3 SiO_2	-	-	24	-	15.5	28
Total phosphorus	g/m^3	0.011	0.015	0.009	0.011	0.001	14.4
Sulphate	g/m^3	4.8	4.9	4.3	4.3	4.3	70
Biological oxygen demand	g O_2/m^3	< 2	< 2	< 2	< 2	< 2	2
Chemical oxygen demand	g O_2/m^3	< 6	< 6	< 6	< 6	< 6	14
Total organic carbon	g/m^3	1.8	< 0.5	< 0.5	< 0.5	< 0.5	8.2
Escherichia coli	MPN/100mL	< 1	< 1	< 1	< 1	< 1	1
Formaldehyde	g/m^3	-	-	< 0.02	-	< 0.02	< 0.02

2.1.3.3 Groundwater level monitoring

Groundwater level data was collected electronically at a 15-minute interval using in-situ level loggers. Data was downloaded quarterly. A comparison with rainfall data collected in the nearby Waiwhakaiho at Egmont Village rainfall site is included as Figure 3. An assessment of the data confirms all groundwater levels respond to sustained periods of rainfall recharge.

A summary of the range of groundwater levels at the site and the minimum required depth to water for each type of interment are included in Table 12 below. The Table indicates that groundwater level in area A apparently drops down since the de-watering project completed in this section in March 2023, while the other areas are not suitable for some types of burials due to the rise of groundwater level caused by heavy rainfall.

Table 12 2023/24 Groundwater level range and related burial type

Site code	Area	Shallow double burial Minimum depth of 1.8m BGL	Conventional single burial Minimum depth of burial is 1.2m BGL	Natural grave Minimum depth of burial is 1.0 mBGL	2023/2024Water level range (m BGL)		Range	High Water Level Commenced
		Minimum required depth to high water table (m BGL)			High	Low	(m)	
GND2627	north	2.6	2.0	1.8	2.367	4.311	1.944	6 Jul 2023
GND2624	north				0.477	4.775	4.298	24 Nov 2023
GND2625	east				0.803	4.054	3.251	20 Nov 2023
GND3032	south				2.767	5.162	2.395	20 Nov 2023
GND2484	south				3.029	4.690	1.661	21 Apr 2024
GND2623	west				2.907	4.919	2.012	20 Nov 2023

Groundwater level data for Area A and B, and the north border is illustrated in Figure 4, 5 and Figure 6. The minimum depth to water required for shallow double plot burials (red line), conventional single burials (green line) and natural burials (purple line) have been added for reference.

An assessment of the data indicates that groundwater levels fluctuated during this monitoring period significantly in GND2624 and GND2625, ranging from 0.477m BGL during the wetter months to 4.775m BGL in the drier months (Figure 4). GND2627, GND2484 and GND2624 didn't collect data from 06/11/2023-09/12/2024 due to sensor malfunction.

Groundwater levels in GND2623, GND2484 and GND3032 are subdued and fluctuate around a lower level this monitoring year (Figure 4 and Figure 5), which could be majorly attributed to the swale and subsoil drains constructed to intercept surface runoff from the hill at the north bound by discharging it to a natural wetland at the northeast side of the cemetery. Additionally, lighter precipitation (2117.5mm) in this compliance year could also be considered as a beneficial factor that leads to subdued bore water levels in these three bores. However, the high water level in GND2627 is still a couple of times slightly beyond 2.6m BGL which is the threshold set for double burials despite of the positive factors mentioned above. It may be a result of enhanced recharge, due to the close proximity of the forested hills.

While owing to the to the new sub-surface drains, higher groundwater levels for Area A and Area B (which occurred in previous years) have been apparently mitigated. Groundwater level data indicates that the north part of the Area A is still not suitable for shallow double plot stacked burials which require interment to a minimum depth of 1.8m BGL however, this section had been planned for cremation plot which is a shallow burial and releases less contaminants comparing to conventional plans. To ensure the long-term viability of

the cemetery for various categories of burials, a consistent monitoring programme for groundwater level would play a crucial role to assess the efficiency of the drainage pipes especially during heavy rainfalls.

To date the number of interments undertaken at the Cemetery has been significantly less than provided for in the burial report submitted prior to the cemetery opening. These numbers are expected to increase significantly once New Plymouth's other cemeteries close.

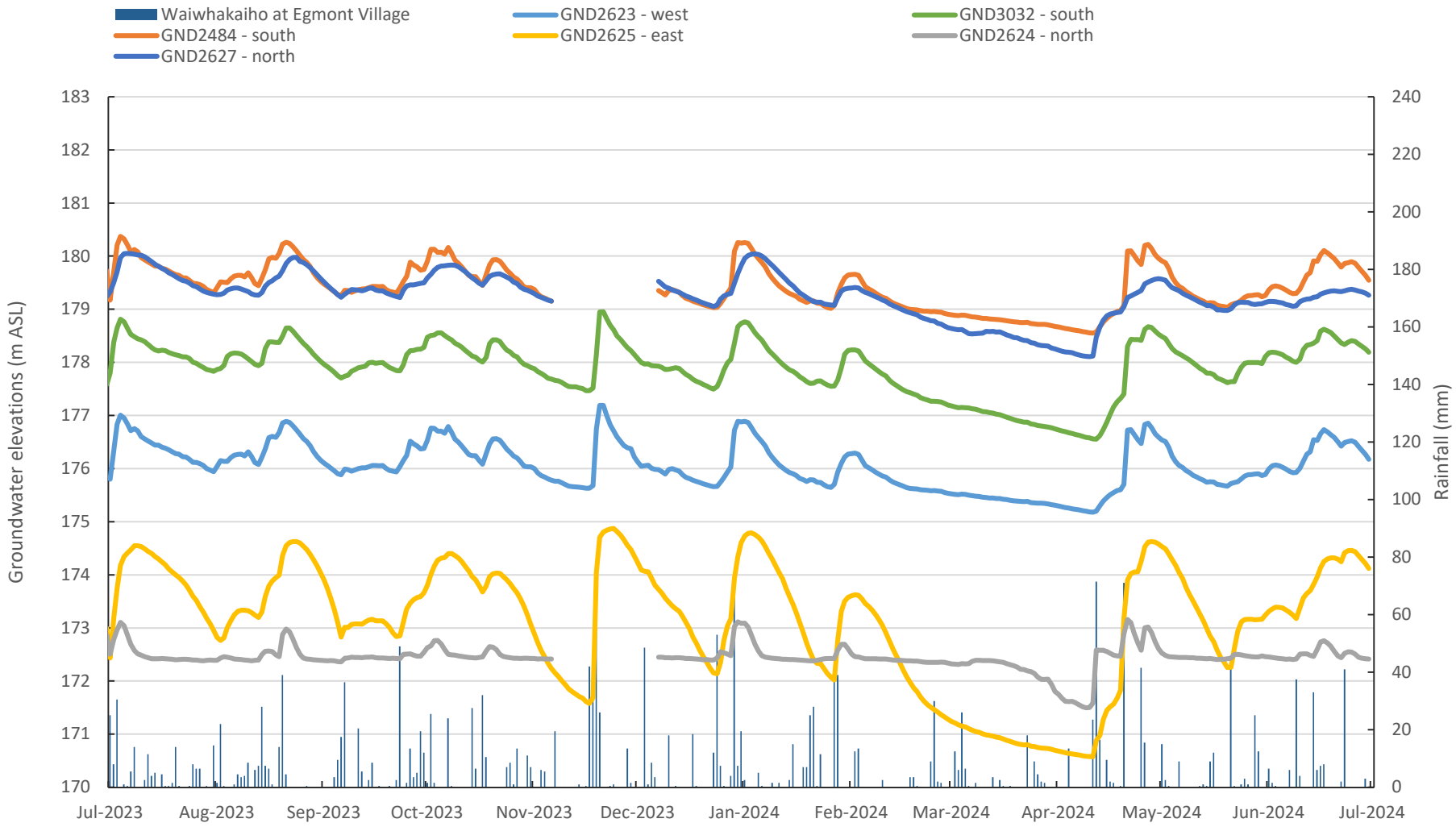

Figure 3 Groundwater elevations and rainfall at Egmont Village in 2023/24

**Note: GND2627, GND2484 and GND2624 didn't collect data from 06/11/2023-09/12/2024 due to sensor malfunction*

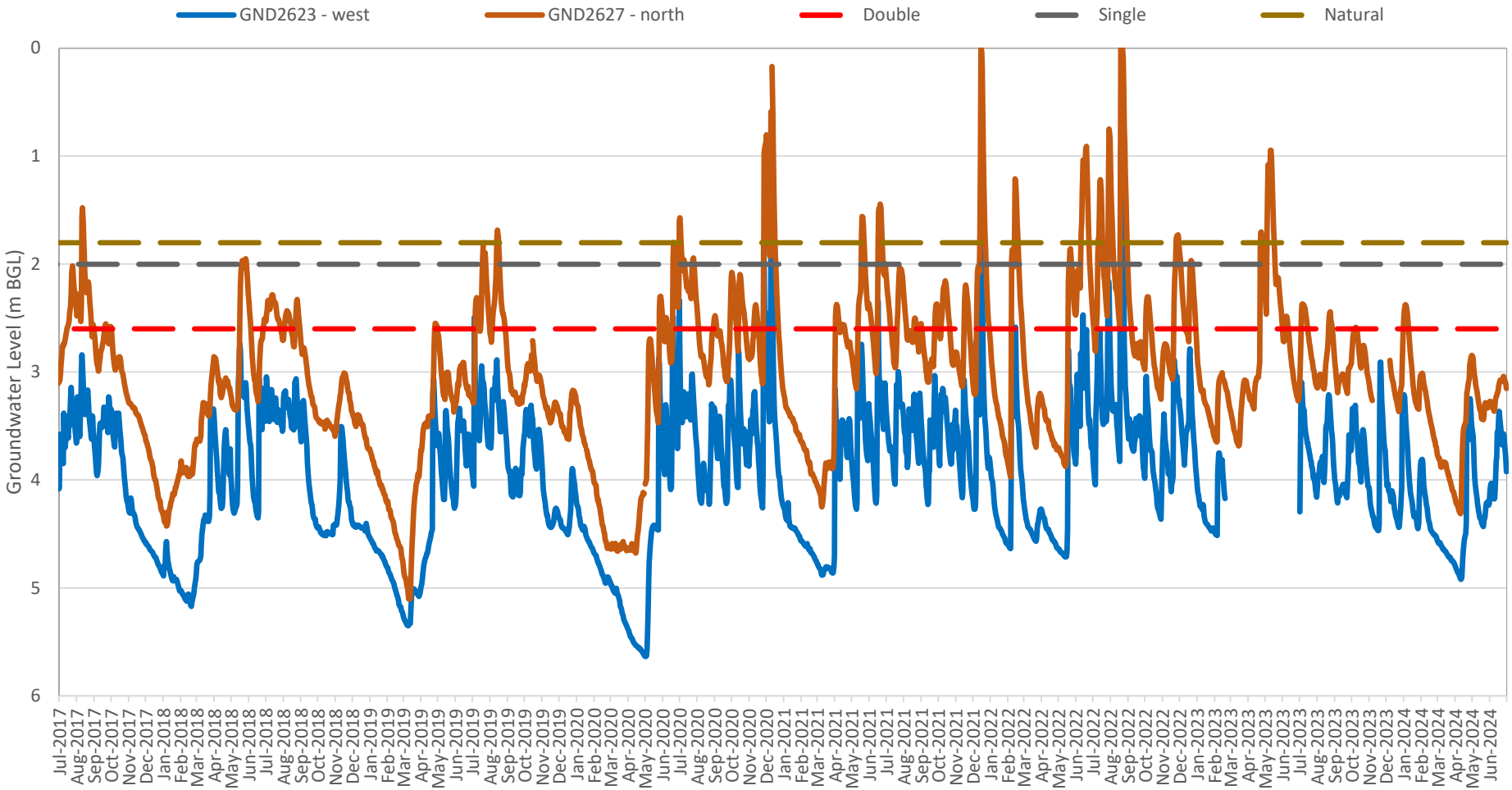

Figure 4 Groundwater levels Area A (GND2623 and GND2627) compared to minimum required water table depths by burial type

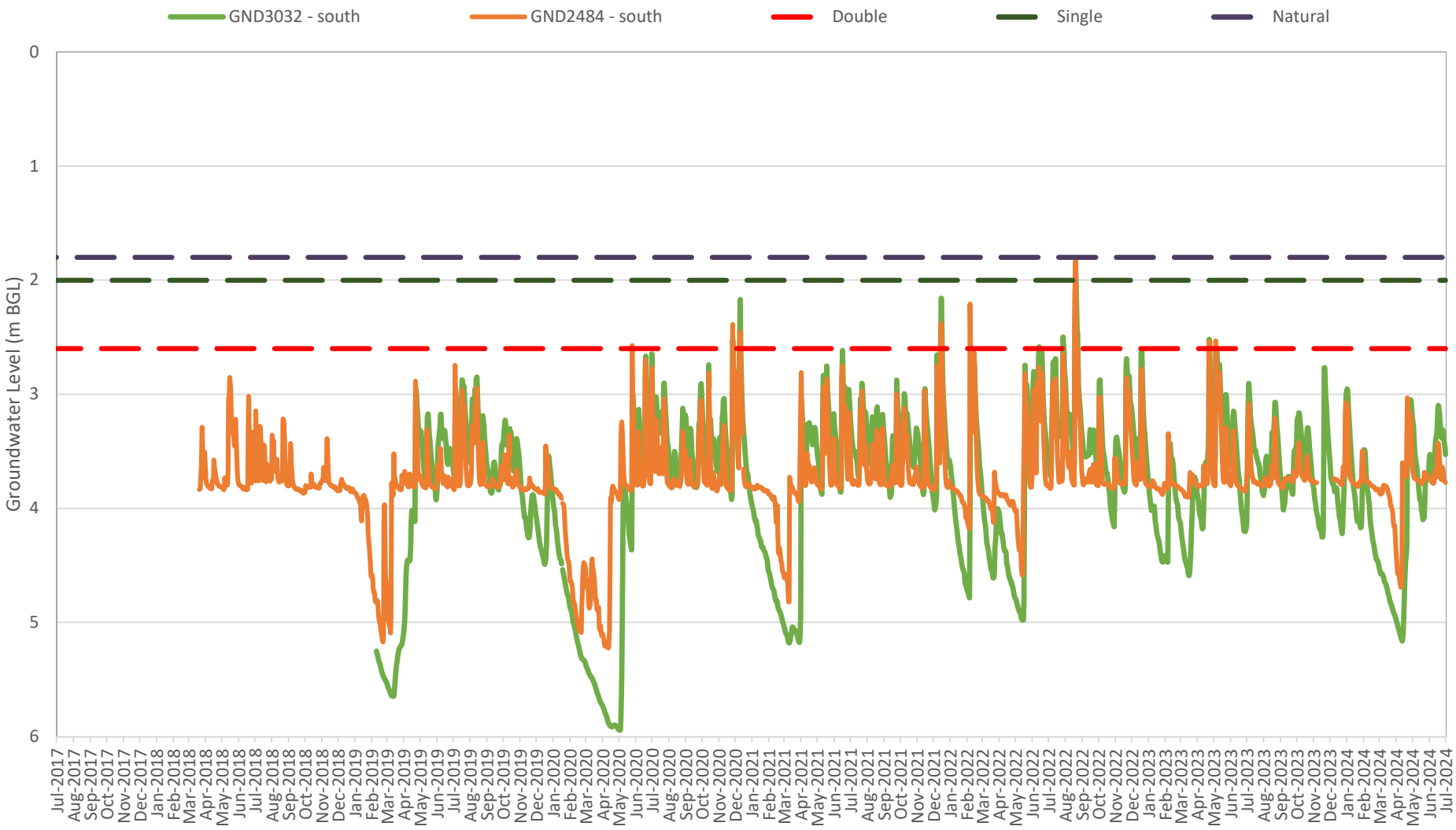

Figure 5 Groundwater levels Area-B (GND2484 and GND3032) compared to minimum required water table depths by burial type

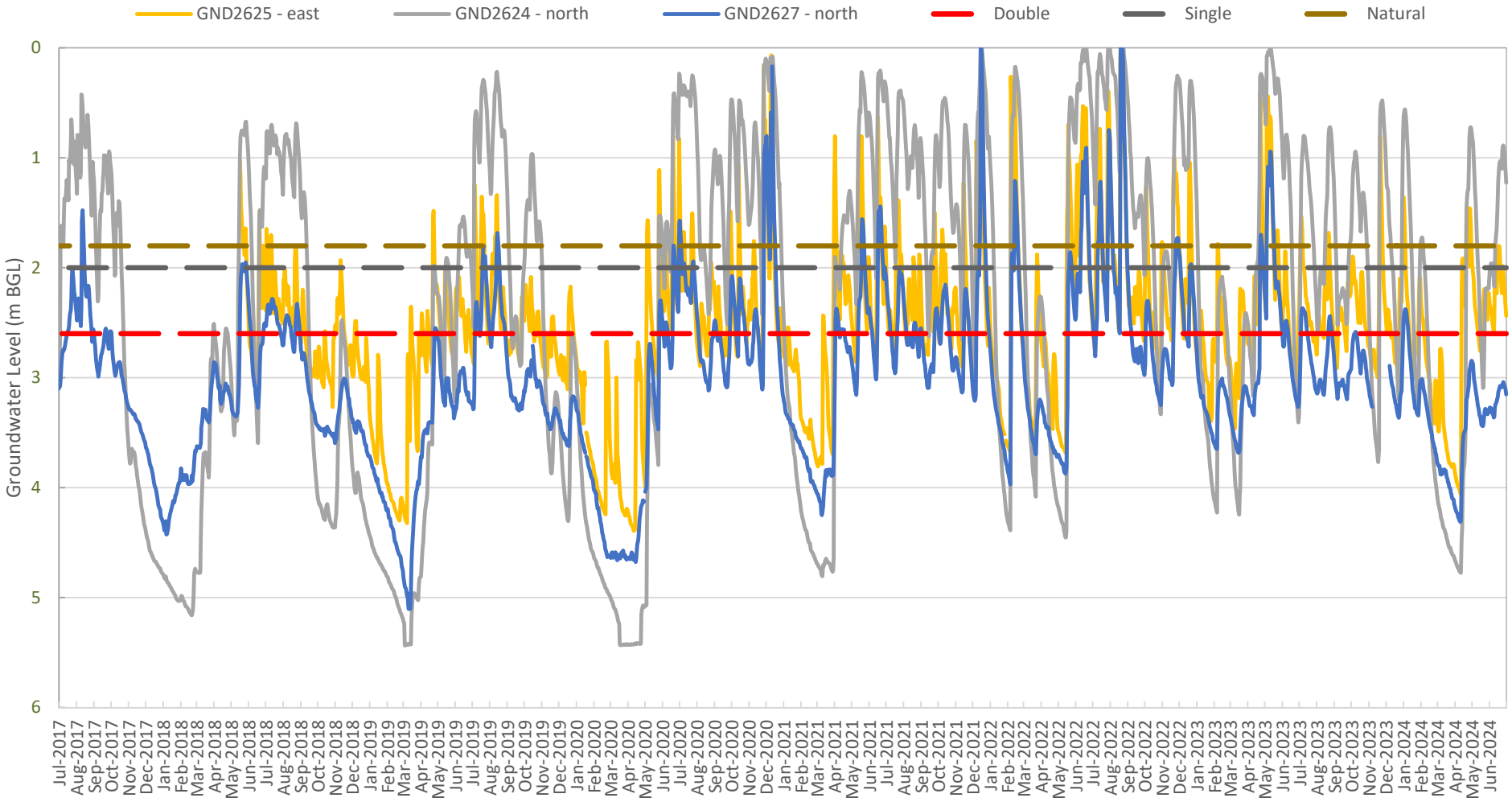

Figure 6 Groundwater levels in bores along the north boundary of the cemetery (GND2624, GND2625 and GND2627) compared to minimum required water table depths by burial type

2.2 Incidents, investigations, and interventions

The monitoring programme for the year was based on what was considered to be an appropriate level of monitoring, review of data, and liaison with NPDC and or their representatives. During the year matters may arise which require additional activity by the Council for example, provision of advice and information, or investigation of potential or actual causes of non-compliance or failure to maintain good practices. A pro-active approach, that in the first instance avoids issues occurring, is favoured.

The Council operates and maintains a register of all complaints or reported and discovered excursions from acceptable limits and practices, including non-compliance with consents, which may damage the environment. The incident register includes events where NPDC was concerned, and has notified Council themselves. The register contains details of any investigation and corrective action taken.

For all significant compliance issues, as well as complaints from the public, the Council maintains a database record. The record includes events where the individual/organisation concerned has itself notified the Council. Details of any investigation and corrective action taken are recorded for non-compliant events.

Complaints may be alleged to be associated with a particular site. If there is potentially an issue of legal liability, the Council must be able to prove by investigation that the identified individual/organisation is indeed the source of the incident (or that the allegation cannot be proven).

In the 2023/24 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with the Company's conditions in resource consents or provisions in Regional Plans.

3. Discussion

3.1 Discussion of site performance

The Cemetery opened to the public in May 2019 and the compliance monitoring programme commenced following the first interment in July 2019.

An annual inspection of the site on 12 September 2023 found it to be in good condition and being well managed. The monitoring programme was undertaken as required and data was provided to the Council for review in a timely manner.

During this monitoring period groundwater level data indicated that the cemetery is suitable for different interment plans (Figure 6) even in wetter months as a result of the de-watering network constructed in March 2023. Additionally, less significant precipitation also contributes to lowering the groundwater level of the site.

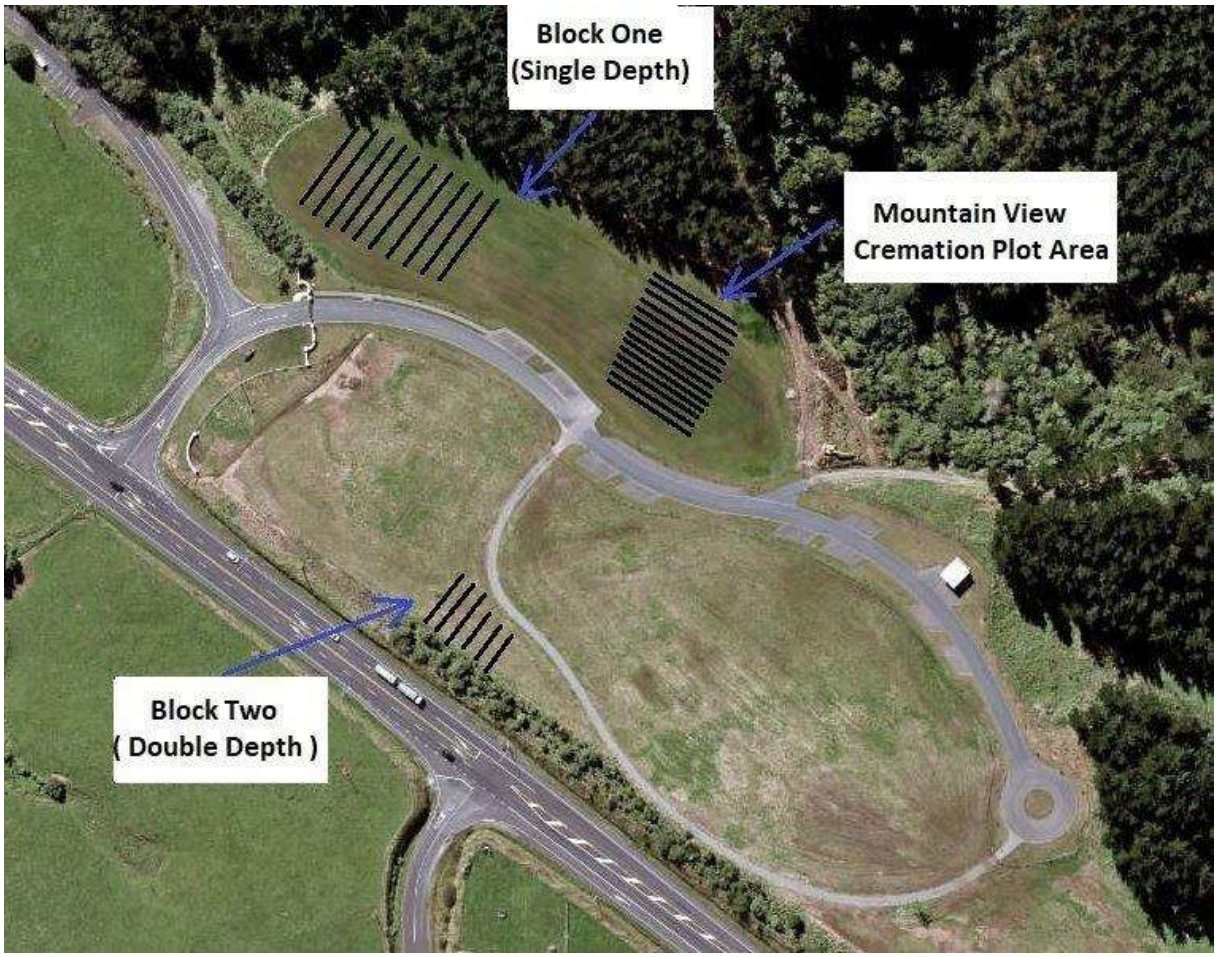

Figure 7 Type of interment planned for Area-A (Block One and Mountain View) and Area-B (Block Two)

The burial plan (Figure 2) contained a provision for up to 150 interments comprising of 75 in Area-A and 75 in Area-B during each year of the first five years of operation. The number of interments undertaken at the Cemetery have been significantly lower than shown in the burial plan over the last four years. The low interment numbers have been a result of the ongoing availability of the Awanui and Te Henui cemeteries which are located in Central New Plymouth. The availability of plots within the Awanui Cemetery is limited and the Te Henui Cemetery no longer has plots available for purchase and the number of interments at the new Cemetery is expected to rise significantly once the other two cemeteries close.

3.2 Environmental effects of exercise of consents

The groundwater and surface water monitoring components of this programme continued during the period under review, with 24 groundwater samples and 4 surface water samples collected from monitoring sites in the vicinity of the Cemetery. The results of the monitoring carried out show that the groundwater and surface water composition has remained relatively stable since monitoring commenced.

Groundwater and surface water monitoring included the sampling and analysis of a comprehensive suite of general water quality parameters and any contaminants related to the degradation of human remains. The monitoring programme also included the collection of groundwater level data from six bores. The data collected will allow for an in depth assessment of any variations in groundwater and surface water composition should the need arise in the future.

Surface water chemistry exhibited a distinct seasonal change. Groundwater composition in each bore remained relatively stable with only slight changes resulting from natural seasonal fluctuation and sampling variability. Groundwater composition differed slightly between bores due to depth and redox conditions.

An assessment of the groundwater level data concluded that no breach of consent conditions occurs and groundwater levels fluctuate in response to rainfall and are slightly higher in the northern and eastern areas of the site close to the forested hills. The range of levels differs between bores with the greatest range (4.298m) seen in GND2624.

There is no evidence to suggest that any activity undertaken at the Cemetery during the review period has had any adverse effect on local groundwater or surface water quality.

No complaints were received from the public with regard to the discharge consent during the period under review.

3.3 Evaluation of performance

A tabular summary of the consent holder's compliance record for the year under review is set out in Table 13. A summary of the consent holder's compliance record from 2018 is set out in Table 14.

Table 13 Summary of performance for consent 7882-1.1

Purpose: To discharge contaminants into land at a cemetery in circumstances where they may enter water		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Burials to occur within designated areas	Review burial plan	Yes
2. Burials must occur more than 50m from a surface water body	Review of burial plan	Yes
3. Best practicable option condition. Ensure graves remain > 0.8m above water table and spread burials in time and remain location	Updates to burial plan and review of water level data	Yes
4. Reporting provision	Receipt of report	Yes
5. Provision of a report detailing how compliance with Condition 3 will be achieved	Receipt of report	Yes
6. Notification requirement	Receipt of notification	Yes
7. Lapse condition	Commencement of activity prior to lapse date	N/A
8. Optional review provision re environmental effects	Option not available. Next review date June 2026	N/A
Overall assessment of environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**Good** **High**

N/A = not applicable

During the year, NPDC demonstrated a good level of environmental performance and a high level of administrative performance with the resource consents as defined in Appendix II.

Table 14 Evaluation of environmental performance over time

Year	Consent numbers	High	Good	Improvement req	Poor
2019-2020	7882-1.1	1	-	-	-
2020-2021	7882-1.1	-	1	-	-
2021-2022	7882-1.1	-	-	1	-
2022-2023	7882-1.1	1	1	-	-
2023-2024	7882-1.1	1	1	-	-

During the year, the Company demonstrated a good level of environmental and high level of administrative performance with the resource consents as defined in Appendix II.

3.4 Recommendations from the 2022/23 Annual Report

In the 2022/23 Annual Report, it was recommended:

1. THAT in the first instance, monitoring of consented activities in the 2023/24 year continues at the same level as in 2022/23.
2. THAT should there be any ongoing issues with environmental or administrative performance in 2023/24, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

3.5 Alterations to monitoring programmes for 2024/25

In designing and implementing the monitoring programmes for air/water discharges in the region, the Council has taken into account:

- the extent of information already made available through monitoring or other means to date;
- its relevance under the RMA;
- the Council's obligations to monitor consented activities and their effects under the RMA;
- the record of administrative and environmental performances of the consent holder; and
- reporting to the regional community.

The Council also takes into account the scope of assessments required at the time of renewal of permits, and the need to maintain a sound understanding of industrial processes within Taranaki exercising resource consents.

No planned changes have been made to the 2024/25 monitoring programme.

It should be noted that the proposed programme represents a reasonable and risk-based level of monitoring for the site(s) in question. The Council reserves the right to subsequently adjust the programme from that initially prepared, should the need arise if potential or actual non-compliance is determined at any time during 2024/25.

4. Recommendations

1. THAT in the first instance, monitoring of consented activities in the 2023/24 year continue at the same level as in 2023/24.
2. THAT should there be any ongoing issues with environmental or administrative performance in 2024/25, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

Glossary of common terms and abbreviations

The following abbreviations and terms may be used within this report:

Al*	Aluminium.
As*	Arsenic.
Biomonitoring	Assessing the health of the environment using aquatic organisms.
BOD	Biochemical oxygen demand. A measure of the presence of degradable organic matter, taking into account the biological conversion of ammonia to nitrate.
BODF	Biochemical oxygen demand of a filtered sample.
Bund	A wall around a tank to contain its contents in the case of a leak.
CBOD	Carbonaceous biochemical oxygen demand. A measure of the presence of degradable organic matter, excluding the biological conversion of ammonia to nitrate.
cfu	Colony forming units. A measure of the concentration of bacteria usually expressed as per 100 millilitre sample.
COD	Chemical oxygen demand. A measure of the oxygen required to oxidise all matter in a sample by chemical reaction.
Conductivity	Conductivity, an indication of the level of dissolved salts in a sample, usually measured at 25°C and expressed in µS/cm.
Cu*	Copper.
Cumec	A volumetric measure of flow- 1 cubic metre per second ($1m^3s^{-1}$).
DO	Dissolved oxygen.
DRP	Dissolved reactive phosphorus.
E.coli	Escherichia coli, an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre sample.
Ent	Enterococci, an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre of sample.
F	Fluoride.
FC	Faecal coliforms, an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre sample.
FNU	Formazin nephelometric units, a measure of the turbidity of water.
Fresh	Elevated flow in a stream, such as after heavy rainfall.
$g/m^2/day$	grams/metre^2/day.
g/m^3	Grams per cubic metre, and equivalent to milligrams per litre (mg/L). In water, this is also equivalent to parts per million (ppm), but the same does not apply to gaseous mixtures.
Incident	An event that is alleged or is found to have occurred that may have actual or potential environmental consequences or may involve non-compliance with a consent or rule in a regional plan. Registration of an incident by the Council does not automatically mean such an outcome had actually occurred.

Intervention	Action/s taken by Council to instruct or direct actions be taken to avoid or reduce the likelihood of an incident occurring.
Investigation	Action taken by Council to establish what were the circumstances/events surrounding an incident including any allegations of an incident.
Incident register	The incident register contains a list of events recorded by the Council on the basis that they may have the potential or actual environmental consequences that may represent a breach of a consent or provision in a Regional Plan.
L/s	Litres per second.
m^2	Square Metres.
MCI	Macroinvertebrate community index; a numerical indication of the state of biological life in a stream that takes into account the sensitivity of the taxa present to organic pollution in stony habitats.
Mixing zone	The zone below a discharge point where the discharge is not fully mixed with the receiving environment. For a stream, conventionally taken as a length equivalent to 7 times the width of the stream at the discharge point.
MPN	Most Probable Number. A method used to estimate the concentration of viable microorganisms in a sample.
µS/cm	Microsiemens per centimetre.
NH_4	Ammonium, normally expressed in terms of the mass of nitrogen (N).
NH_3	Unionised ammonia, normally expressed in terms of the mass of nitrogen (N).
NO_3	Nitrate, normally expressed in terms of the mass of nitrogen (N).
NTU	Nephelometric Turbidity Unit, a measure of the turbidity of water.
O&G	Oil and grease, defined as anything that will dissolve into a particular organic solvent (e.g. hexane). May include both animal material (fats) and mineral matter (hydrocarbons).
Pb*	Lead.
pH	A numerical system for measuring acidity in solutions, with 7 as neutral. Numbers lower than 7 are increasingly acidic and higher than 7 are increasingly alkaline. The scale is logarithmic i.e. a change of 1 represents a ten-fold change in strength. For example, a pH of 4 is ten times more acidic than a pH of 5.
Physicochemical	Measurement of both physical properties (e.g. temperature, clarity, density) and chemical determinants (e.g. metals and nutrients) to characterise the state of an environment.
PM_{10}, $PM_{2.5}$, $PM_{1.0}$	Relatively fine airborne particles (less than 10 or 2.5 or 1.0 micrometre diameter, respectively).
Resource consent	Refer Section 87 of the RMA. Resource consents include land use consents (refer Sections 9 and 13 of the RMA), coastal permits (Sections 12, 14 and 15), water permits (Section 14) and discharge permits (Section 15).
RMA	*Resource Management Act 1991* and including all subsequent amendments.
SS	Suspended solids.
SQMCI	Semi quantitative macroinvertebrate community index.
Temp	Temperature, measured in °C (degrees Celsius).
Turb	Turbidity, expressed in NTU or FNU.
Zn*	Zinc.

*an abbreviation for a metal or other analyte may be followed by the letters 'As', to denote the amount of metal recoverable in acidic conditions. This is taken as indicating the total amount of metal that might be solubilised under extreme environmental conditions. The abbreviation may alternatively be followed by the letter 'D', denoting the amount of the metal present in dissolved form rather than in particulate or solid form.

For further information on analytical methods, contact a manager within the Environment Quality Department.

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Appendix I

Resource consents held by
New Plymouth District Council

(For a copy of the signed resource consent
please contact the TRC Consents department)

Water abstraction permits

Section 14 of the RMA stipulates that no person may take, use, dam or divert any water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or it falls within some particular categories set out in Section 14. Permits authorising the abstraction of water are issued by the Council under Section 87(d) of the RMA.

Water discharge permits

Section 15(1)(a) of the RMA stipulates that no person may discharge any contaminant into water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or by national regulations. Permits authorising discharges to water are issued by the Council under Section 87(e) of the RMA.

Air discharge permits

Section 15(1)(c) of the RMA stipulates that no person may discharge any contaminant from any industrial or trade premises into air, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Permits authorising discharges to air are issued by the Council under Section 87(e) of the RMA.

Discharges of wastes to land

Sections 15(1)(b) and (d) of the RMA stipulate that no person may discharge any contaminant onto land if it may then enter water, or from any industrial or trade premises onto land under any circumstances, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Permits authorising the discharge of wastes to land are issued by the Council under Section 87(e) of the RMA.

Land use permits

Section 13(1)(a) of the RMA stipulates that no person may in relation to the bed of any lake or river use, erect, reconstruct, place, alter, extend, remove, or demolish any structure or part of any structure in, on, under, or over the bed, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Land use permits are issued by the Council under Section 87(a) of the RMA.

Coastal permits

Section 12(1)(b) of the RMA stipulates that no person may erect, reconstruct, place, alter, extend, remove, or demolish any structure that is fixed in, on, under, or over any foreshore or seabed, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Coastal permits are issued by the Council under Section 87(c) of the RMA.

Discharge Permit

Pursuant to the Resource Management Act 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of Consent Holder:	New Plymouth District Council Private Bag 2025 New Plymouth 4342
Decision Date (Change):	28 May 2018
Commencement Date (Change):	28 May 2018 (Granted Date: 9 November 2011)

Conditions of Consent

Consent Granted:	To discharge contaminants into land at a cemetery in circumstances where they may enter water
Expiry Date:	1 June 2046
Review Date(s):	June 2020, June 2026, June 2032, June 2038
Site Location:	279 Junction Road, New Plymouth
Grid Reference (NZTM)	1697558E-5667612N
Catchment:	Waiwhakaiho

For General, Standard and Special conditions
pertaining to this consent please see reverse side of this document

General condition

a. The consent holder shall pay to the Taranaki Regional Council all the administration, monitoring and supervision costs of this consent, fixed in accordance with section 36 of the Resource Management Act 1991.

Special conditions

1. This consent authorises the discharge of contaminants to land associated with the burial of deceased persons at a cemetery. Subject to the other conditions of this consent, burials shall occur only in the areas identified as 'potential burial areas' on the plan titled 'Location of burial areas' attached to this document.

2. No burial shall occur within 50 metres of any surface water body.

3. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or likely adverse effect on the environment associated with the discharge. The best practicable option includes, but is not limited to:

   a) ensuring graves are no deeper than 0.8 metres above the seasonally high watertable; and

   b) spreading the burials, in both time and location, to reduce point source loading of contaminants.

4. At least three months before the first burial, and at five-yearly intervals thereafter, the consent holder shall provide the Chief Executive, Taranaki Regional Council with a plan showing the specific areas where burials will occur.

5. The consent holder shall prepare a report that details how compliance with condition 3 will be achieved. The report shall be submitted for the approval of the Chief Executive, Taranaki Regional Council, acting in a certification capacity, at least three months before the first burial, and at five-yearly intervals thereafter.

6. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing of the date that the cemetery will become operative, at least 1 month before. Notification shall include the consent number and a brief description of the activity consented and shall be emailed to worknotification@trc.govt.nz.

7. This consent shall lapse on 31 December 2021, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

Appendix II

Categories used to evaluate environmental and administrative performance

Categories used to evaluate environmental and administrative performance

Environmental performance is concerned with actual or likely effects on the receiving environment from the activities during the monitoring year. Administrative performance is concerned with the Company's approach to demonstrating consent compliance in site operations and management including the timely provision of information to Council (such as contingency plans and water take data) in accordance with consent conditions.

Events that were beyond the control of the consent holder and unforeseeable (that is a defence under the provisions of the RMA can be established) may be excluded with regard to the performance rating applied. For example loss of data due to a flood destroying deployed field equipment.

The categories used by the Council for this monitoring period, and their interpretation, are as follows:

Environmental Performance

High: No or inconsequential (short-term duration, less than minor in severity) breaches of consent or regional plan parameters resulting from the activity; no adverse effects of significance noted or likely in the receiving environment. The Council did not record any verified unauthorised incidents involving environmental impacts and was not obliged to issue any abatement notices or infringement notices in relation to such impacts.

Good: Likely or actual adverse effects of activities on the receiving environment were negligible or minor at most. There were some such issues noted during monitoring, from self-reports, or during investigations of incidents reported to the Council by a third party but these items were not critical, and follow-up inspections showed they have been dealt with. These minor issues were resolved positively, co-operatively, and quickly. The Council was not obliged to issue any abatement notices or infringement notices in relation to the minor non-compliant effects however, abatement notices may have been issued to mitigate an identified potential for an environmental effect to occur.

For example:

- High suspended solid values recorded in discharge samples however, the discharge was to land or to receiving waters that were in high flow at the time;
- Strong odour beyond boundary but no residential properties or other recipient nearby.

Improvement required: Likely or actual adverse effects of activities on the receiving environment were more than minor, but not substantial. There were some issues noted during monitoring, from self-reports, or during investigations of incidents reported to the Council by a third party. Cumulative adverse effects of a persistent minor non-compliant activity could elevate a minor issue to this level. Abatement notices and infringement notices may have been issued in respect of effects.

Poor: Likely or actual adverse effects of activities on the receiving environment were significant. There were some items noted during monitoring, from self-reports, or during investigations of incidents reported to the Council by a third party. Cumulative adverse effects of a persistent moderate non-compliant activity could elevate an 'improvement required' issue to this level. Typically there were grounds for either a prosecution or an infringement notice in respect of effects.

Administrative performance

High: The administrative requirements of the resource consents were met, or any failure to do this had trivial consequences and were addressed promptly and co-operatively.

Good: Perhaps some administrative requirements of the resource consents were not met at a particular time however, this was addressed without repeated interventions from the Council staff. Alternatively adequate reason was provided for matters such as the no or late provision of information, interpretation of 'best practical option' for avoiding potential effects, etc.

Improvement required: Repeated interventions to meet the administrative requirements of the resource consents were made by Council staff. These matters took some time to resolve, or remained unresolved at the end of the period under review. The Council may have issued an abatement notice to attain compliance.

Poor: Material failings to meet the administrative requirements of the resource consents. Significant intervention by the Council was required. Typically there were grounds for an infringement notice.

Appendix III

Groundwater and surface water quality results

Parameter	Bore id	WKH000524 upstream												WKH000526 downstream											
Sample date	Unit	5-Oct-17	31-Jan-18	22-Jul-19	17-Jan-20	20-Jul-20	14-Jan-21	6-Jul-21	27-Jan-22	26-Jul-22	31-Jan-23	11-Jan-24	17-Jul-24	5-Oct-17	31-Jan-18	22-Jul-19	17-Jan-20	20-Jul-20	14-Jan-21	6-Jul-21	27-Jan-22	26-Jul-22	31-Jan-23	11-Jan-24	17-Jul-24
pH	pH	7.2	7.5	7.2	7.7	7	7.2	6.9	7.6	7.2	7.4	7.4	7.4	7.1	7.7	7.3	7.8	7.1	7.2	6.9	7.7	7.3	7.6	7.5	7.5
Total alkalinity	g/m^3 $CaCO_3$	36	76	33	62	36	45	37	60	29	53	49	44	36	73	32	59	36	45	37	60	28	53	48	43
Carbonate	g/m^3 CO_3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 1.0	< 1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 1.0	< 1.0
Bicarbonate	g/m^3 HCO_3	44	92	40	75	44	55	45	73	35	64	59	53	43	89	40	72	44	55	45	73	34	64	59	53
Total hardness	g/m^3 $CaCO_3$	43	74	40	63	43	49	43	60	33	52	52	50	43	73	40	62	43	49	44	62	31	55	53	50
Electrical conductivity	mS/m	14	21.5	13.4	18.1	13.8	15.7	13.9	17.8	11.3	17.2	15.9	15	14	21.1	13.3	18	13.8	15.4	13.8	18	11.1	16.5	16	14.9
Total suspended solids	g/m^3	<3	<3	<3	<3	<3	<3	<3	<3	19	<3	< 3	< 3	<3	<3	<3	5	<3	<3	<3	<3	12	<3	< 3	< 3
Total dissolved solids	g/m^3	95	146	90	126	103	100	96	128	86	108	107	95	108	153	93	123	90	89	75	133	97	118	90	99
Fluoride	g/m^3	<0.05	<0.05	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	-	-	-	-	-	-	-	-	-	-
Dissolved aluminium	g/m^3	0.009	0.028	-	-	-	-	-	-	-	-	-	-	0.006	0.005	-	-	-	-	-	-	-	-	-	-
Dissolved arsenic	g/m^3	<0.0010	<0.0010	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	-	-	-	-	-	-	-	-	-	-
Dissolved barium	g/m^3	0.028	0.024	-	-	-	-	-	-	-	-	-	-	0.027	0.021	-	-	-	-	-	-	-	-	-	-
Dissolved boron	g/m^3	0.013	0.009	-	-	-	-	-	-	-	-	-	-	0.012	0.01	-	-	-	-	-	-	-	-	-	-
Dissolved cadmium	g/m^3	<0.00005	<0.00005	-	-	-	-	-	-	-	-	-	-	<0.00005	<0.00005	-	-	-	-	-	-	-	-	-	-
Dissolved calcium	g/m^3	10.2	16	9.7	13.8	10.2	11.4	10.6	13.4	8.2	11.9	12.3	11.5	10.2	15.5	9.7	13.8	10.3	11.3	10.4	13.6	7.6	12.7	12.5	11.5
Dissolved chromium	g/m^3	<0.0005	<0.0005	-	-	-	-	-	-	-	-	-	-	0.0005	<0.0005	-	-	-	-	-	-	-	-	-	-
Dissolved copper	g/m^3	<0.0005	0.0007	-	-	-	-	-	-	-	-	-	-	<0.0005	0.0008	-	-	-	-	-	-	-	-	-	-
Dissolved iron	g/m^3	0.65	0.58	-	-	-	-	-	-	-	-	-	-	0.36	0.34	-	-	-	-	-	-	-	-	-	-
Dissolved lead	g/m^3	<0.00010	<0.00010	-	-	-	-	-	-	-	-	-	-	<0.00010	<0.00010	-	-	-	-	-	-	-	-	-	-
Dissolved magnesium	g/m^3	4.3	8.2	3.8	6.8	4.1	4.9	4.1	6.4	3	5.4	5.2	5.2	4.4	8.3	3.9	6.8	4.2	4.9	4.4	6.7	2.8	5.7	5.3	5.1
Dissolved manganese	g/m^3	0.13	0.141	-	-	-	-	-	-	-	-	-	-	0.096	0.048	-	-	-	-	-	-	-	-	-	-
Dissolved mercury	g/m^3	<0.00008	<0.00008	-	-	-	-	-	-	-	-	-	-	<0.00008	<0.00008	-	-	-	-	-	-	-	-	-	-
Dissolved Nickel	g/m^3	<0.0005	<0.0005	-	-	-	-	-	-	-	-	-	-	<0.0005	<0.0005	-	-	-	-	-	-	-	-	-	-
Dissolved potassium	g/m^3	2.9	3.5	2.8	3.4	2.7	2.9	2.6	2.8	3.2	2.9	2.6	2.6	2.9	3.7	2.7	3.6	2.7	3	2.6	2.8	3.1	2.9	2.7	2.6
Dissolved sodium	g/m^3	8.9	13.5	8.7	11.6	8.9	9.8	9.1	11.5	6.9	10.3	9.8	9.9	8.8	13.7	8.4	11.7	9.2	9.8	9.1	11.5	6.9	10.5	10	9.8
Dissolved zinc	g/m^3	0.0019	0.002	-	-	-			-					0.0015	<0.0010	-	-	-	-	-	-				
Chloride	g/m^3	12.7	14.5	12.4	14.6	12.6	12.5	12.5	13.3	9.8	11.6	12.3	12	12.7	14.6	12.4	14.4	12.6	11.7	12.5	13.5	9.6	12.2	12.3	12.1
Total nitrogen	g/m^3	1.58	0.79	1.7	1.18	1.7	1.28	1.66	1.17	1.88	1.24	1.6	1.42	1.47	0.75	1.64	1.14	1.64	1.22	1.61	1.17	1.88	1.16	1.45	1.37
Ammoniacal nitrogen	g/m^3	0.057	0.04	0.058	0.047	0.048	0.042	0.054	0.03	0.117	0.057	0.047	0.044	0.037	<0.010	0.041	<0.010	0.03	0.019	0.031	<0.010	0.194	0.017	0.016	0.017
Nitrite nitrogen	g/m^3 N	0.007	0.004	0.003	0.004	0.004	0.004	0.003	0.003	0.009	0.004	0.003	0.003	0.007	<0.002	0.004	0.003	0.004	0.004	0.004	0.002	0.009	0.004	0.004	0.003
Nitrate nitrogen	g/m^3 N	1.33	0.63	1.58	1.01	1.61	1.18	1.56	1.04	1.23	1.08	1.37	1.28	1.27	0.61	1.54	0.98	1.58	1.15	1.53	1.03	1.16	1.06	1.37	1.24
Nitrate & nitrite nitrogen	g/m^3 N	1.34	0.63	1.58	1.01	1.61	1.18	1.57	1.04	1.24	1.09	1.37	1.29	1.28	0.61	1.54	0.99	1.58	1.15	1.54	1.04	1.17	1.06	1.37	1.24
Total kjeldahl nitrogen	g/m^3	0.24	0.17	0.12	0.17	<0.10	<0.10	<0.10	0.13	0.64	0.15	0.23	0.13	0.19	0.14	<0.10	0.15	<0.10	<0.10	<0.10	0.14	0.7	<0.10	< 0.10	0.12
Dissolved reactive phosphorus	g/m^3	<0.004	0.005	<0.004	0.009	0.004	0.01	0.005	0.007	0.012	<0.004	< 0.004	< 0.004	<0.004	0.011	<0.004	0.01	0.005	0.01	0.005	0.01	0.013	0.008	< 0.004	< 0.004
Total phosphorus	g/m^3	0.016	0.029	0.023	0.026	0.018	0.023	0.014	0.019	0.103	0.018	0.01	0.011	0.013	0.022	0.018	0.041	0.012	0.019	0.01	0.018	0.094	0.016	0.009	0.011
Dissolved reactive silica	g/m^3 SiO_2	22	33	-	-	-	-	-	-	-	-	-	-	22	33	-	-	-	-	-	-				
Sulphate	g/m^3	5.9	7.2	5.5	6.3	6.5	5.8	6.1	6.3	4.6	5	5.8	5.5	6	6.8	5.5	6.2	6.5	5.4	6.3	6.4	4.5	5.3	6.4	5.6
Biological oxygen demand	g O_2/m^3	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	< 2	< 2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	< 2	< 2
Chemical oxygen demand	g O_2/m^3	<6	<6	<6	6	6	<6	<6	<6	15	<6	98	< 6	<6	<6	<6	6	8	6	<6	<6	13	<6	< 6	< 6
Total organic carbon	g/m^3	0.7	1.3	1.5	<0.5	1.5	1.8	0.8	2.1	6.4	1.6	0.8	1.4	0.8	<0.5	1.5	2.3	0.7	1.7	1.3	1.8	7.2	2.2	0.7	1.4
Escherichia coli	MPN / 100mL	> 200	579	261	225	308	613	110	980	2420	313	186	579	> 200	140	261	82	225	222	75	411	2420	225	96	345
Formaldehyde	g/m^3	<0.02	<0.02	-	-	-	-	-	-	-	-	-	-	<0.02	-	-	-	<0.02	-	-	-	-	-	-	-

Parameter	Sample date	Dissolved cadmium	Dissolved calcium	Dissolved chromium	Dissolved copper	Dissolved iron	Dissolved lead	Dissolved magnesium	Dissolved manganese	Dissolved mercury	Dissolved Nickel	Dissolved potassium	Dissolved sodium
Bore id	Unit	g/m^3	g/m^3	g/m^3	g/m^3	g/m^3	g/m^3	g/m^3	g/m^3	g/m^3	g/m^3	g/m^3	g/m^3
MW1 (GND2623)	27-Feb-17	<0.00005	8.0	<0.0005	<0.0005	<0.02	<0.00010	3.2	0.001	<0.00008	<0.0005	1.34	12.7
MW1 (GND2623)	26-May-17	<0.00005	7.7	<0.0005	<0.0005	<0.02	<0.00010	3.1	0.0012	<0.00008	<0.0005	1.53	14.9
MW1 (GND2623)	28-Aug-17	<0.00005	8.4	0.0005	0.001	<0.02	<0.00010	3.3	0.0014	<0.00008	<0.0005	1.53	12.8
MW1 (GND2623)	16-Nov-17	<0.00005	9.6	0.0005	0.0017	<0.02	<0.00010	3.7	0.0013	<0.00008	<0.0005	1.63	13.3
MW1 (GND2623)	22-Jul-19	-	10.5	-	-	-	-	3.6	-	-	-	1.73	11.6
MW1 (GND2623)	14-Oct-19	-	10.2	-	-	-	-	3.4	-	-	-	1.63	11.0
MW1 (GND2623)	17-Jan-20	<0.00005	10.7	<0.0005	0.0023	<0.02	0.00012	4.7	0.0011	<0.00008	<0.0005	1.61	14.9
MW1 (GND2623)	30-Apr-20	-	13.6	-	-	-	-	5.4	-	-	-	1.6	14.3
MW1 (GND2623)	20-Jul-20	-	9.7	-	-	-	-	3.2	-	-	-	1.71	10.3
MW1 (GND2623)	15-Oct-20	-	10.3	-	-	-	-	3.4	-	-	-	1.61	11.4
MW1 (GND2623)	14-Jan-21	<0.00005	10.4	<0.0005	0.0049	<0.02	<0.00010	3.8	0.0013	<0.00008	<0.0005	1.58	13.9
MW1 (GND2623)	8-Apr-21	-	9.6	-	-	-	-	3.4	-	-	-	1.65	12.9
MW1 (GND2623)	6-Jul-21	-	11.4	-	-	-	-	4.0	-	-	-	1.72	11.9
MW1 (GND2623)	28-Sep-21	-	9.9	-	-	-	-	3.1				1.54	9.1
MW1 (GND2623)	27-Jan-22	<0.00005	10.5	0.0005	0.0005	<0.02	0.00015	4.2	0.0014	<0.00008	<0.0005	1.61	13.9
MW1 (GND2623)	28-Apr-22	-	12.1	-	-	-	-	5.2	-	-	-	1.78	15.3
MW1 (GND2623)	26-Jul-22		10.3					3				1.52	8.4
MW1 (GND2623)	18-Oct-22	-	9.2	-	-	-	-	3.3	-	-	-	1.52	11.8
MW1 (GND2623)	31/01/2023	<0.00005	9.6	<0.0005	<0.0005	<0.02	<0.00010	4.2	0.0034	< 0.00008	<0.0005	1.54	14.1
MW1 (GND2623)	28-Apr-23	-	11.3	-	-	-	-	3.5	-	-	-	1.66	10
MW1 (GND2623)	19-Jul-23	-	9.9	-	-	-	-	3.8	-	-	-	1.5	10.9
MW1 (GND2623)	7-Nov-23	-	7.9	-	-	-	-	3.3	-	-	-	1.42	14.1
MW1 (GND2623)	11-Jan-24	< 0.00005	8.9	< 0.0005	0.0008	< 0.02	< 0.00010	3.6	0.0011	< 0.00008	< 0.0005	1.43	12.8
MW1 (GND2623)	9-Apr-24	-	11.8	-	-	-	-	5.1	-	-	-	1.7	14.2
MW2 (GND2624)	27-Feb-17	0.00011	17.8	<0.0005	0.0011	0.1	<0.00010	8.2	6.8	<0.00008	<0.0005	3.4	14.9
MW2 (GND2624)	26-May-17	0.0001	17.5	<0.0005	0.0015	2.8	<0.00010	7.9	9.4	<0.00008	<0.0005	4.1	15.4
MW2 (GND2624)	28-Aug-17	0.00012	17.5	<0.0005	0.002	1.69	<0.00010	8.6	10.6	<0.00008	<0.0005	4.9	14.2
MW2 (GND2624)	16-Nov-17	0.0001	16.9	<0.0005	0.0014	0.07	<0.00010	8.1	9.8	<0.00008	0.0006	3.8	13.7
MW2 (GND2624)	22-Jul-19	-	69.0	-	-	-	-	9.8	-	-	-	3.4	11.1
MW2 (GND2624)	14-Oct-19	-	35.0	-	-	-	-	11.2	-	-	-	3.7	14.3
MW2 (GND2624)	17-Jan-20	0.00016	22.0	<0.0005	0.0033	3	<0.00010	13.0	23	<0.00008	0.0007	4	16.7
MW2 (GND2624)	30-Apr-20	-	23.0	-	-	-	-	13.1	-	-	-	3.5	17.1
MW2 (GND2624)	20-Jul-20	-	62.0	-	-	-	-	10.7	-	-	-	4.4	15.2
MW2 (GND2624)	15-Oct-20	-	35.0	-	-	-	-	12.0	-	-	-	4.1	16.8
MW2 (GND2624)	14-Jan-21	0.00012	25.0	<0.0005	0.0053	11.9	<0.00010	14.1	25	<0.00008	0.0007	5.7	17.9
MW2 (GND2624)	8-Apr-21	-	21.0	-	-	-	-	13.9	-	-	-	4.5	16.3
MW2 (GND2624)	6-Jul-21	-	61.0	-	-	-	-	9.2	-	-	-	3.3	15.8
MW2 (GND2624)	28-Sep-21		25.0					12.6				4.1	15.1
MW2 (GND2624)	27-Jan-22	0.00012	24.0	<0.0005	0.0033	16.8	0.00066	13.8	24	<0.00008	0.0005	4.9	16.3
MW2 (GND2624)	28-Apr-22	-	24.0	-	-	-	-	14.7	-	-	-	4.9	17.3

Parameter	Sample date	Dissolved cadmium	Dissolved calcium	Dissolved chromium	Dissolved copper	Dissolved iron	Dissolved lead	Dissolved magnesium	Dissolved manganese	Dissolved mercury	Dissolved Nickel	Dissolved potassium	Dissolved sodium
MW2 (GND2624)	26-Jul-22	-	29	-	-	-	-	14.3	-	-	-	5.7	16.8
MW2 (GND2624)	18-Oct-22	-	20	-	-	-	-	16.5	-	-	-	5.3	16.5
MW2 (GND2624)	31-Jan-23	0.00012	22	<0.0005	0.0023	19.3	<0.00010	17.2	29	<0.00008	0.0007	5.3	16.6
MW2 (GND2624)	28-Apr-23	-	13.7	-	-	-	-	8	-	-	-	2.7	11.9
MW2 (GND2624)	19-Jul-23	-	22	-	-	-	-	14.1	-	-	-	3	15.1
MW2 (GND2624)	7-Nov-23	-	17.8	-	-	-	-	13.7	-	-	-	4.3	16.4
MW2 (GND2624)	11-Jan-24	< 0.00005	19.1	< 0.0005	0.0013	0.05	< 0.00010	11.3	1.71	< 0.00008	< 0.0005	3.2	14.1
MW2 (GND2624)	9-Apr-24	-	23	-	-	-	-	15.3	-	-	-	4.6	17.5
MW3 (GND2625)	27-Feb-17	0.00013	13.5	<0.0005	<0.0005	0.25	<0.00010	5.3	1.92	<0.00008	<0.0005	4.1	11.0
MW3 (GND2625)	26-May-17	<0.00005	14.9	<0.0005	<0.0005	0.79	<0.00010	5.7	2.4	<0.00008	<0.0005	4.6	11.7
MW3 (GND2625)	28-Aug-17	<0.00005	17.7	<0.0005	<0.0005	1.66	<0.00010	7.3	2.6	<0.00008	<0.0005	4.4	10.4
MW3 (GND2625)	16-Nov-17	<0.00005	15.8	<0.0005	<0.0005	1.56	<0.00010	6.8	4.1	<0.00008	0.0006	4.2	10.3
MW3 (GND2625)	22-Jul-19	-	19.1	-	-	-	-	6.5	-	-	-	3.7	8.3
MW3 (GND2625)	14-Oct-19	-	19.6	-	-	-	-	9.4	-	-	-	4.7	10.4
MW3 (GND2625)	17-Jan-20	0.00012	19.0	<0.0005	0.0008	6	<0.00010	9.7	18.9	<0.00008	0.0007	4.6	11.2
MW3 (GND2625)	30-Apr-20	-	19.4	-	-	-	-	10.0	-	-	-	5.1	11.9
MW3 (GND2625)	20-Jul-20	-	21.0	-	-	-	-	10.1	-	-	-	5.7	10.9
MW3 (GND2625)	15-Oct-20	-	19.8	-	-	-	-	9.3	-	-	-	5.5	10.7
MW3 (GND2625)	14-Jan-21	<0.00005	18.9	<0.0005	0.00009	14.6	<0.00010	9.9	22	<0.00008	<0.0005	6.1	10.4
MW3 (GND2625)	8-Apr-21	-	17.9	-	-	-	-	9.3	-	-	-	6.3	9.9
MW3 (GND2625)	6-Jul-21	-	19.8	-	-	-	-	9.0	-	-	-	5.7	9.0
MW3 (GND2625)	28-Sep-21		5.3					4.3				0.55	11.2
MW3 (GND2625)	27-Jan-22	<0.00005	-	<0.0005	<0.0005	18	<0.00010	-	18.7	<0.00008	0.0006	-	-
MW3 (GND2625)	28-Apr-22	-	20.0	-	-	-	-	10.5	-	-	-	6.7	10.7
MW3 (GND2625)	26-Jul-22	-	19	-	-	-	-	8.8	-	-	-	6.1	9
MW3 (GND2625)	18-Oct-22	-	15.9	-	-	-	-	7.5	-	-	-	5.3	7.7
MW3 (GND2625)	31-Jan-23	<0.00005	18.9	<0.0005	0.001	27	<0.00010	8.2	18.2	<0.00008	0.0007	5.1	16.6
MW3 (GND2625)	28-Apr-23	-	17.9	-	-	-	-	9.3	-	-	-	6.3	9.9
MW3 (GND2625)	19-Jul-23	-	7.6	-	-	-	-	6.9	-	-	-	0.69	13.4
MW3 (GND2625)	7-Nov-23	-	6.6	-	-	-	-	5.4	-	-	-	0.75	14.9
MW3 (GND2625)	11-Jan-24	< 0.00005	5.5	0.0008	< 0.0005	35	< 0.00010	5.3	0.0006	< 0.00008	< 0.0005	0.6	12.5
MW3 (GND2625)	9-Apr-24	-	7.4	-	-	-	-	5.2	-	-	-	0.86	16
MW4 (GND2626)	27-Feb-17	<0.00005	6.3	0.0005	<0.0005	<0.02	<0.00010	2.7	0.0012	<0.00008	<0.0005	1.13	9.2
MW4 (GND2626)	26-May-17	<0.00005	6.3	<0.0005	<0.0005	<0.02	<0.00010	2.7	0.0015	<0.00008	<0.0005	1.25	9.3
MW4 (GND2626)	28-Aug-17	<0.00005	6.3	0.0006	<0.0005	<0.02	<0.00010	2.8	0.0022	<0.00008	<0.0005	1.18	8.9
MW4 (GND2626)	16-Nov-17	<0.00005	6.7	0.0005	<0.0005	<0.02	<0.00010	2.8	0.0021	<0.00008	<0.0005	1.22	8.7
MW4 (GND2626)	22-Jul-19	-	5.5	-	-	-	-	2.4	-	-	-	1.18	7.9
MW4 (GND2626)	14-Oct-19	-	5.8	-	-	-	-	2.5	-	-	-	1.07	8.0
MW4 (GND2626)	17-Jan-20	<0.00005	7.0	<0.0005	0.0058	<0.02	<0.00010	3.4	0.0071	<0.00008	<0.0005	1.19	9.9
MW4 (GND2626)	30-Apr-20	-	7.5	-	-	-	-	3.7	-	-	-	1.29	10.3
MW4 (GND2626)	20-Jul-20	-	6.1	-	-	-	-	2.7	-	-	-	1.18	8.7
MW4 (GND2626)	15-Oct-20	-	4.7	-	-	-	-	2.0	-	-	-	1.02	6.9

Parameter	Sample date	Dissolved cadmium	Dissolved calcium	Dissolved chromium	Dissolved copper	Dissolved iron	Dissolved lead	Dissolved magnesium	Dissolved manganese	Dissolved mercury	Dissolved Nickel	Dissolved potassium	Dissolved sodium
MW4 (GND2626)	14-Jan-21	<0.00005	6.5	0.0007	0.0015	<0.02	<0.00010	2.8	0.0051	<0.00008	<0.0005	1.16	8.7
MW4 (GND2626)	8-Apr-21	-	6.5	-	-	-	-	3.1	-	-	-	1.28	9.6
MW4 (GND2626)	6-Jul-21	-	6.3	-	-	-	-	2.8	-	-	-	1.18	9.0
MW4 (GND2626)	28-Sep-21		20.0					6.9				4.4	7.1
MW4 (GND2626)	27-Jan-22	<0.00005	6.6	0.0008	<0.0005	<0.02	<0.00010	3.0	0.0098	<0.00008	<0.0005	1.17	9.2
MW4 (GND2626)	28-Apr-22	-	7.3	-	-	-	-	3.4	-	-	-	1.29	10.2
MW4 (GND2626)	26-Jul-22	-	6	-	-	-	-	2.6	-	-	-	1.14	8.6
MW4 (GND2626)	18-Oct-22	-	5.9	-	-	-	-	2.7	-	-	-	1.08	8.3
MW4 (GND2626)	31-Jan-23	<0.00005	6.1	0.0005	0.0005	<0.02	<0.00010	3.1	0.0039	<0.00008	<0.0005	1.16	9.4
MW4 (GND2626)	28-Apr-23	-	5.9	-	-	-	-	2.6	-	-	-	1.16	9
MW4 (GND2626)	19-Jul-23	-	21	-	-	-	-	6.6	-	-	-	4	6.7
MW4 (GND2626)	7-Nov-23	-	21	-	-	-	-	7.2	-	-	-	4.6	8
MW4 (GND2626)	11-Jan-24	< 0.00005	22	< 0.0005	0.0014	<0.02	< 0.00010	9	20	< 0.00008	0.0005	5	9.5
MW4 (GND2626)	9-Apr-24	-	19.9	-	-	-	-	9.4	-	-	-	5.2	10.1
MW5 (GND2627)	27-Feb-17	<0.00005	6.6	0.0006	<0.0005	<0.02	<0.00010	5.0	0.0015	<0.00008	<0.0005	0.76	14.2
MW5 (GND2627)	26-May-17	<0.00005	5.5	<0.0005	0.0012	<0.02	0.00044	4.3	0.0019	<0.00008	<0.0005	0.67	12.9
MW5 (GND2627)	28-Aug-17	<0.00005	5.7	0.0008	0.0005	0.04	<0.00010	4.9	0.0035	<0.00008	<0.0005	0.66	12.7
MW5 (GND2627)	16-Nov-17	<0.00005	6.3	0.0007	<0.0005	<0.02	<0.00010	4.9	0.001	<0.00008	<0.0005	0.84	13.4
MW5 (GND2627)	22-Jul-19	-	4.9	-	-	-	-	3.2	-	-	-	0.61	10.8
MW5 (GND2627)	14-Oct-19	-	5.1	-	-	-	-	4.1	-	-	-	0.59	11.2
MW5 (GND2627)	17-Jan-20	<0.00005	5.9	0.0007	0.0007	<0.02	<0.00010	4.7	0.006	<0.00008	<0.0005	0.72	13.4
MW5 (GND2627)	30-Apr-20	-	6.7	-	-	-	-	5.1	-	-	-	0.83	15.1
MW5 (GND2627)	20-Jul-20	-	4.6	-	-	-	-	3.6	-	-	-	0.49	10.8
MW5 (GND2627)	15-Oct-20	-	4.6	-	-	-	-	3.4	-	-	-	0.54	11.4
MW5 (GND2627)	14-Jan-21	<0.00005	5.3	0.0006	0.0012	<0.02	<0.00010	4.0	0.0008	<0.00008	<0.0005	0.63	11.4
MW5 (GND2627)	8-Apr-21	-	5.4	-	-	-	-	4.6	-	-	-	0.62	12.2
MW5 (GND2627)	6-Jul-21	-	6.2	-	-	-	-	5.1	-	-	-	0.61	13.0
MW5 (GND2627)	28-Sep-21		5.6					2.4				1.07	7.7
MW5 (GND2627)	27-Jan-22	<0.00005	5.6	0.001	0.0007	<0.02	<0.00010	4.2	0.0026	<0.00008	<0.0005	0.67	12.6
MW5 (GND2627)	28-Apr-22	-	5.8	-	-	-	-	4.7	-	-	-	0.7	13.8
MW5 (GND2627)	26-Jul-22	-	7.3	-	-	-	-	6	-	-	-	0.65	14.2
MW5 (GND2627)	18-Oct-22	-	6.8	-	-	-	-	6	-	-	-	0.69	13.6
MW5 (GND2627)	31-Jan-23	<0.00005	6.5	0.0007	<0.0005	<0.02	<0.00010	5.5	0.0008	<0.00008	<0.0005	0.72	14.2
MW5 (GND2627)	28-Apr-23	-	5.5	-	-	-	-	3.7	-	-	-	0.53	12.3
MW5 (GND2627)	19-Jul-23	-	5.9	-	-	-	-	2.7	-	-	-	1.07	8.4
MW5 (GND2627)	7-Nov-23	-	6	-	-	-	-	2.8	-	-	-	1.11	9
MW5 (GND2627)	11-Jan-24	< 0.00005	6	0.0006	< 0.0005	< 0.02	< 0.00010	2.9	0.0032	< 0.00008	< 0.0005	1.08	9.3
MW5 (GND2627)	9-Apr-24	-	6.8	-	-	-	-	3.1	-	-	-	1.18	9.7
MW6 (GND3032)	31-Jan-19	<0.00005	31.0	0.0022	0.0007	<0.02	<0.00010	7.7	0.085	<0.00008	0.0014	1.83	21.0
MW6 (GND3032)	22-Jul-19	-	28.0	-	-	-	-	7.9	-	-	-	1.66	15.4
MW6 (GND3032)	14-Oct-19	-	22.0	-	-	-	-	6.6	-	-	-	1.61	13.2
MW6 (GND3032)	17-Jan-20	<0.00005	16.7	0.0009	0.0014	<0.02	<0.00010	6.1	0.0024	<0.00008	0.0006	1.6	13.2

Parameter	Sample date	Dissolved cadmium	Dissolved calcium	Dissolved chromium	Dissolved copper	Dissolved iron	Dissolved lead	Dissolved magnesium	Dissolved manganese	Dissolved mercury	Dissolved Nickel	Dissolved potassium	Dissolved sodium
MW6 (GND3032)	**30-Apr-20**	-	25.0	-	-	-	-	8.1	-	-	-	1.52	15.1
MW6 (GND3032)	**20-Jul-20**	-	19.3	-	-	-	-	6.7	-	-	-	1.51	14.0
MW6 (GND3032)	**15-Oct-20**	-	18.6	-	-	-	-	6.4	-	-	-	1.48	15.7
MW6 (GND3032)	**14-Jan-21**	<0.00005	15.2	0.0005	0.0022	<0.02	<0.00010	5.6	0.0148	<0.00008	<0.0005	1.57	12.2
MW6 (GND3032)	**6-Jul-21**	-	14.9	-	-	-	-	5.5	-	-	-	1.55	13.0
MW6 (GND3032)	**6-Jul-21**	-	14.9	-	-	-	-	5.5	-	-	-	1.55	13.0
MW6 (GND3032)	**28-Sep-21**		14.6					5.5				1.46	13.3
MW6 (GND3032)	**27-Jan-22**	<0.00005	12.9	0.0008	0.0018	<0.02	<0.00010	5.0	0.0102	<0.00008	<0.0005	1.59	11.8
MW6 (GND3032)	**28-Apr-22**	-	13.9	-	-	-	-	5.6	-	-	-	1.75	12.5
MW6 (GND3032)	**26-Jul-22**	-	12.5	-	-	-	-	4.7	-	-	-	1.4	13.2
MW6 (GND3032)	**18-Oct-22**	-	12.2	-	-	-	-	5	-	-	-	1.47	11.4
MW6 (GND3032)	**31-Jan-23**	<0.00005	12.6	0.0006	0.0014	<0.02	<0.00010	5.7	0.0058	<0.00008	<0.0005	1.52	12.2
MW6 (GND3032)	**28-Apr-23**	-	12.3	-	-	-	-	4.8	-	-	-	1.41	14.5
MW6 (GND3032)	**19-Jul-23**	-	12.6	-	-	-	-	5.1	-	-	-	1.41	12.1
MW6 (GND3032)	**7-Nov-23**	-	11.1	-	-	-	-	4.6	-	-	-	1.42	11.2
MW6 (GND3032)	**11-Jan-24**	< 0.00005	11.4	0.0008	< 0.0005	< 0.02	< 0.00010	4.9	0.0038	< 0.00008	< 0.0005	1.45	11.7
MW6 (GND3032)	**9-Apr-24**	-	12.5	-	-	-	-	5.2	-	-	-	1.59	12.8