Waste Remediation Services (WRS) Ltd

Symes Manawapou Landfarm
Monitoring Programme
Annual Report
2023/24
Technical Report 2024-22

Taranaki
Regional Council

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Taranaki Regional Council
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Executive summary

Waste Remediation Services Ltd (the Company) operates WRS Symes Manawapou Landfarm, located at 156 Manawapou Road, Manutahi, in the Manawapou catchment, South Taranaki. The consent was granted in 2012 and was then transferred to the Company in June 2014.

This report for the period July 2023 to June 2024 describes the monitoring programme implemented by Taranaki Regional Council (the Council) to assess the Company'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, the Company demonstrated an overall high level of environmental performance and an overall high level of administrative performance.

The Company holds one resource consent, which includes a total of 31 conditions setting out the requirements that the Company must satisfy. The Company holds one consent to allow it to discharge drilling waste and water treatment sludge to land under the practice known as landfarming.

The Council's monitoring programme for the year under review included two routine inspections six routine groundwater samples, one surface water sample and seven composite soil samples collected for physicochemical analysis.

Landfarming continued in the spreading area Stage II/Phase 3. Due to the suspension of drilling by Todd Energy late 2023, this site has had an overall reduced activity during 2023/24.

Inspections found the site to be compliant on all occasions. Previously landfarmed areas held good pasture cover.

During the monitoring year the groundwater samples demonstrated overall stability for the analytes tested. However, in the latter part of the monitoring year there was a marginal rise in analytes in one of the bores, whilst concentration levels remained relatively stable in the other bore. The third bore remained dry for the entire monitoring period, which could potentially be attributed to the relatively low rainfall in the area during the past year.

Lake Taumaha sample analysis demonstrates that the surface water quality continues to remain stable and unaffected by the landfarming activities.

Soil sample analysis found that further bioremediation would be required prior to surrender of the areas sampled.

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.

In terms of overall environmental and compliance performance by the consent holder over the last several years, this report shows that the consent holder's remains at a high 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 a resource consent held by Waste Remediation Services Ltd (WRS) (the Company). The Company operates a landfarm, WRS Symes Manawapou Landfarm situated at 156 Manawapou Road, Manutahi, in the Manawapou catchment.

The report includes the results and findings of the monitoring programme implemented by the Council in respect of the consent held by the Company to discharge drilling waste to land.

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 in the Manawapou 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 and administrative 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 III.

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

1.2.1 Drilling waste

Waste drilling material is produced during well drilling for hydrocarbon exploration. The primary components of this waste are drilling fluids (muds) and rock cuttings. Drilling fluids are engineered to perform several crucial tasks in the drilling of a hydrocarbon well. These include: transporting cuttings from the drill bit to the well surface for disposal; controlling hydrostatic pressure in the well; supporting the sides of the hole and preventing the ingress of formation fluids; and lubricating and cooling the drill bit and drill pipe in the hole.

Drilling fluids

Oil and gas wells may be drilled with either synthetic-based mud (SBM) or water-based mud (WBM). As the names suggest, these are fluids with either water (fresh or saline) or synthetic oil as a base material, to which further compounds are added to modify the physical characteristics of the mud (for example mud weight or viscosity). More than one type of fluid may be used to drill an individual well. In the past, oil-based muds (diesel/crude oil based) have also been used. Their use has declined since the 1980s due to their ecotoxicity; they have been replaced by SBM. SBM use olefins, paraffin or esters as a base material. While this is technically still a form of oil based fluid, these fluids have been engineered to remove polycyclic aromatic hydrocarbons, reduce the potential for bioaccumulation, and accelerate biodegradation compared with OBM.

Common constituents of WBM and SBM include weighting agents, viscosifiers, thinners, lost circulation materials (LCM), pH control additives, dispersants, corrosion inhibitors, bactericides, filtrate reducers, flocculants and lubricants. Of these, the naturally occurring clay mineral barite (barium sulphate) is generally the most common additive. It is added to most drilling muds as a wetting and weighting agent.

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[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

Drilling fluids may be intentionally discharged in bulk for changes to the drilling fluid programme or at the completion of drilling. Depending on operational requirements and fluid type and properties, fluids may be re-used in multiple wells.

Cuttings

Cuttings are produced as the drill bit penetrates the underlying geological formations. They are brought to the surface in the drilling fluid where they pass over a shaker screen that separates the cuttings and drilling fluids. The drilling fluids are recycled for reuse within the drilling process, but small quantities of drilling fluids remain adhered to the cuttings. The cuttings and smaller particle material from the drill fluid treatment units drain into sumps. If sumps cannot be constructed, corrals or special bins are used. During drilling this material is the only continuous discharge.

1.2.2 Landfarming

The landfarming process has typically been used in the Taranaki region to assist the conversion of sandy coastal sites prone to erosion into productive pasture. Results of an independent research project conducted by AgKnowledge Ltd (2013) have indicated that the re-contoured sand dunes, after the inclusion of the drilling wastes (as per the consents), and with the addition of appropriate fertilisers and water (irrigation) are capable of producing high quality clover-based pastures and thus increasing the value of the land from about $3-4,000/ha to $30-40,000/ha (2013).

Landfarming uses natural and assisted bioremediation to reduce the concentration of petroleum compounds through degradation. The basic steps in the landfarming process are:

Drilling waste is transported from wellsites by truck (cuttings) or tanker (liquids). It may be discharged directly to land or placed in a dedicated storage pit.

The required area is prepared by scraping back and stockpiling existing pasture/topsoil and levelling out uneven ground.

Waste is transferred to the prepared area by excavator and truck and spread out with a bulldozer. Liquids may be discharged by tanker or a spray system.

Waste is allowed to dry sufficiently before being tilled into the soil to the required depth with a tractor and discs.

The disposal area is levelled with chains or harrows.

Stockpiled or brought in topsoil/clay is applied to aid stability and assist in grass establishment.

Fertiliser may be applied and the area is sown in crop or pasture at a suitable time of year.

Photos 1 to 3 depict different stages in the landfarming process at the Manawapou Landfarm. The landfarming process utilised at the site is on a single application basis. This means dedicated spreading areas each receive only a single application of waste. When disposal is complete, the area will be reinstated and monitored until consent surrender criteria have been met.

Photo 1 WRS Symes Manawapou Landfarm post discharge and reinstatement pre-seeding 2014

Photo 2 WRS Symes Manawapou Landfarm post surrender sampling 2018

1.3 Site location and description

The site is located on Manawapou Road, Manutahi in South Taranaki. This site is positioned on marginal coastal farm land situated on reworked dune fields. An extensive (100-250m) foredune is located seaward of the consented site, and will remain undisturbed by site activities. The foredune provides a considerable natural buffer from prevailing onshore winds. A natural gas pipeline runs adjacent to the length of the site on the seaward side, marking the seaward extent of the disposal site. In addition, a QE II covenant is located in the north western end of the site, and Lake Taumaha (which is a QE II covenant and a Key Native Ecosystem) is located east of the site. The proximity of the site to these recognised ecosystems has been taken into account in the setting of buffer distances and location of the stockpiling facilities.

The predominant soil type has been identified as black loamy sand and vegetation growth is primarily a mixture of pasture and dune grasses. Test pitting and the logging of boreholes on site indicated a relatively shallow water table. Test bores were augured to 10m in the pit area, revealing extensive compacted, low permeable clays underlying coastal dune sands. Pit construction revealed mostly tightly packed sand at the pit bases (approximately 4-5m below surface). Average annual rainfall for the site is 1,108mm (taken from the nearby Tawhiti at Duffy monitoring station long-term annual average to 2023). As with the other South Taranaki coastal sites, this site is subject to strong winds.

Photo 3 Landfarming area M2110 2021 (image provided by WRS)

Figure 1 WRS Symes Manawapou Landfarm extent and regional location

Site data

Location	
Word descriptor:	Manawapou Road, Manutahi, Taranaki
Map reference:	E 1717244
(NZTM)	N 5608736
Mean annual rainfall:	1,108mm
Mean annual soil temperature:	~15.1°C
Mean annual soil moisture:	~32.9%
Elevation:	~40m
Geomorphic position:	Dune backslope
Erosion / deposition:	Erosion
Vegetation:	Pasture, dune grasses
Parent material:	Aeolian deposit
Drainage class:	Free/well draining

1.4 Resource consents

The Company holds one resource consent, the details of which are summarised in the table below. Summaries of the conditions attached to each permit are set out in Section 3 of this report.

A copy of the consent issued by the Council is included in Appendix I.

Table 1 Consent held by the Company

Consent number	Purpose	Granted	Review	Expires
Discharge of wastes to land				
7795-1.1	To discharge drilling wastes (consisting of drilling cuttings and drilling fluids from water based muds and synthetic based muds), from hydrocarbon exploration and production activities; and Sediment retention pond sludge from water treatment plants onto and into land via landfarming	(May 2012) December 2020	June 2025	June 2028

1.5 Monitoring programme

1.5.1 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 Symes Manawapou Landfarm consisted of four primary components.

1.5.2 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.

1.5.3 Site inspections

The Symes Manawapou Landfarm was visited twice during the monitoring period. The main points of interest were the storage of material in fit for purpose cells, the management of stormwater, the scale of revegetation of previously landfarmed areas, housekeeping and record keeping. The neighbourhood was also surveyed for environmental effects.

1.5.4 Chemical sampling

Soil, groundwater, and surface water monitoring form part of the annual compliance monitoring programme for the Manawapou Landfarm. Previously landfarmed areas had been sown into pasture and had shown good growth. Soil samples were collected during June 2024, while groundwater samples were collected three times, and surface water once in June 2024.

Groundwater monitoring

The facility, as part of its consented obligations, contains an active groundwater monitoring network which is comprised of four groundwater monitoring bores. These bores were sampled three times this monitoring year with the aim to identify the seasonal groundwater level fluctuation and monitor for any adverse effects. Sampling is undertaken using a peristaltic pump, with samples collected once field parameters have been stable for three consecutive readings. Field parameters were captured via a Yellow Springs Instrument (YSI) multi parameter probe.

Groundwater analysis parameters

- Barium (dissolved and acid soluble), chloride, conductivity (@ 25°C), sodium, total dissolved salts (TDS), pH;
- Benzene, ethylbenzene, total petroleum hydrocarbons (speciated), toluene, meta-xylene, ortho-xylene, and
- In-situ readings: pH, conductivity, dissolved oxygen (DO), temperature and water level.

Soil monitoring

Soil sampling is undertaken to assess the concentration of target contaminants within the soil, within a landfarmed area. The methodology utilised by the Council for the collection of soil samples was adapted from the Guidelines for the Safe Application of Biosolids to land in New Zealand (2003). A soil corer is inserted to a depth of 400mm +/- to encompass the zone of drilling mud application. Ten soil cores are collected in a line, with ten metre spacing between each sample. These ten soil cores are then composited to gain one representative soil sample of a landfarm application area.

Soil analysis parameters

- Total heavy metals (arsenic, cadmium, chromium, copper, mercury, nickel, lead and zinc) and barium;
- Chloride, conductivity, calcium, magnesium, potassium, sodium, sodium adsorption ratio (SAR) and soluble salts;
- Total petroleum hydrocarbons (C_7-C_9, C_{10}-C_{14}, C_{15}-C_{36} and C_7-C_{36}), poly-cyclic aromatic hydrocarbons and mono-cyclic aromatic hydrocarbons;
- BTEX (benzene, toluene, ethylbenzene, m&p-Xylene and o-Xylene); and
- Moisture factor.

Surface water monitoring

A surface water sample is collected from Lake Taumaha annually. The aim of this sample is to provide a brief chemical assessment of the surface water body, to determine if there are any potential adverse effects.

- Total petroleum hydrocarbons, benzene, toluene, ethylbenzene, and xylenes (BTEX).
- Temperature, electrical conductivity, chloride, sodium, pH, total dissolved solids and acid soluble barium.

1.5.5 Provision of consent holder provided data

As required by resource consent (7795-1.1, condition 13), the Company provided the Council with an annual report on the consent holder's operations in the 2023/24 monitoring period. This report contains information relating to the receipt, handling, storage and disposal of wastes.

2. Results

2.1 Inspections

30 January 2024

The inspection found that the area in front of the pits that was most recently land farmed has good pasture growth. Land spreading activities are still being undertaken on the seaward side of this area but were not occurring at the time of inspection. A pit that had previously been constructed at the lower point of this area now has a ditch which surrounds the pit. This drain has been dug down to aid infiltration and for preventing stormwater runoff from the landfarmed area. Storage Pit 1 was full. Pit 2 remains decommissioned however, it did contain water below the rip in the lining (previously noted). Pit 3 was approximately half-full and Pit 4 had a mix of some liquid and sediment.

9 May 2024

An inspection was undertaken to assess compliance with resource consent conditions. Pit 1 has a mix of solids and liquids and was fairly full. There was a pile of untreated sawdust stockpiled at the one end of Pit 1, which will be used to mix with some of the slurry to enable materials handling prior to cleaning out Pit 1. Pit 2 remains decommissioned. Pit 3 had some rainwater sitting in it and Pit 4 fairly full of liquid. There was good pasture growth on the previously landfarmed areas. Land spreading activities continue on the seaward side, but were not occurring at the time of inspection.

Overall, there were no issues to note and the Company was found compliant at the time of both inspections.

2.2 Results of receiving environment monitoring

2.2.1 Groundwater monitoring

The Symes Manawapou Landfarm contains four groundwater monitoring bores (Figure 2). The bores were installed as part of the consent and have been monitored since October 2012. They were installed to assess the quality of the groundwater; in close proximity to the storage cells in the case of GND2300 and GND2301, and the landfarming exercise, in the case of GND2302 and GND2303.

During the second half of the 2022/23 monitoring period GND2303 it was determined by camera to be permanently damaged. Since then it has not been possible to obtain a groundwater sample from this monitoring bore, and no samples were obtained during 2023/24.

During August 2023 there was very little water in bore GND2301 bore and it was not feasible to obtain a sample. Since then no samples have been obtained as the bore is dry. Logging and cleaning out with an air compressor was carried out during February 2024 (Strata Drilling Services, 2024) of all four bores on site. Bore GND2301 was determined to be a dry well with no signs of water. This has been the case throughout the whole monitoring year, therefore no samples were obtained during 2023/24 for this bore. It is possible that this is attributed to the lower than average rainfall recorded in this area.

The work carried out by Strata Drilling Services included airlifting and cleaning out the bores. The objective was to enable re-definition of the true total depth and groundwater levels in the bores, to assist with greater resolution of the piezometric gradient of the area. For all bores, except GND2303, well total depth was sounded and sediment airlifted. It was noted that there was a very slow recovery of the standing water level not stabilising within four hours in all the bores. Further work by the Company is being considered to try and establish the true piezometric gradient of the consented area, but no timeframe has currently been established.

Three monitoring rounds were undertaken across two bores. These were obtained through the year aiming to practicably assess for seasonal variation. The analysis of the monitoring rounds are provided in the following Tables 2 to 3.

Where the analyses of total petroleum hydrocarbons (C_7-C_9, C_{10}-C_{14}, C_{15}-C_{36}) and benzene, toluene, ethylbenzene and xylenes (m, o & p) (collectively termed BTEX), were recorded below the laboratory defined limit of detection (LOD) they have not been tabulated.

Figure 2 WRS Symes Manawapou Landfarm groundwater monitoring locations

GND2300 is located in close proximity to the storage cells of Symes Manawapou Landfarm. The results of the four rounds are provided in Table 2.

Table 2 GND2300 2023/24 monitoring period

GND2300	Collected	16 Aug 2023	31 Jan 2024	5 Jun 2024
Parameter	Time	12:00	13:10	13:30
TEMP	°C	15.3	16.5	16.6
Electrical Conductivity (EC)	µS/cm	1290	1265	1566
	mS/m	129.1	126.5	156.6
Total Dissolved Solids (TDS)	g/m³	780	750	970
Acid Soluble Barium	g/m³	< 0.11	< 0.11	< 0.11
Dissolved Barium	g/m³	0.044	0.047	0.056
Chloride	g/m³	154	260	380
Total Sodium	g/m³	115	125	136
pH	pH Units	6.4	6.4	6.4
Toluene	g/m³	<0.001	0.0013	0.0066

- Electrical conductivity (EC) remained relatively stable throughout the monitoring year, with a slight rise in June 2024 (range 129.1 to 156.6mS/m). When compared to the long term record, there has been a general reduction in EC since 2019. However, levels do fluctuate considerably and there was a marginal rise in levels in the latter part of this monitoring period (Figure 3).
- Total dissolved solids (TDS), demonstrated stability in the first part of the monitoring year then an increase in June. Over the long term record, this parameter has recorded a reduction in concentration since 2019. However, as with conductivity, levels continue to fluctuate, and there was a slight rise in levels in the latter part of this monitoring period (Figure 4). Levels were well below the consenting limit of 2,500g/m^3.
- Acid soluble barium remained below the laboratory defined LOD, across all three monitoring rounds this period.
- Dissolved barium remained of low concentration across all three samples analysed. Ranging from 0.044-0.056g/m^3, slightly higher than the previous monitoring year.
- Chloride results ranged 154-380g/m^3, very similar to the previous monitoring year. This analyte gradually increased through the monitoring period. This similarly echoes total dissolved solids and conductivity results over time, with a rise in concentration during the latter part of this monitoring period (Figure 5).
- Sodium results ranged 115-136g/m^3, almost identical to the previous year, and showed a slight increasing trend over the period, similar to chloride.
- pH results remained stable and weakly acidic, at 6.4pH.
- Traces of toluene was present in the latter two samples of the period, but no total petroleum hydrocarbons (TPH) nor benzene, ethylbenzene, xylenes (BTEX) were recorded above the LOD.

Figure 3 Long term EC monitoring GND2300 2012-2024

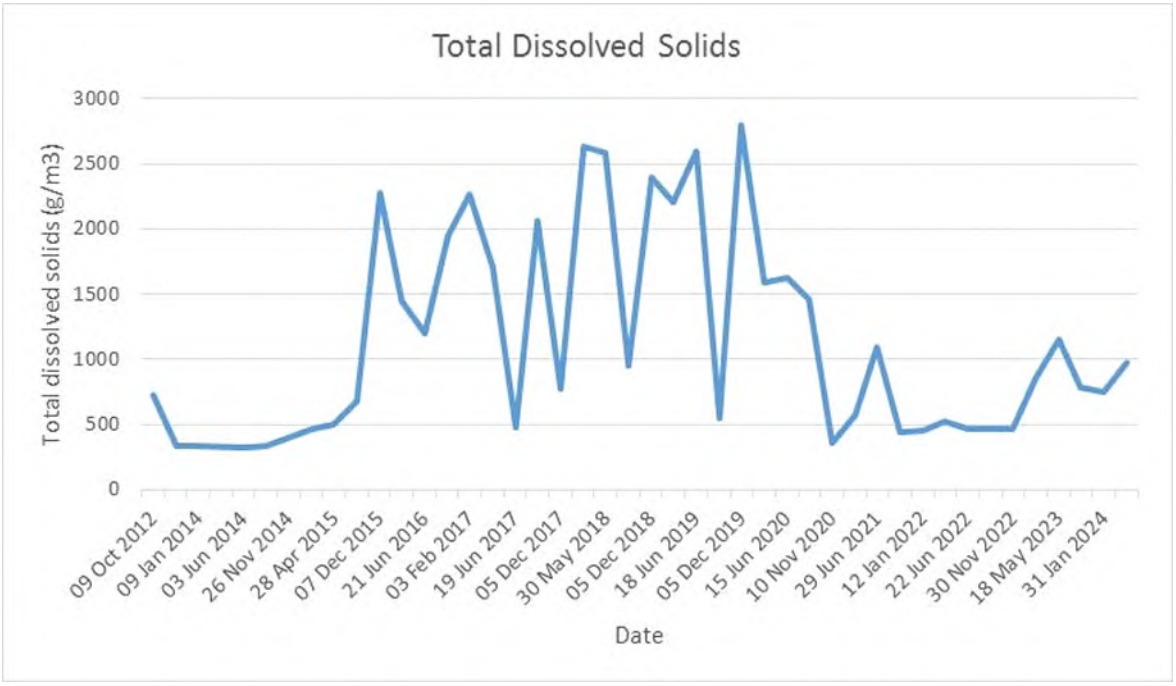

Figure 4 Long term TDS monitoring GND2300 2012-2024

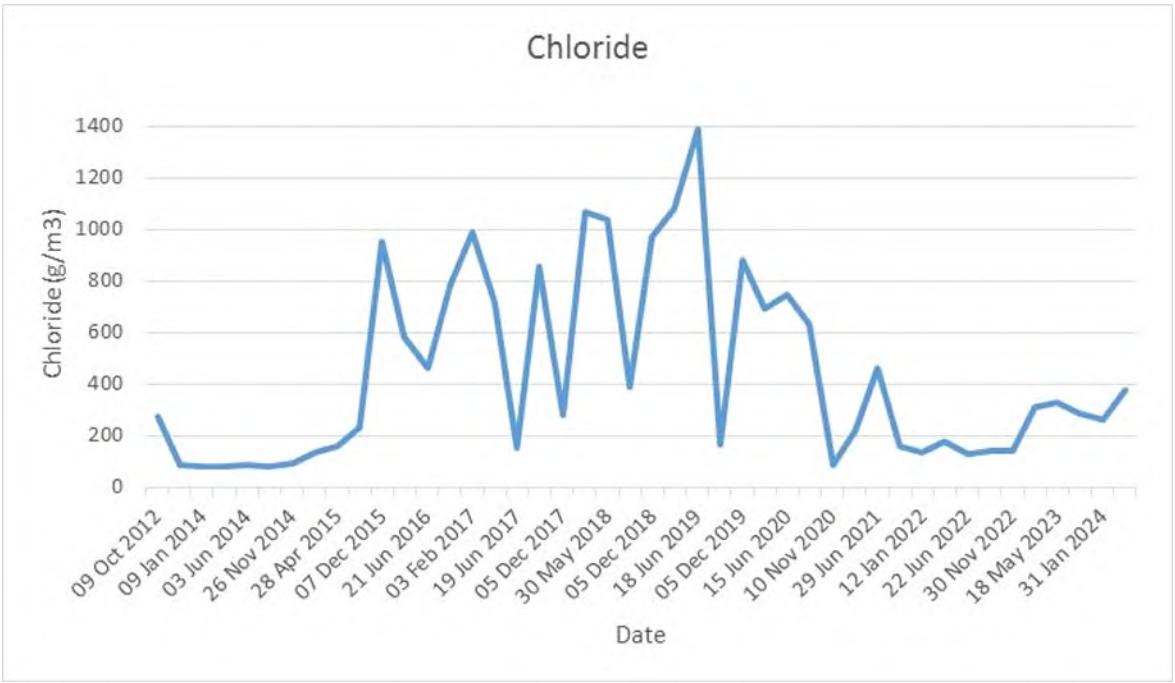

Figure 5 Long term chloride monitoring GND2300 2012-2024

There were no samples obtained for bore GND2301 this period, as the bore was dry for the entire year under review (as discussed above).GND2302 is located in the north western corner of the site, in the older landfarmed areas, which were farmed prior to the Company involvement at the site. The results are presented in Table 3.

Table 3 GND2302 2023/24 monitoring period

GND2302	Collected	16 Aug 2023	31 Jan 2024	5 Jun 2024
Parameter	Time	10:40	14:16	12:30
TEMP	°C	14.4	15.9	15.2
Electrical Conductivity (EC)	µS/cm	725	672	651
	mS/m	72.5	67.2	65.1
Total Dissolved Solids (TDS)	g/m^3	480	410	420
Acid Soluble Barium	g/m^3	< 0.11	< 0.11	< 0.11
Dissolved Barium	g/m^3	0.026	0.026	0.022
Chloride	g/m^3	115	106	99
Total Sodium	g/m^3	55	58	58
pH	pH Units	6.6	6.5	6.7

- EC has recorded an annual increase in this parameter since 2017 peaking in 2020, and has fluctuated since. The results in this monitoring period remained stable, and lower than the previous year, ranging 65.5-72.5mS/m. Over the long term record this parameter has recorded a steady increase in concentration over time (Figure 6). The results from this monitoring period suggest that there continues to be a general downward trend in concentration since peaking in 2020.
- TDS remained stable throughout the monitoring period, with a lower range than the previous year 410-480g/m^3. The long term record (Figure 7) suggests an overall steady increase in this parameter. However, TDS continues to record a reducing concentration since peaking in 2020, with fluctuations. Concentrations remain below the consented limit.
- Acid soluble barium was below the LOD.
- Dissolved barium remained of low concentrations, ranging 0.022-0.026g/m^3.
- Chloride remained stable for the monitoring period, ranging 99-115mg/kg, also lower than the previous monitoring period. The long term record indicates a steady increase over time (Figure 8), and similar to other parameters, having peaked in 2020 there is now an overall downward trend. Concentration levels continue to fluctuate.
- Sodium was also stable and marginally lower than the previous monitoring year, 55-58g/m^3.
- pH remained relatively stable and weakly acidic, ranging 6.5-6.7pH.
- No TPH or BTEX were recorded above the LOD in any of the three monitoring rounds.

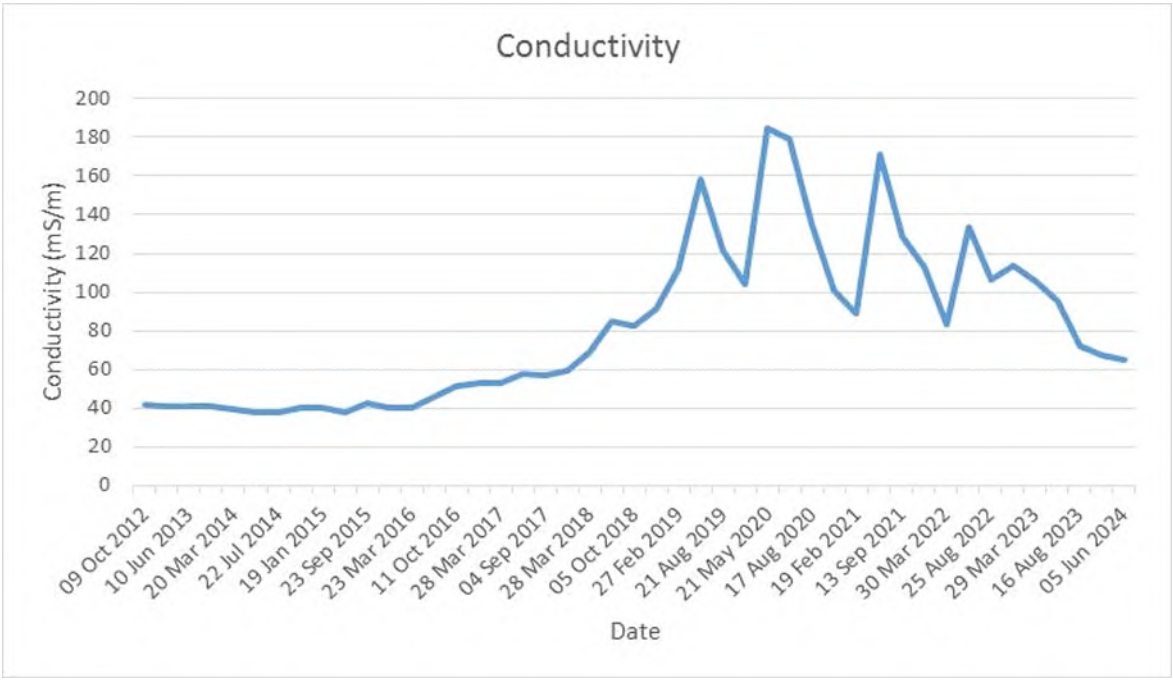

Figure 6 Long term EC monitoring GND2302 2012-2024

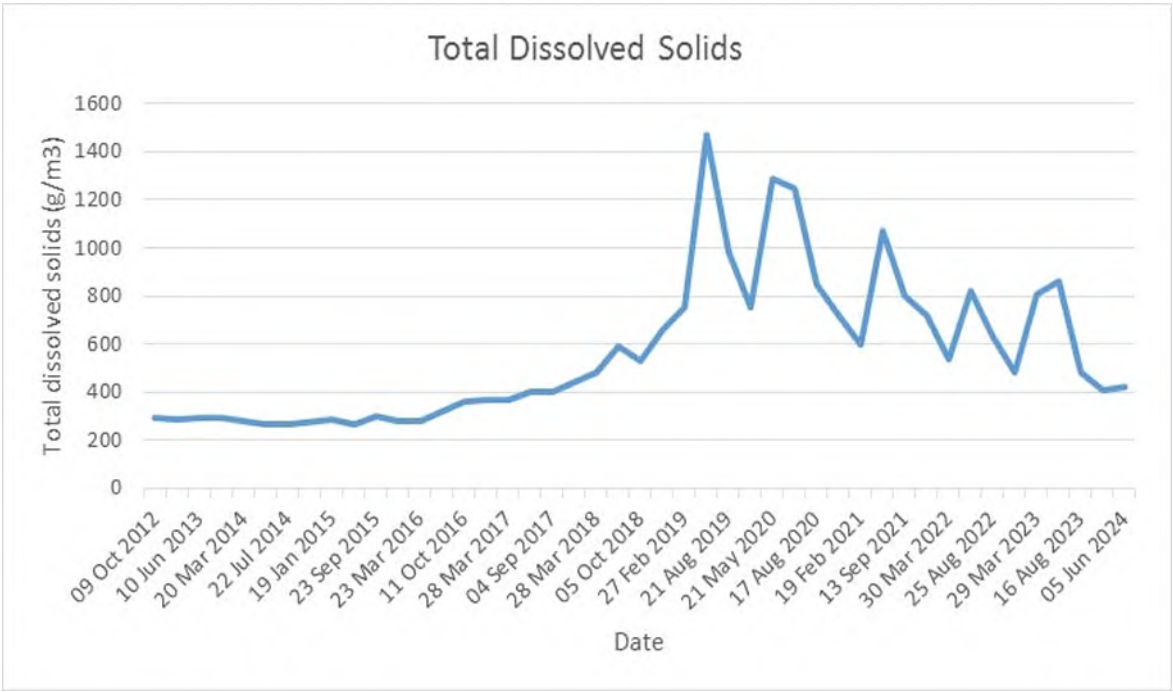

Figure 7 Long term TDS monitoring GND2302 2012-2024

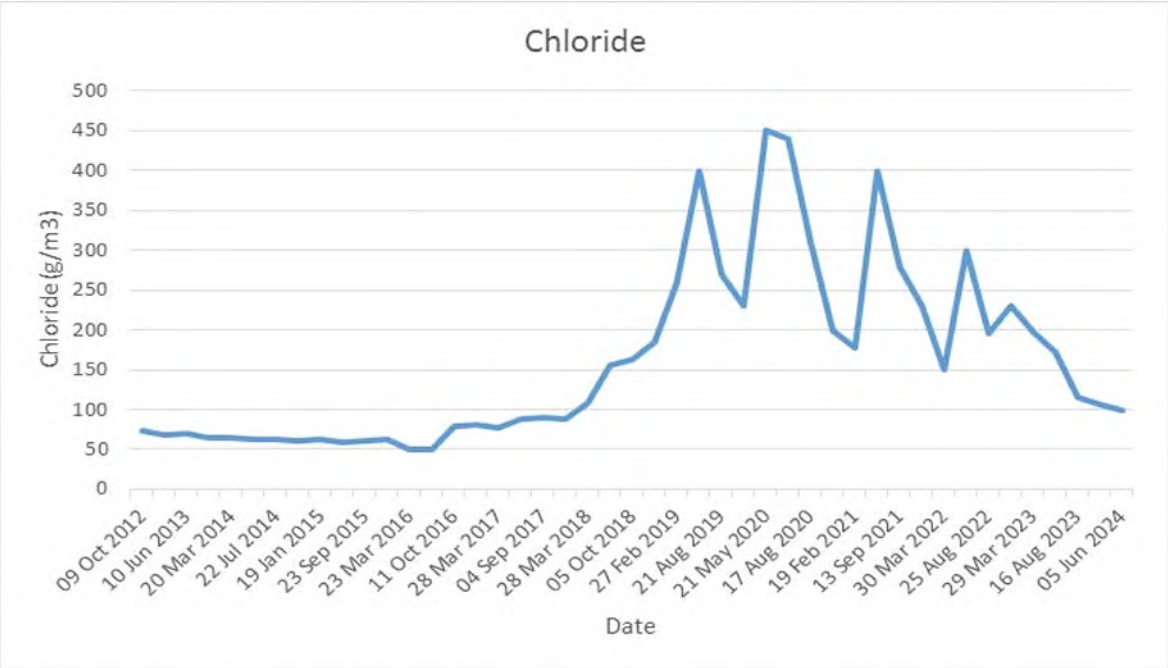

Figure 8 Long term chloride monitoring GND2302 2012-2024

GND2303 is located on the north eastern side of the site, close to the older landfarmed areas of the site and area M1408. This well was damaged by heavy hedge cutting machinery during the 2020/21 monitoring period, and the Company repaired the bore during February 2022, and routine sampling was able to continue in March 2022. However, this bore has continued to cause issues for obtaining a groundwater sample. Investigation was subsequently carried out by the Company during 2023 by sending a camera down the bore. It was determined that the casing had pulled apart, most likely as a result of the previous damage it sustained during the 2020-2021 monitoring period. The bore was determined to be permanently damaged. No samples were, therefore, obtained from this monitoring bore during 2023/24.

For reference any prior results and trends for bores GND2301 and GND2303 can be found in the previous Council monitoring programme annual report 2022/23.

2.2.2 Surface water monitoring

A surface water sample (Table 4) was collected from Lake Taumaha (Figure 9) this monitoring period during June 2024.

Figure 9 Sample location Lake Taumaha

Table 4 Lake Taumaha surface water sample

LTM00001	Collected	5 Jun 2024
Parameter	Time	10:10
TEMP	°C	11.1
Electrical Conductivity (EC)	µS/cm	453
	mS/m	45.3
Total Dissolved Solids (TDS)	g/m³	280
Acid Soluble Barium	g/m³	< 0.11
Chloride	g/m³	77
Total Sodium	g/m³	44
pH	pH Units	8.1
C7 - C9	g/m³	< 0.10
C10 - C14	g/m³	< 0.2
C15 - C36	g/m³	< 0.4
Total hydrocarbons (C7 - C36)	g/m³	< 0.7
Benzene	g/m³	< 0.0010
Toluene	g/m³	< 0.0010
Ethylbenzene	g/m³	< 0.0010
m&p-Xylene	g/m³	< 0.002
o-Xylene	g/m³	< 0.0010

- EC was recorded at 45.4mS/m, which is similar to the previous three monitoring periods (38.3-41.2mS/m).
- TDS was recorded at 280g/m^3, which is comparable to the previous monitoring period (240g/m^3).
- Acid soluble barium remains below the LOD.
- Chloride was recorded at 77g/m^3, which is within range of the previous three sample periods (68-74g/m^3).
- Sodium was recorded at 44g/m^3, which is similar to the previous three monitoring periods, ranging 39-42g/m^3.
- No TPH or BTEX were recorded above the LOD this monitoring period.
- The water quality of the lake is as expected for a small coastal lake. There is no evidence of an effect from the landfarming activities in the locality.

2.2.3 Soil monitoring

Three transects were taken from the completed landfarmed section within area M2110 (Stage II Phase 1). A further three transects were taken from the more recently completed section of area M2110 (Stage II Phase 2).

All previously landfarmed areas (RNZ, M1408, M1610, and M1810, Figure 13) have been surrender-assessed and found to be within criteria that would enable them to be removed from the consent. However, the Company has not yet elected to have these surrendered.

While the previously landfarmed areas are still part of the consent they are considered live and remain zoned temporary industrial. As such no livestock may graze these areas until they have been removed from the resource consent and this is recognised by the District Council who advises on the status of a parcel of land.

During 2023/24 period there was a reasonably high level of activity during the latter half of 2023. With the suspension of drilling by Todd Energy in late 2023, there was a significant reduction in material to be remediated during the first half of 2024. The site has received drilling/production waste remediation materials principally from Todd Energy, Beach Energy and OMV. Preparation of spreading area Stage II/Phase 3 (5.4ha) seaward and south of site M2110 was completed late 2022. Spreading and incorporation of material continues at the conclusion of the monitoring period, going into the next monitoring year.

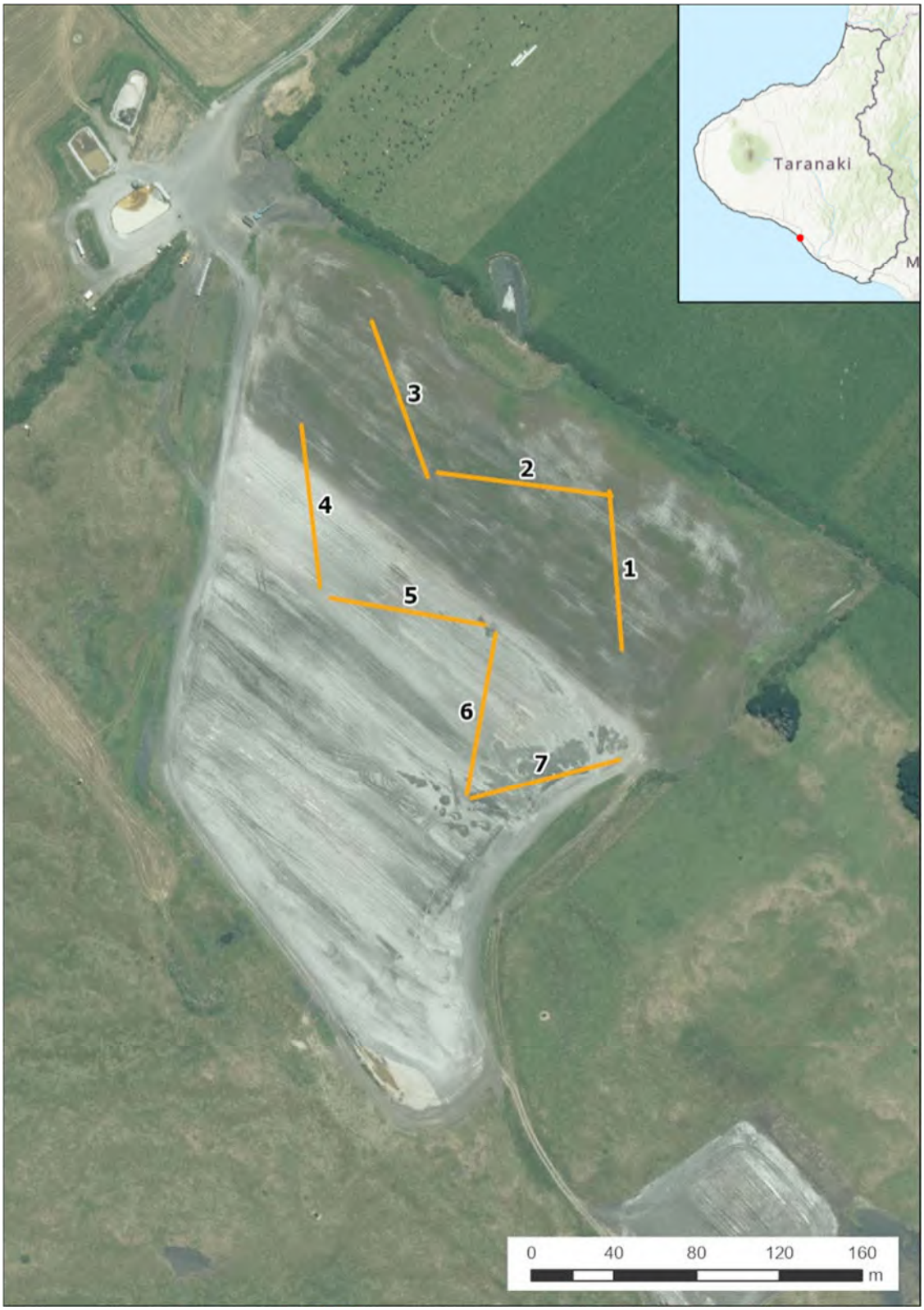

Figure 10 Location of soil transects in relation to WRS Symes Manawapou Landfarm for 2023/24

The analysis is provided in Table 5. It can be noted that the organonitro and organophosphorus pesticides which did not record results above the LOD are not tabulated. This includes analytes which are defined in the consent by a limit.

Table 5 Soil results for 2023/24

WRS Symes Manawapou	Area M2110	**Transect number**	Transect 1	Transect 2	Transect 3	Transect 4	Transect 5	Transect 6	Transect 7
Soil samples 2023/24	Date collected	**Consent surrender limit 7795-1**	5 June 2024	5 June 2024	5 June 2024	5 June 2024	5 June 2024	5 June 2024	5 June 2024
Parameters	Unit/Time		10:55	11:35	12:05	12:40	13:05	13:30	13:50
Dry Matter (Env)	g/100g as rcvd		89	88	87	86	88	89	88
pH	pH Units		8.1	8.1	8.1	7.7	8.9	8.8	8.8
Benzo[a]pyrene (BAP)	mg/kg dry wt	**<0.027**	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
Naphthalene	mg/kg dry wt	**7.2**	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
Perylene	mg/kg dry wt		<0.012	0.014	<0.012	0.025	<0.012	<0.012	<0.012
Phenanthrene	mg/kg dry wt		<0.012	<0.012	0.012	0.013	0.013	<0.012	<0.012
Pyrene	mg/kg dry wt	**160**	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
1-Methylnaphthalene	mg/kg dry wt		< 0.012	< 0.012	0.012	0.024	0.012	<0.011	0.020
2-Methylnaphthalene	mg/kg dry wt		< 0.012	0.017	0.017	0.036	0.014	0.012	0.031
Total of Reported PAHs in Soil	mg/kg dry wt		< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Conductivity from soluble salts	mS/cm	**2.9**	0.3	0.4	0.2	0.5	0.6	0.4	0.5
Chloride	mg/kg dry wt	**700**	230	320	148	390	450	175	260
Total Recoverable Calcium	mg/kg dry wt		10100	10100	9600	10000	17100	11200	14100
Total Recoverable Magnesium	mg/kg dry wt		3100	3100	3500	3000	4100	3400	3900
Total Recoverable Potassium	mg/kg dry wt		1110	1070	830	1080	1480	1020	1420
Total Recoverable Sodium	mg/kg dry wt	**460**	430	450	500[2]	480	530	440	500
Soluble Salts	g/100g dry wt	**0.25**	0.11	0.14	0.07	0.09	0.15	0.14	0.16
Sodium Absorption Ratio (SAR)	$mmol/L^{0.5}$	**<18**	2.1	2.2	2.3	3.3	5.2	4.6	3.7
Benzene	mg/kg dry wt	**1.1**	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Toluene	mg/kg dry wt	**68**	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

[2] Figures in red are above the consent surrender limit.

WRS Symes Manawapou	Area M2110	**Transect number**	Transect 1	Transect 2	Transect 3	Transect 4	Transect 5	Transect 6	Transect 7
Soil samples 2023/24	Date collected	**Consent surrender limit 7795-1**	5 June 2024	5 June 2024	5 June 2024	5 June 2024	5 June 2024	5 June 2024	5 June 2024
Ethylbenzene	mg/kg dry wt	**53**	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
m&p-Xylene	mg/kg dry wt	**48**	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
o-Xylene	mg/kg dry wt	**48**	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
C_7 - C_9	mg/kg dry wt	**<120**	< 20	< 20	< 20	< 20	< 20	< 20	< 20
C_{10} - C_{14}	mg/kg dry wt	**<58**	610	660	800	1100	930	680	820
C_{15} - C_{36}	mg/kg dry wt	**<4,000**	4400	4800	4600	7700	6800	6100	7200
Total hydrocarbons (C_7 - C_{36})	mg/kg dry wt		5000	5500	5400	8800	7600	6800	8000
Total Recoverable Barium	mg/kg dry wt		5200	4300	5200	2900	4800	4000	5600
Total Recoverable Arsenic	mg/kg dry wt	**20**	6	3	4	3	3	2	3
Total Recoverable Cadmium	mg/kg dry wt	**1**	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	**600**	30	27	24	24	35	28	29
Total Recoverable Copper	mg/kg dry wt	**100**	20	18	18	17	19	15	17
Total Recoverable Lead	mg/kg dry wt	**300**	7.4	5.1	4.8	5.0	6.5	5.2	7.2
Total Recoverable Mercury	mg/kg dry wt	**1**	0.48	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.27
Total Recoverable Nickel	mg/kg dry wt	**60**	12	12	11	12	17	13	15
Total Recoverable Zinc	mg/kg dry wt	**300**	94	90	88	81	112	94	100
Permethrin	mg/kg dry wt		1.06	1.12	1.4	1.17	0.79	0.81	0.75
Propiconazole	mg/kg dry wt		1.1	1.0	1.8	0.9	0.7	0.6	0.6
Tebuconazole	mg/kg dry wt		<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Calcium (Sat Paste)	mg/L		312	387	233	400	479	291	365
Magnesium (Sat Paste)	mg/L		45	55	32	64	90	51	67
Sodium (Sat Paste)	mg/L		152	172	142	272	477	326	326

The analysis of the soil samples indicated the following:

- Sodium absorption ratio (SAR) ranged from 2.1 to 5.2mmol/$L^{0.5}$, the limit is set at <18mmol/$L^{0.5}$. These concentration levels are well below the consent surrender limit.
- In terms of petroleum hydrocarbons:
  - C_7-C_9 was not recorded above the LOD.
  - C_{10}-C_{14} ranged 460-1600mg/kg. The limit for surrender is set at <58mg/kg. All these transects are currently above the limit for surrender. However, the concentration is decreasing.
  - C_{15}-C_{36} ranged 4400-7700mg/kg; the limit for surrender is <4,000mg/kg. All samples were over the limit, but are trending downwards with time.
- Chloride ranged 175-450mg/kg. The surrender concentration must be below 700mg/kg, all samples continue to remain below this limit.
- Total recoverable sodium ranged 430-530mg/kg with three transects below the limit of surrender (460mg/kg).
- Traces of permethrin and propiconazole (organonitro & organophosphorus based pesticides) were recorded above the LOD this monitoring period, as they were during the previous monitoring period. However, this monitoring period there were no traces of tebuconazole.
- Area M2110 due to concentrations of TPH C_{10}-C_{14} & C_{15}-C_{36} and total recoverable sodium being above consent criteria of surrender will need further monitoring.

Photo 4 Completed and grassed Area M2110 Stage II (May 2024)

2.3 Consent holder provided information

The Company provided the Council with an annual report, as required by condition 13, of consent 7795-1.1. A copy of the Company report is attached in Appendix II. Table 6 contains the delivery record for material accepted by the landfarm during this monitoring period. Figure 11, also provided by the Company, is a map of the previous and current landfarming operations.

During 2023/24 there has been a low level of activity at the site, with a total of 5,078m^3 of both solid and liquid wastes received. The site received small quantities of drilling/production material for remediation from Todd Energy, Beach Energy, OMV/Intergroup, NZEC, Halliburton and Nova Energy.

Table 6 WRS Symes Manawapou Landfarm drilling waste delivery record 2023/24 in cubic metres

Date	Source	Customer	Solid	Liquid	Total
July 2023	Kapuni J KA 28	Todd Energy	129	541	670
July to December 2023	Kapuni J KA 27	Todd Energy	722	1058	1780
September 2023	Kapuni J KA 25	Todd Energy	0	2	2
July to September 2023	Kapuni Production Station	Todd Energy	55	21	76
July 2023	Intergroup Yard MB04	OMV	0	10	10
August 2023	OMV MB 08	OMV	0	192	192
July 2023 to May 2024	Kupe MEG	Beach	0	631	631
August 2023 to February 2024	Halliburton LBMP	Halliburton	0	757	757
August 2023	MHW D Skimmer Pit	Todd Energy	24	0	24
August 2023	Nova WTP	Nova	0	360	360
November 2023	Kapuni J KA06	Todd Energy	173	0	173
February to March 2024	NZEC Waihapa	NZEC	0	121	121
April 2024	Todd MHW/MMPS Stream	Todd Energy	0	30	30
April 2024	Todd KGTP	Todd Energy	0	17	17
April 2024	Todd Sawdust	Todd Energy	90	0	90
May 2024	Symons Yard	Symons	0	38	38
June 2024	Pohokura POW-05	OMV	36	71	107
ANNUAL TOTAL TO 30 JUNE 2024 (m^3)			**1229**	**3849**	**5078**

(adapted from the Company Annual Report)

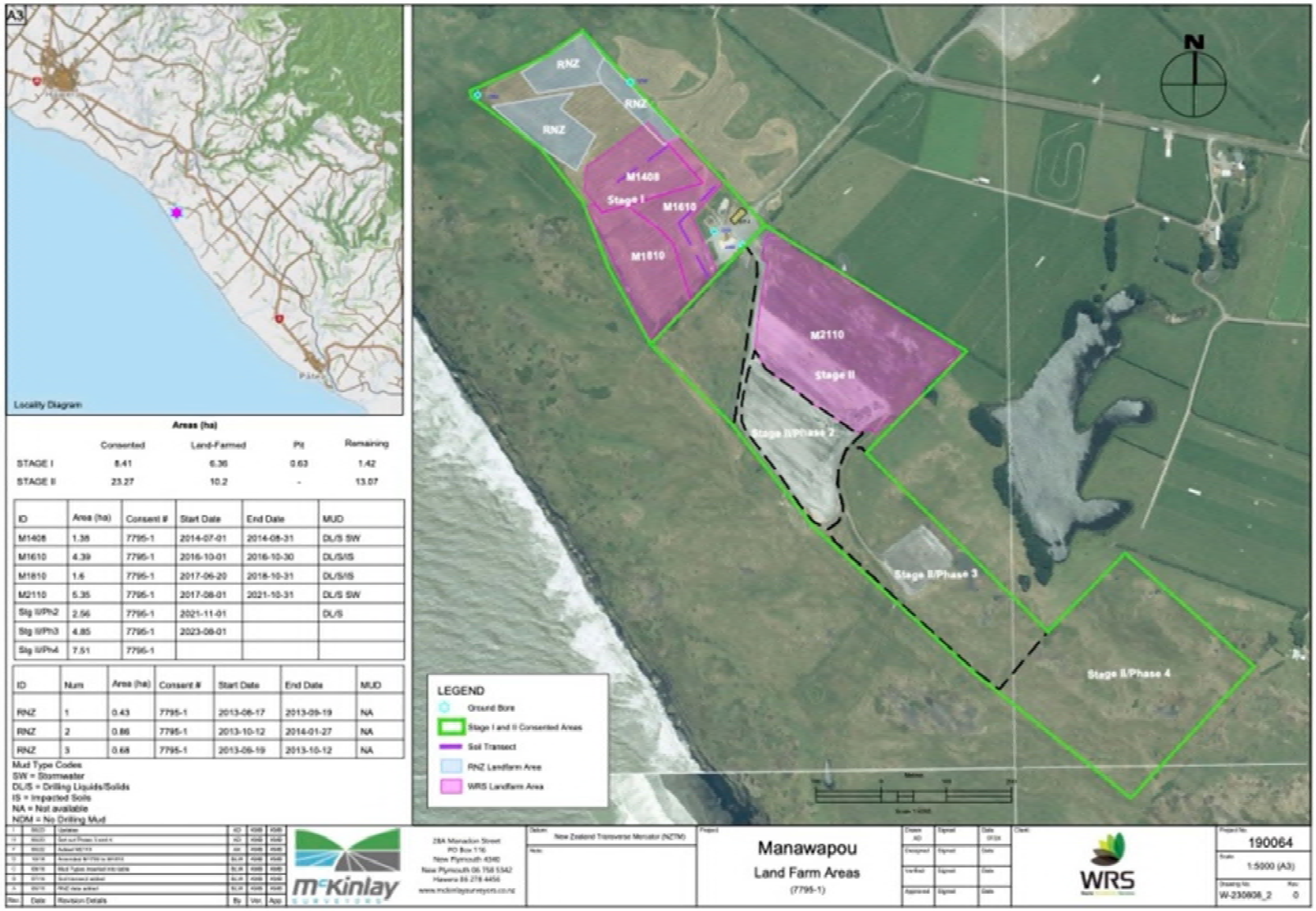

Figure 11 WRS provided map of landfarmed areas

2.4 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 the Company. 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.

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 Site performance

The Symes Manawapou Landfarm observed a low level of activity, with 5,078m^3 of both solid and liquid waste from several sources accepted to site. The Company has landfarmed the site in two stages, which are illustrated in Figure 11.

During the previous monitoring period spreading operations commenced in a new area (Phase 3) in Stage II of the Manawapou site (Figure 11). Disposal in this area continued during 2023/24 and was still underway at the end of June 2024 (Photo 5).

Notifications were provided to the Council of material delivered to the site and of landfarming operations. In addition, drilling waste analysis and the Company annual report, which are a requirement of the consent (7795-1.1) have been provided by the Company for this monitoring period.

Composite samples are taken across each waste stream before materials leave the well/source site for delivery. In the past, the Company took pre-spreading samples from the pits prior to land spreading for further waste characterisation. Presently, the pits are now merely transfer points from road trucks to agricultural machines with the receipt of waste and spreading often daily. For this reason, pre-spreading wastes no longer provides further information that might be expected from storage of material in the pits for long periods of time.

There were two inspections carried out by the Council during this monitoring period, and the Company was compliant on both occasions.

During a prior monitoring period (2021/22) the liner of Pit 2 had been accidently ripped. Subsequently Pit 2 had been decommissioned until repairs could be undertaken. During this time rainwater levels in the pit were maintained below the rips by regular vacuum tank removal of the liquid. Pit 2 was repaired during June 2024, and the site now has four operational pits once again.

It was agreed previously by the Council and the Company that bore GND2303 would be decommissioned for the time being as a monitoring bore due to damage initially sustained by hedge trimming operations. Deep well damage had been identified by camera, and a decision with regard to the replacement or relocation of the bore will be determined post the 2024/25 monitoring year.

Work was undertaken to airlift and clean out the bores during February 2024 enabling re-definition of the true total depth and groundwater levels in all the bores to assist with greater resolution of the piezometric gradient of the area. Most bores (except GND2303) well total depth was sounded and sediment airlifted from the bore. It was noted at the time of this exercise that there was a very slow recovery of the standing water level not stabilising within four hours in all the bores.


Photo 5 Mud drying in spread area (left) and spreading liquids (right), Stage II/Phase 3 (2023/24)

(Images provided by WRS)

3.2 Environmental effects of exercise of consents

Environmental effects associated with the Symes Manawapou Landfarm were mainly related to moderate saline impacts to groundwater, as recorded in the monitoring bores.

Salts mobilise in water; the elevations previously observed are likely a result of salts leaching from previous landfarmed areas into the groundwater and these salts gradually moving towards the coast. During this monitoring period bore GND2300 and GND2302 saline concentrations were stabilised with a marginal increase in GND2300 during the latter part of the monitoring period. Levels remain lower or similar to previous monitoring periods.

Landfarmed area M2110 soils were sampled this monitoring period. The corresponding results indicated that the parcel of land is still above surrender criteria for mid to high range petroleum hydrocarbons and total recoverable sodium. It should be noted that the site is meeting consent conditions that relate to current site activities.

During the previous monitoring period, the Company demonstrated to the Council that the liners within the pits/cells in use remain fit for purpose. The recommendations within the pit liner report for minor repairs and prevention of further degradation of the areas around the pit were carried out where necessary, including the repair of storage pit 2.

During 2021 a small area of M2110 was landfarmed inadvertently with light organic solvent preserved (LOSP) treated sawdust. Literature on the degradation of LOSP chemicals (used for treatment for timbers) suggests that in the case of permethrin (insecticide), the half-life ranges from 11-113 days in aerobic soils[3]. Propiconazole (fungicide) has a half-life ranging between 40-315 days[4]. While in the case of tebuconazole (fungicide), its half-life ranges from 20-912 days[5]. Traces of the former two chemicals were still present in the soil samples during this monitoring period, but tebuconazole was below the detection limit

[3] http://npic.orst.edu/factsheets/half-life.html

[4] Garrison, Avants and Miller; Loss of propiconazole and its four stereoisomers from the water phase of two soil water slurries as measured by capillary electrophoresis August 2011. International Journal of Environmental Research and Public Health

[5] Ministry for Health New Zealand Volume 3 Datasheets- Chemical and physical determinants Part 2.3 Pesticides 2019 health.govt.nz

(<0.7mg/kg dry wt). Annual soil sampling will continue to assess for the degradation of these three compounds, in addition to normal landfarming soil sample analytes, which are provided in Section 1.5.4.

3.3 Evaluation of performance

A tabular summary of the consent holder's compliance record for the year under review is set out in Tables 7 and 8.

Table 7 Summary of performance for consent 7795-1.1

Purpose: To discharge drilling waste cuttings (consisting of drilling cuttings and drilling fluids from water based muds and synthetic based muds), from hydrocarbon exploration and production activities, onto and into land via landfarming		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Definitions which apply to the consent	N/A	N/A
2. Best practicable option to be adopted	Inspection and liaison with consent holder.	Yes
3. The consent holder shall provide a stockpiling and landfarming management plan prior to the exercise of the consent	Management plan received and approved, latest version 2024.	Yes
4. Before 1 Feb 2025 consent holder to amend management plan referenced by condition 3 to include sediment and retention pond sludge disposal to demonstrate compliance with conditions of consent	Received July 2024.	Yes
5. Install a minimum of three groundwater monitoring wells prior to exercise of consent	Groundwater monitoring wells installed in 2012. Three of four monitoring wells active to consent. One monitoring bore currently decommissioned due to casing damage.	Yes
6. Any pits utilised for the storage of solid or liquid waste shall be lined with fit for purpose synthetic liners or equivalent	Inspection Liner of Pit 2 accidently damaged previously; repair was completed June 2024.	Yes
7. Integrity check of pit liners to be conducted per 24 month period	Received June 2023.	Yes
8. Notify TRC 48 hrs prior to stockpiling	Notifications received when stockpiling.	Yes
9. Notify TRC 48 hrs prior to landfarming	Notifications received when landfarming.	Yes
10. The consent holder shall sample for the following: a. Total petroleum hydrocarbons b. Benzene, toluene, ethylbenzene, xylenes c. Polycyclic aromatic hydrocarbons d. Chloride, nitrogen, pH, potassium, sodium	Predisposal samples analysis supplied by consent holder as requested.	Yes

Purpose: To discharge drilling waste cuttings (consisting of drilling cuttings and drilling fluids from water based muds and synthetic based muds), from hydrocarbon exploration and production activities, onto and into land via landfarming		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
11. The consent holder to take a representative sample of each disposal of sediment retention pond sludge and analyse for the following - dry matter - total recoverable potassium and sodium - chloride - Total nitrogen - Total recoverable arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc and aluminium	No samples received. However, representative sample analysis of the source is supplied prior to transportation and there are no consent limits for discharge of sludge to land.	Yes
12. Keep records relating to wastes, areas, compositions, volumes, dates, treatments and monitoring	Company records provided in annual report	Yes
13. Report on records in condition 9 to Council by 31 August each year	Report received	Yes
14. Discharges made only within area as specified by submitted application	Inspection indicated the discharges occur within the consented area	Yes
15. No discharge within 25m of a water body, 10m from any property boundary and 50m from the QEII covenant Key Native Ecosystems	Inspection indicated the discharges are of sufficient distance from water courses and an earthen bund had been erected to prevent overland flow	Yes
16. Maximum application thickness for wastes: a. 100mm TPH <5% b. 50mm TPH >5% c. No ponded liquids 1 hr after application	Company records, inspection and sample	Yes
17. Incorporation into soil as soon as practicable to a depth of at least 250 mm	Inspection and sampling	Yes
18. Hydrocarbon concentrations in soil shall not exceed 50,000mg/kg dry weight	Sampling	Yes
19. Landfarming areas to be used in accordance with conditions 14 and 15 and shall not be used for any subsequent discharges of drilling wastes	Inspection	Yes
20. All material to be landfarmed as soon as practicable and no later than 12 months	Company records and inspections	Yes
21. Re-vegetate landfarmed areas as soon as practicable	Company records and inspections	Yes
22. Total dissolved salts in any fresh water body shall not exceed 2,500g/m^3	Sampling	Yes
23. Disposal of waste shall not lead to contaminants entering surface water or ground water exceeding background concentrations	Sampling	Yes

Purpose: To discharge drilling waste cuttings (consisting of drilling cuttings and drilling fluids from water based muds and synthetic based muds), from hydrocarbon exploration and production activities, onto and into land via landfarming		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
24. Conductivity must be less than 400mS/m. If background conductivity exceeds 400mS/m, then increase shall not exceed 100mS/m	Sampling	N/A
25. Sodium absorption ratio [SAR] must be less than 18.0, if background SAR exceeds 18.0 then increase shall not exceed 1.0	Sampling	N/A
26. Concentrations of heavy metals in the soil shall at all times comply with MfE guidelines	Sampling	N/A
27. Prior to expiry/cancellation of consent these levels must not be exceeded: a. conductivity, 290mS/m b. chloride, 700g/m^3 c. dissolved salts, 2500g/m^3 d. sodium, 460g/m^3	Areas RNZ 1, 2, 3 and X, M1408, M1610 and M1810 have been assessed against this condition and found to be compliant	N/A
28. If condition 23 is not met, consent cannot be surrendered	Previously landfarmed areas may be surrendered if the soils meet the surrender criteria	N/A
29. Notification of discovery of archaeological remains	Not applicable – none discovered in this monitoring period	N/A
30. Consent shall lapse on 30 June 2017	Not applicable – consent exercised	N/A
31. Optional review provision re environmental effects	Next optional review is due in June 2025. No grounds to exercise a review.	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

Table 8 Evaluation of environmental performance over time

Year	Consent numbers	High	Good	Improvement required	Poor
2019/20	7795-1	1	-	-	-
2020/21	7795-1	-	-	1	-
2021/22	7795-1	-	1	-	-
2022/23	7795-1	1	-	-	-
2023/24	7795-1	1	-	-	-

During the year, the Company demonstrated an overall high level of environmental performance and a high level of administrative performance with the resource consent as defined in Appendix III.

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 at Symes Manawapou Landfarm in the 2023/24 year continue at the same level as in 2022/23.
2. THAT any elevations in groundwater salinity, in excess of condition 22, will require the Company to investigate and mitigate the cause.

3. THAT should there be issues with environmental or administrative performance in 2023/24, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

Prior to the beginning of the monitoring year in review due to reduced activity a decision was determined between the Company and the Council to reduce the frequency of groundwater monitoring and inspections to three sampling rounds and two inspections, respectively. This was duly carried out.

It was not necessary to implement recommendation 2 or 3.

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.

In light of the increased landfarming to the east (Phase 3) additional groundwater monitoring is required in Stage 2, the Council continues to work with the Company on this matter.

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.

It should be noted that the proposed programme represents a reasonable and risk-based level of monitoring for the site 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.

3.6 Exercise of optional review of consent

Resource consent 7795-1.1 provides for an optional review of the consent in June 2025. Condition 31 allows the Council to review the consent, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environmental arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Based on the results of monitoring in the year under review, and in previous years as set out in earlier annual compliance monitoring reports, it is considered that there are no grounds that require a review to be pursued or grounds to exercise the review option.

4. Recommendations

1. THAT in the first instance, monitoring of consented activities at Symes Manawapou Landfarm in the 2024/25 year continue at the same level as in 2023/24.
2. THAT any elevations in groundwater TDS, in excess of condition 22, will require the Company to investigate and mitigate the cause.
3. THAT should there be 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 (1 m^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).
PAH	Polycyclic Aromatic Hydrocarbon
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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Waste Remediation Services (WRS) Manawapou (Symes) Disposal Site Annual Report 2024.

Waste Remediation Services Ltd (WRS), Waikaikai (Wards) & Manawapou (Symes) Landfarm Management Plan 2023/24.

Appendix I

Resource consents held by WRS Ltd Symes Manawapou Landfarm

(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:	Waste Remediation Services Limited PO Box 7150 New Plymouth 4341
Decision Date (Change):	15 December 2020
Commencement Date (Change):	15 December 2020 (Granted Date: 1 May 2012)

Conditions of Consent

Consent Granted:	To discharge: • drilling wastes (consisting of drilling cuttings and drilling fluids from water based muds and synthetic based muds), from hydrocarbon exploration and production activities; and • sediment retention pond sludge from water treatment plants onto and into land via landfarming
Expiry Date:	1 June 2028
Review Date(s):	June 2022, June 2025
Site Location:	156 Manawapou Road, Manutahi
Grid Reference (NZTM)	1717240E-5608740N
Catchment:	Manawapou

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

47 Cloten Road · Private Bag 713 · Stratford 4352 · New Zealand
T: 06 765 7127 · F: 06 765 5097 · E: info@trc.govt.nz · www.trc.govt.nz
www.facebook.com/TaranakiRegionalCouncil twitter.com/TaranakiRC
Please quote our document number in your reply

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. For the purposes of this consent the following definitions shall apply:

    a) stockpiling means a discharge of drilling wastes and/or sediment retention pond sludge from vehicles, tanks, or other containers onto land for the purpose of interim storage prior to landfarming, but without subsequently spreading onto, or incorporating the discharged material into the soil within 48 hours; and
    b) landfarming means the discharge of drilling wastes and/or sediment retention pond sludge onto land, subsequent spreading and incorporation into the soil, for the purpose of attenuation of hydrocarbon and/or other contaminants including sediment retention pond waste, and includes any stripping and relaying of topsoil.

2. The consent holder shall adopt the best practicable option (as defined section 2 of the Resource Management Act 1991) to prevent or minimise any actual or potential effects on the environment arising from the discharge.

Requirements prior to exercise of consent

3. Prior to the exercise of this consent, the consent holder shall provide a stockpiling and landfarming management plan that, to the reasonable satisfaction of the Chief Executive, Taranaki Regional Council, demonstrates the activity can and will be conducted to comply with all of the conditions of this consent. The management plan shall be reviewed annually (on or about the anniversary of the date of issue of this consent) and shall include as a minimum:

    a) procedures for notification to Council of disposal activities;
    b) procedures for the receipt and stockpiling of drilling wastes onto the site;
    c) methods used for the mixing and testing of different waste types;
    d) procedures for site preparation;
    e) procedures for landfarming drilling wastes (including means of transfer from stockpiling area, means of spreading, and incorporation into the soil);
    f) procedures for sowing landfarmed areas, post-landfarming management, monitoring and site reinstatement;
    g) contingency procedures;
    h) sampling regime and methodology;
    i) control of site access; and
    j) documentation for all the procedures and methods listed above.

4. Before 1 February 2025 the consent holder shall amend the stockpiling and landfarming management plan referenced in condition 3 above, to include the disposal of sediment retention pond sludge, and demonstrate its discharge can and will be conducted to comply with all of the conditions of this consent.

5. Prior to the exercise of this consent, the consent holder shall after consultation with the Chief Executive, Taranaki Regional Council, install a minimum of three groundwater monitoring bores. The bores shall be at locations and to depths that enable monitoring to determine any change in groundwater quality resulting from the exercise of this consent. The bores shall be installed in accordance with NZS 4411:2001 and all associated costs shall be met by the consent holder.

6. Any pits intended for the storage of solid or liquid wastes shall be lined with high-grade (fit for purpose) synthetic liners or equivalent so that they retain liquid without leakage through the base or side walls.

7. At intervals not exceeding 24 months the consent holder shall check the integrity of the pit liners, repair or replace liners as required and demonstrate to the Chief Executive, Taranaki Regional Council they retain liquid as required by condition 6.

Notifications, monitoring and reporting

8. The consent holder shall notify the Chief Executive, Taranaki Regional Council at least 48 hours prior to permitting drilling wastes or sediment retention pond sludge onto the site for stockpiling, from each well drilled or sediment retention pond received. Notification shall include the following information:

   a) the consent number;
   b) the name of the well(s) from which the waste was generated or the location of the sediment retention pond from which waste has originated;
   c) the type of waste to be stockpiled; and
   d) the volume of waste to be stockpiled.

   Unless the Chief Executive advises that an alternative method is required the notice required by this condition shall be served by completing and submitting the 'Notification of work' form on the Council's website (http://bit.ly/TRCWorkNotificationForm).

9. The consent holder shall notify the Chief Executive, Taranaki Regional Council at least 48 hours prior to landfarming stockpiled material, or material brought onto the site for landfarming within 48 hours. Notification shall include the following information:

   a) the consent number;
   b) the name of the well(s) from which the waste was generated or the location of the sediment retention pond from which waste has originated;
   c) the type of waste to be landfarmed;
   d) the volume and weight (or density) of the waste to be landfarmed;
   e) the concentration of chlorides, nitrogen and hydrocarbons in the waste; and
   f) the specific location and area over which the waste will be landfarmed.

   Unless the Chief Executive advises that an alternative method is required the notice required by this condition shall be served by completing and submitting the 'Notification of work' form on the Council's website (http://bit.ly/TRCWorkNotificationForm).

10. The consent holder shall take a representative sample of each type of drilling waste, from each individual source, and have it analysed for the following:

    a) total petroleum hydrocarbons (C_6-C_9, C_{10}-C_{14}, C_{15}-C_{36});
    b) benzene, toluene, ethylbenzene, and xylenes;
    c) polycyclic aromatic hydrocarbons screening; and
    d) chloride, nitrogen, pH, potassium, sodium, barium and heavy metals.

11. The consent holder shall take a representative sample of each disposal of sediment retention pond sludge, from each individual source, and have it analysed for the following:

    a) dry matter;
    b) total recoverable: potassium, sodium;
    c) chloride;
    d) pH;
    e) total nitrogen;
    f) total recoverable: arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc, aluminium.

12. The consent holder shall keep records of the following:

    a) wastes from each individual well or sediment retention pond;
    b) composition of wastes (in accordance with condition 8);
    c) stockpiling area(s);
    d) volumes of material stockpiled;
    e) landfarming area(s), including a map showing individual disposal areas with GPS co-ordinates;
    f) volumes and weights of wastes landfarmed;
    g) dates of commencement and completion of stockpiling and landfarming events;
    h) dates of sowing landfarmed areas;
    i) treatments applied; and
    j) details of monitoring, including sampling locations, sampling methods and the results of analysis;

    and shall make the records available to the Chief Executive, Taranaki Regional Council.

13. The consent holder shall provide to the Chief Executive, Taranaki Regional Council, by 31 August of each year, a report on all records required to be kept in accordance with condition 9, for the period of the previous 12 months, 1 July to 30 June.

Discharge limits

14. The discharge shall only occur on the disposal sites shown in the Drawing entitled 'Remediation NZ Ltd Proposed Disposal Site' submitted with the application and attached to this consent.

15. There shall be no discharge within buffer zone, being:

    - 25 metres of the Manawapou River;
    - 25 metres of the unnamed tributary;
    - 10 metres from any property boundary; and
    - 50 metres from the QE II covenant Key Native Ecosystem areas.

16. For the purposes of landfarming, drilling wastes or sediment retention pond sludge shall be applied to land in a layer not exceeding:

    a) 100 mm thick for wastes with a hydrocarbon concentration less than 50,000 mg/kg dry weight;
    b) 50 mm thick for wastes with a hydrocarbon concentration equal to or greater than 50,000 mg/kg dry weight; and
    c) in a rate and manner such that no ponded liquids remain after one hour, for all wastes;

    prior to incorporation into the soil.

17. As soon as practicable following the application of solid drilling wastes or sediment retention pond sludge to land, the consent holder shall incorporate the wastes into the soil to a depth of at least 250 mm.

18. The hydrocarbon concentration in the soil over the landfarming area shall not exceed 50,000 mg/kg dry weight at any point where:

    a) liquid waste has been discharged; or
    b) solid waste has been discharged and incorporated into the soil.

19. An area of land used for the landfarming of drilling wastes in accordance with conditions 14 and 15 of this consent, shall not be used for any subsequent discharges of drilling waste.

Operational requirements

20. All material must be landfarmed as soon as practicable, but no later than twelve months after being brought onto the site.

21. As soon as practicable following landfarming, areas shall be sown into pasture (or into crop). The consent holder shall monitor revegetation and if adequate establishment is not achieved within two months of sowing, shall undertake appropriate land stabilisation measures to minimise wind and stormwater erosion.

Receiving environment limits - water

22. The exercise of this consent shall not result in the concentration of total dissolved salts in any fresh water body exceeding 2500 g/m3.

23. Other than as provided for in condition 22, the exercise of this consent shall not result in any contaminant concentration, within surface water or groundwater, which after reasonable mixing, exceeds the background concentration for that particular contaminant.

Receiving environment limits - soil

24. The conductivity of the soil/waste layer after landfarming shall be less than 400 mS/m, or alternatively, if the background soil conductivity exceeds 400 S/m, the landfarming of waste shall not increase the soil conductivity by more than 100 mS/m.

25. The sodium adsorption ratio (SAR) of the soil/waste layer after landfarming shall be less than 18.0, or alternatively if the background soil SAR exceeds 18.0, the landfarming of waste shall not increase the SAR by more than 1.0.

26. The concentration of heavy metals in the soil over the disposal area shall at all times comply with the Ministry for the Environment and New Zealand Water & Wastes Association's Guidelines for the safe application of biosolids to land in New Zealand (2003), as shown in the following table:

Constituent	Standard (mg/kg dry weight)
Arsenic	20
Cadmium	1
Chromium	600
Copper	100
Lead	300
Mercury	1
Nickel	60
Zinc	300

27. From 1 March 2028 (three months prior to the consent expiry date), constituents in the soil shall not exceed the standards shown in the following table:

Constituent	Standard
conductivity	290 mS/m
chloride	700 mg/kg
sodium	460 mg/kg
total soluble salts	2500 mg/kg
MAHs PAHs TPH	Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand (Ministry for the Environment, 1999). Tables 4.12 and 4.15, for soil type sand.

MAHs - benzene, toluene, ethylbenzene, xylenes
PAHs - napthalene, non-carc. (pyrene), benzo(a)pyrene eq.
TPH - total petroleum hydrocarbons (C_7-C_9, C_{10}-C_{14}, C_{15}-C_{36})

The requirement to meet these standards shall not apply if, before 1 March 2028, the consent holder applies for a new consent to replace this consent when it expires, and that application is not subsequently withdrawn.

28. This consent may not be surrendered at any time until the standards in condition 27 have been met.

Archaeological remains

29. In the event that any archaeological remains are discovered as a result of works authorised by this consent, the works shall cease immediately at the affected site and tangata whenua and the Chief Executive, Taranaki Regional Council, shall be notified within one working day. Works may recommence at the affected area when advised to do so by the Chief Executive, Taranaki Regional Council. Such advice shall be given after the Chief Executive has considered: tangata whenua interest and values, the consent holder's interests, the interests of the public generally, and any archaeological or scientific evidence. The New Zealand Police, Coroner, and Historic Places Trust shall also be contacted as appropriate, and the work shall not recommence in the affected area until any necessary statutory authorisations or consents have been obtained.

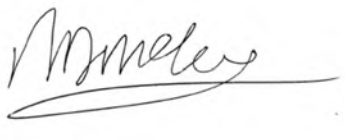
Lapse and review

30. This consent shall lapse on 30 June 2017, 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.

31. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2016 and/or June 2022 and/or 2025, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 15 December 2020

For and on behalf of
Taranaki Regional Council



A D McLay
Director - Resource Management

Appendix II

Company provided annual report

29 July 2024

Chief Executive
Taranaki Regional Council
Private Bag 713
47 Cloten Road
Stratford
Attention: Chania Hattle

Dear Chania

RE: Resource Consent 7795-1.1 - Manawapou (Symes) - 156 Manawapou Road, RD 2, Patea

As required under special condition 9 of resource consent 7795-1.1, please find all relevant information recorded from the operational period 1 July 2023 to 30 June 2024 relating to receipt and landspreading activities undertaken at Waste Remediation Services (WRS) Manawapou remediation site. It is the tenth report completed by WRS following the previous periods;

2014-15
2015-16
2016-17
2017-18
2018-19
2019-20
2020-21
2021-22
2022-23

This report is designed to follow on from the previously submitted 2022-23 consent monitoring report is focused on activities, records and results from the 2023-24 period. This report is structured into seven sections, as follows:

1. Overview and Background
2. Material Received for Remediation
3. Remediation – comprising preparatory earthworks, landspreading and incorporation and

Rehabilitation Operations - comprising topsoil application, sowing, additional works
4. Monitoring
5. Additional Consent Requirements
6. Summary

1. OVERVIEW AND BACKGROUND

WRS began operating the Manawapou remediation site in 2014, replacing the original site operators Remediation NZ Ltd, who were issued resource consent 7795-1 in 2012. The consent was varied in late 2020 to enable the receipt of sediment retention pond water from Water Treatment Plants (WTPs) from 15 Dec 2020 under 7795-1.1. Between 2014 and the current reporting year, there have been intermittent periods of activity at the site, reflecting fluctuating levels of activity within the local drilling industry.

During 2023-24 there has been a low level of activity at the Manawapou site. The site has received small quantities of drilling/production material for remediation from Todd Energy, Beach Energy, OMV/InterGroup, NZEC, Halliburton and Nova Energy. Preparation of a new spreading area in Stage 11, viz Stage11/ Phase 3 seaward and south of site (M2110) was undertaken; the continuum of receipt, spreading and remediation at the conclusion of the 2022 monitoring year continued into the 2023 - 24 year and similarly will continue into the 2024-25 monitoring year.

Monitoring of the site undertaken in the 2023-24 year by both the Taranaki Regional Council (TRC) and WRS management has shown the operations undertaken at Manawapou to be compliant with consent conditions; no incidents resulting in deleterious outcomes were recorded against the site in 2023-24.

2. WASTES RECEIVED FOR DISPOSAL

Waste Types and Volumes
During the 2021-22 year, a total of 5,078 m^3 of both solid and liquid wastes were received onsite from the following sources:

- Todd Energy wells Kapuni J KA-28, Kapuni J KA-27, Kapuni J KA-25, Kapuni J KA-06, Kapuni Production Station (KPS), Mangahewa D Skimmer Pit, Mangahewa/MMPS Stream, Todd KGTP and Sawdust
- Halliburton's Liquid Mud Plant supplying Todd Energy drilling and Symons Mud Tube wash site
- OMV/Intergroup Wells MB-04 and MB-08, and Pohokura POW-05
- Beach Energy's Kupe Production Station MEG
- Nova Energy's WTP at McKee
- NZEC Waihapa

Further details of quantities of material, dates and volumes are provided in the updated mud register attached as Appendix A. – Mud Register 2023-24

Remediation Materials Characterisation

Consent 7795-1.1 requires the site operator to sample and keep records of the chemical composition of materials received for remediation. Composite samples are taken (generally by wellsite staff prior to transport) across each material stream before materials leave the well/source site for delivery. In the past when the receipt and recovery and spreading of liquids and cuttings from the storage pits was campaigned, WRS took samples from the pits prior to landspreading for additional waste characterisation. Now with the substantial increase in drilling to meet the increased demand for gas, the pits are now merely transfer points from road trucks to agricultural machinery, with the receipt and spreading occurring simultaneously. For this reason, pre-spreading sampling no longer provides further information that might be expected from storage of material in the pits for long periods of time. All samples are sent to Hill Labs for analysis. Results are forwarded directly to the TRC for their records and for cross- referencing purposes. Results are kept and logged by WRS and are used to calculate required spreading areas as per condition 12 of consent 7795-1.1, to ensure the hydrocarbon limit in condition 14 is adhered to. As TRC have been directly provided all results simultaneously with WRS, in the interest of avoiding duplication, PDF copies will not be attached to this report.

3. REMEDIATION AND REHABILITATION OPERATIONS

During the 2023-24 operational period spreading operations commenced in a new 5.4ha area (Phase 3) in Stage 11 of the Manawapou site (as identified on the updated site map, Appendix B). Spreading in this area was still underway at the end of the 2024 operational period.

A recent photographs of the current spreading area Phase 3 and the completed area M2110 at the Manawapou site are attached as Appendix C.

4. MONITORING

Site Inspections - WRS

WRS closely supervise site operations, receipt of materials for remediation, spreading and rehabilitation to ensure all contractors are following best practice as per the site operation management plan and conditions specified in consent 7795-1.1 Regular site inspections by WRS management are also undertaken during periods of inactivity at the site. The agricultural contractor used at Manawapou has been engaged continuously from 2014 and has considerable experience and knowledge of working in coastal sand environments and with the principal's consent, management standards and practices. The methods undertaken are well established and efficacious.

Site Inspections – TRC

WRS received two site inspections from the TRC for the 2023-24 year; both were programmed. Notices recorded that the TRC inspector was satisfied with the physical state of the site, and with operations being undertaken around the time of inspection. Copies of the TRC inspection notices are attached as Appendix D.

Receiving Environment Sampling

WRS has received from the TRC and presented the composite soil sampling and groundwater results in Appendix E and F; sampling is undertaken exclusively by TRC staff, with all samples being sent to Hill Labs for the full suite of analytes required under consent 7795-1.1 .

Soil monitoring results

For the soil samples taken only from areas M2110/ Phase 1 and Phase 2 of particular importance are surrender criteria values listed in Conditions 26. and 27. pertaining to heavy metals, salts and hydrocarbons (MAH, PAH and TPH). Heavy metals were all below surrender criteria for all samples, 3 of the 6 samples had only slightly elevated levels for sodium (500, 480, 530 mg/kg ; consent limit 460 mg/kg, and TPH levels from 5,000 to 8,800 (C7-C36) mg/kg.

All results for the TRC 2023-24 soil sampling is presented in Appendix E.

Groundwater monitoring results

TRC have completed quarterly groundwater monitoring at the Manawapou as per the agreed monitoring programme and have supplied all results to WRS. Consent 7795-1.1 has two conditions relating to groundwater, conditions 18 and 19. Condition 18 relates specifically to the concentration of total dissolved salts (TDS), which is limited to a maximum concentration of 2500 g/m^3. Condition 19 has a relatively broad requirement around the exercising of the consent not resulting in any other contaminant concentrations above background levels.

Bore GND2303 was severely damaged by hedge trimming operations in 2021 (and left by the contractor unreported) was not able to be sampled during the first half of the 2021-22 monitoring period. Repairs were effected Dec 2022-January 2023 and sampling was to be resumed during the latter half of the 2022-23 reporting period. However deep well damage identified during the restarted programme, prevented representative samples being obtained. Further sampling of this bore has been suspended with decisions re the replacement or relocation of the bore to be determined post the 2024-25 monitoring and reporting year.

WRS have reviewed these supplied results and have not identified any more than minor non-compliances with consent 7795-1.1 conditions. The full range of groundwater results will likely be included in the TRC Annual Report (as has been done in previous years), so these will not be discussed in detail in this report, but are presented in full in Appendix F.

The groundwater results show compliance with the groundwater conditions of consent 7795-1.1. No hydrocarbons have been detected in any of the samples, salinity is very slightly elevated in bore GND2302, more so in GND2301 adjacent to the pit area, but well below the consented TDS limit (2500 g/m^3) given in condition 22 for any fresh water body.

5. ADDITIONAL CONSENT REQUIREMENTS

Operations at the Manawapou remediation site are all undertaken generally in accordance with the

WRS' Landfarm Management Plan (LMP) that covers both the Manawapou and Waikaikai sites. It is a live document and is constantly reviewed and updated as necessary to reflect operational requirements and practices at both sites operated by WRS. The latest iteration of the plan undertaken recently -June 2024 - is available on request.

As per condition 3 of consent 7795-1.1, the site management plan has again been under review at the end of the monitoring period. A further update of the plan will be available in Q4/24.

6. INCIDENT SUMMARY

WRS is not aware of any incidents or outcomes thereof of significance at the site during the 2023-24 monitoring period.

There has been a problem with the state of the G/W bores, the nature of which is only becoming known slowly as a result of the TRC's annual sampling and WRS's general investigation into the general area's geohydrology. Work was undertaken to airlift and clean out the bores at Manawapou in Feb 2024 enabling re-definition of true total depth and groundwater levels in all the bores to assist with greater resolution of the piezometric gradient of the area. This work was initially constrained by availability of a suitable contractor and staff availability, but has now been completed. Most bores (with the exception of GND 2303) well total depth was sounded and sediment airlifted from the bore. What was notable was the very slow recovery of the standing water level with this not stabilising with 4 hrs plus in all wells. Further work is being considered to try and establish the true piezometric gradient of the consented area, but no decision has yet been made to when this will happen

7. SUMMARY

During 2023-24 there has been a reasonably high amount of activity at the Manawapou site in the latter half of calender year 2023 only. With the suspension of drilling by Todd in late 2023 there was a significant reduction in material to be remediated. The site has received drilling/production waste remediation materials from principally Todd Energy, Beach Energy, and OMV. Use of a new spreading area Stage 11/Phase 3 was completed in late 2022 , and spreading and incorporation of material continues at the conclusion of the monitoring period. Monitoring results from TRC sampling have indicated that no significant adverse consequences have occurred from the exercise of consent 7795-1.1 during the monitoring period under review. With repairs to Pit 2 long overdue due to not being able to locate a sufficiently willing repair company, the job was finally completed in June 2024. With this work completed the site now has all 4 pits available for use.

As of 30 June 2024 no significant environmental consequences have been identified relating to the tears in Pit 2 as the pit water level was maintained well below the tears during the reporting period and no material for remediation – liquid or solid was discharged into the pit during the monitoring year.

8. COMMENT

As similarly noted in the company's Waikaikai report, WRS is regularly being asked by the major oil and gas operators in the region what is the expected life of both WRS's landfarms. This is a conundrum dependent upon national and local political decisions, the volume and rate of drilling waste produced and the implications of the Waste Minimisation Act (WMA) 2008 registration and reporting

requirements which are being modified from time to time. WRS conceded to registration with MfE as an Industrial Mono Fill in Q1/2023 and has complied with all reporting requirements through MfE's OnLine Waste Levy System (OWLS), however WRS remains resolute that our remediation sites are not land fills either in practice or by definition.

As stated in the previous years annual report the countdown of remaining acreage for land farming in the region is continues; once this is exhausted, the operational areas - turnarounds and storage pits- will be returned to functional farmable paddocks by removing the pits, recontouring the ground and spreading the last of the material received for remediation. At this point the efforts undertaken by the consent holder to construct and maintain the impermeability of the storage pits, (now transfer points), will have immediately become a futile exercise in respect of avoiding discharge to ground, the cost of this, and the efforts by all during the entire operational life of the land farm.

It should also be noted WRS's Manawapou remediation operation alone has prevented 5,078 m^3 (and together with Waikaikai's 5,238 m^3 a grand total of 10,316m^3 (approx. 15,474 tonnes) of incompressible liquids and solids going to land fill at facilities several hundred kilometers outside of the region where the material was produced, that is Taranaki's Oil and Gas fields.

WRS would welcome constructive comment on this aspect of the consent holders' views and the sector's future options for disposal of oilfield wastes by well managed remediation activities that are undertaken in compliance with TRC directives and consents and with positive outcomes for the oil and gas operators, the landowners, and care of the natural environment all of which contributes to the continuing support of livelihoods, and commercial activity both regionally and nationally.

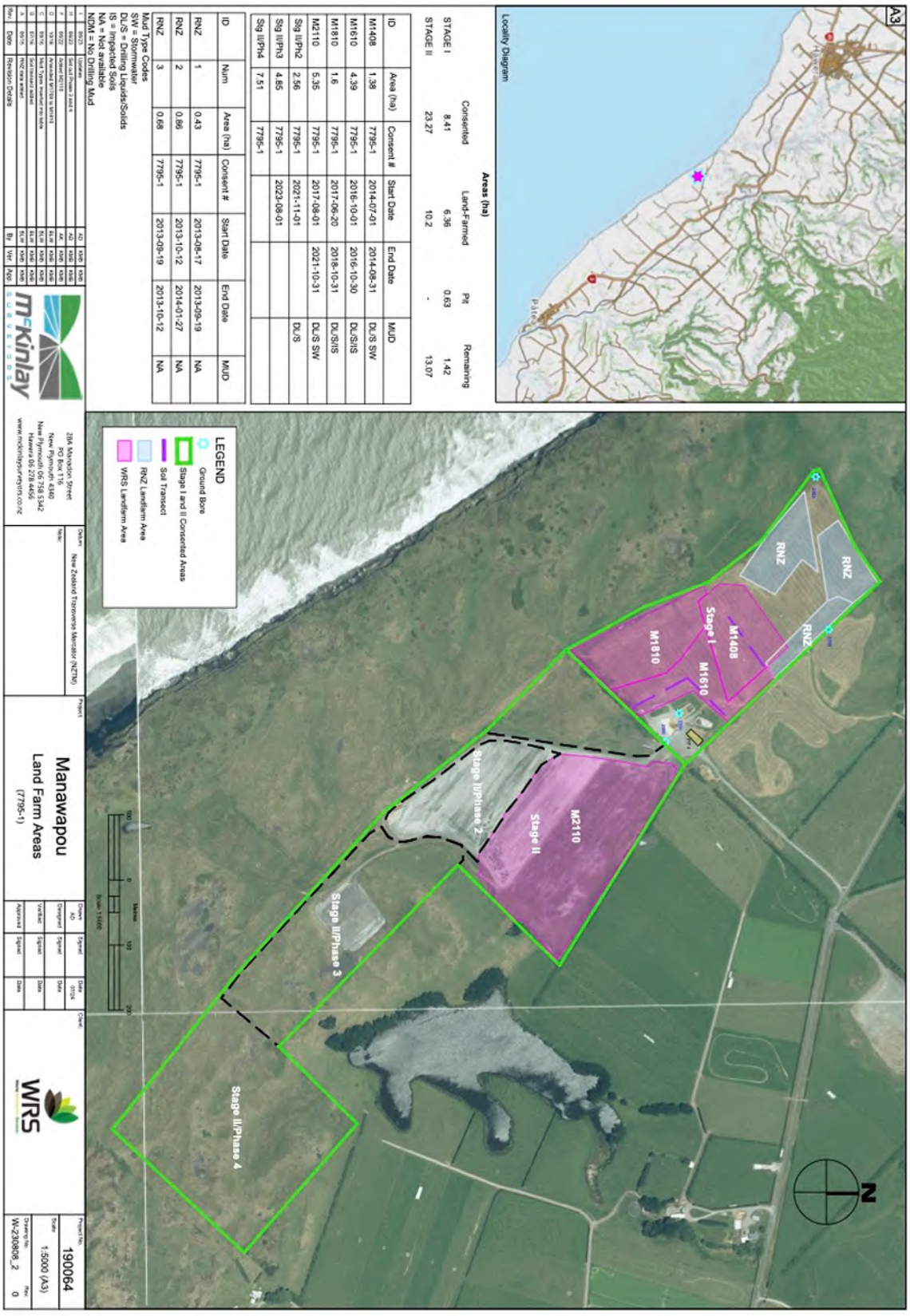
Waste Remediation Services Ltd
w +64 6 751 9221 m + 64 275 996 105 f +64 751 9225
Address 141 – 143 Connett Road East, Bell Block 4312, New Zealand
Post PO Box 7150, New Plymouth 4341, New Zealand
Email: keith@wrsltd.co.nz

Appendix A - Mud Register

Date	Source	Customer	Remediation Site m3			
			Manawapou			
			Solid	Liquid	Direct Spread	Total
Jul-23	Kapuni J KA 28	Todd Energy	129	541	0	670
	Kapuni J KA 28 Total		***129***	***541***	***0***	***670***
Jul-23	Kapuni J KA 27	Todd Energy	441	198	0	639
Aug-23	Kapuni J KA 27	Todd Energy	242	737	0	979
Sept-23	Kapuni J KA 27	Todd Energy	0	123	0	123
Oct-23	Kapuni J KA 27	Todd Energy	36	0	0	36
Dec-23	Kapuni J KA 27	Todd Energy	3	0	0	3
	Kapuni J KA 27 Total		***722***	***1058***	***0***	***1780***
Sept-23	Kapuni J KA 25	Todd Energy	0	2	0	2
	Kapuni J KA 25 Total		***0***	***2***	***0***	***2***
Jul-23	Kapuni Production Station	Todd Energy	0	21	0	21
Sept-23	Kapuni Production Station	Todd Energy	55	0	0	55
	KPS Total		***55***	***21***	***0***	***76***
Jul-23	Intergroup Yard MB 04	OMV	0	10	0	10
	MB 04 Total		***0***	***10***	***0***	***10***
Aug-23	OMV MB 08	OMV	0	192	0	192
	MB 08 Total		***0***	***192***	***0***	***192***
Jul-23	Kupe MEG	Beach	0	19	0	19
Aug-23	Kupe MEG	Beach	0	121	0	121
Sept-23	Kupe MEG	Beach	0	72	0	72
Oct-23	Kupe MEG	Beach	0	96	0	96
Nov-23	Kupe MEG	Beach	0	15	0	15
Mar-24	Kupe MEG	Beach		96	0	96
Apr-24	Kupe MEG	Beach	0	166	0	166
May-24	Kupe MEG	Beach	0	46	0	46
	Kupe MEG Total		***0***	***631***	***0***	***631***
Aug-23	Halliburton LBMP	Halliburton	0	96	0	96
Sept-23	Halliburton LBMP	Halliburton	0	144	0	144
Oct-23	Halliburton LBMP	Halliburton	0	63	0	63
Nov-23	Halliburton LBMP	Halliburton	0	164	0	164
Dec-23	Halliburton LBMP	Halliburton	0	68	0	68
Jan-24	Halliburton LBMP	Halliburton	0	116	0	116
Feb-24	Halliburton LBMP	Halliburton	0	106	0	106
	Halliburton LBMP Total		***0***	***757***	***0***	***757***
Aug-23	MHW D Skimmer Pit	Todd Energy	24	0	0	24
	MHW D Skimmer Pit Total		***24***	***0***	***0***	***24***
Aug-23	Nova WTP	Nova	0	360	0	360
	Nova WTP Total		***0***	***360***	***0***	***360***
Nov-23	Kapuni J KA06	Todd	173	0	0	173
	Kapuni J KA06 Total		***173***	***0***	***0***	***173***

Feb-24	NZEC Waihapa	NZEC	0	82	0	82
Mar-24	NZEC Waihapa	NZEC	0	39	0	39
	NZEC Waihapa Total		***0***	***121***	***0***	***121***
Apr-24	Todd MHW/MMPS Stream	Todd	0	30	0	30
	Todd MHW/MMPS Stream Total		***0***	***30***	***0***	***30***
Apr-24	Todd KGTP	Todd	0	17	0	17
	Todd MHW/MMPS Stream Total		***0***	***17***	***0***	***17***
Apr-24	Todd Sawdust	Todd Energy	90	0	0	90
	Todd Energy Total		***90***	***0***	***0***	***90***
May-24	Symons Yard	Symons	0	38	0	38
	Symons Yard Total		***0***	***38***	***0***	***38***
Jun-24	Pohokura POW-05	OMV	36	71	0	107
	Pohokura POW-05 Total		***36***	***71***	***0***	***107***
ANNUAL TOTAL TO 30 JUNE 2024 (m3)			**1,229**	**3,849**	**-**	**5,078**

Appendix B - Manawapou Site Map



Appendix C - Field Photographs

Photograph 1 – Discharge of cuttings and sawdust into Pit 1

Photograph 2 -Mud drying in spread area Stage 2/Phase 3

Photograph 3 –Spreading liquids Stage2/Phase3

Photograph 4 -Recovering topsoil from Stage2/Phase 3 boundary bund

Photograph 5 – Construction of stormwater sump Stage2/Phase3

Photograph 6- Backfilling stormwater sump in sand

Photograph 7 – Spreading and levelling topsoil Stage2/Phase 3

Photograph 8- Airlifting groundwater bores

Photograph 9- Cleaning out Pit 1 with long reach digger

Appendix D - TRC Inspection Notices

Private Bag 713 | 47 Cloten Road | Stratford 4352 | New Zealand | T: 06 765 7127 | F: 06 765 5097 | www.trc.govt.nz

Taranaki Regional Council

Inspection Notice

Under section 332 of the Resource Management Act 1991

Consent Number:	R2/7795-1.1
Consent Name:	Waste Remediation | Land Discharge | Manawapou Rd |change
Contact Name:	Waste Remediation Services Limited
Postal Address:	PO Box 7150, New Plymouth 4341
Site Location Address:	156 Manawapou Road, Manutahi
Inspection Number:	OBS-2024-120705
Inspection Type:	Compliance Monitoring Insp.
Inspection Date:	30 Jan 2024
Inspection Time:	12:30
Weather Details:	Rainfall: Wind Direction: Wind Strength:
Samples Taken:	No
Consent Purpose:	To discharge: • drilling wastes (consisting of drilling cuttings and drilling fluids from water based muds and synthetic based muds), from hydrocarbon exploration and production activities; and • sediment retention pond sludge from water treatment plants onto and into land via landfarming
Conditions Assessed:	0
Overall Compliance Status:	
Inspection Comments:	Inspection 1/2. Inspection undertaken to assess compliance with Resource Consent conditions. Pit 2 remains decommissioned, however it did contain green water below the rip. All other pits operational. Pit 1 was full. Pit 3 approximately half-full and pit 4 has a mix of some liquid and sediment. Good pasture on the land farmed area. Land spreading activities are still being undertaken on the seaward side of this area but were not occurring on the day of the inspection. A pit that had previously been constructed at the lower point of this site now has a ditch which surrounds the pit on the land spreading side, this had some rainwater at the one end of the ditch. This drain has been dug down to black sand in order to assist infiltration and for stopping runoff from the site during the non-active period. No issues to note today. Compliant at the time of inspection.
Further Actions Advice:	
Signed:	
Council Officer:	Chania Hattle
Officer Warrant Number:	494

Disclaimer: The compliance rating reflects the warranted Officer/s observations at the time of inspection and does not provide a comprehensive assessment of compliance with the consent. Therefore the compliance rating is limited to the exact period during which the inspection was undertaken as well as the specific aspects that were inspected.

Private Bag 713 | 47 Cloten Road | Stratford 4352 | New Zealand | T: 06 765 7127 | F: 06 765 5097 | www.trc.govt.nz

Taranaki Regional Council

Inspection Notice

Under section 332 of the Resource Management Act 1991

Consent Number:	R2/7795-1.1
Consent Name:	Waste Remediation | Land Discharge | Manawapou Rd |change
Contact Name:	Waste Remediation Services Limited
Postal Address:	PO Box 7150, New Plymouth 4341
Site Location Address:	156 Manawapou Road, Manutahi
Inspection Number:	OBS-2024-123679
Inspection Type:	Compliance Monitoring Insp.
Inspection Date:	09 May 2024
Inspection Time:	12:00
Weather Details:	Rainfall: Wind Direction: Wind Strength:
Consent Purpose:	To discharge: • drilling wastes (consisting of drilling cuttings and drilling fluids from water based muds and synthetic based muds), from hydrocarbon exploration and production activities; and • sediment retention pond sludge from water treatment plants onto and into land via landfarming
Conditions Assessed:	0
Overall Compliance Status:	Compliance
Inspection Comments:	Inspection 2/2. Inspection undertaken to assess compliance with consent conditions. Pit 2 remains decommissioned, with rainwater currently below the rip. All other pits operational. Pit 1 had a mix of solids and liquids and was fairly full. There was a pile of sawdust stockpiled at the one end of Pit 1 which will be used to mix in with some of the slurry to enable materials handling prior to cleaning out Pit 1. Pit 3 is not currently in operation, although it had some recent rain water sitting within it. Pit 4 was fairly full of liquid. There was good pasture cover of Stage II/phase 1. There was some damage to the grass on the edges of Stage II/phase 2 from trucks, but this is an access route and is not part of the landfarmed area. The spreading area was fairly wet due to the recent rain, and there were no operations at the time of the inspection. No other issues to note. Compliant at the time of inspection.
Further Actions Advice:	
Signed:	
Council Officer:	Chania Hattle
Officer Warrant Number:	494

Disclaimer: The compliance rating reflects the warranted Officer/s observations at the time of inspection and does not provide a comprehensive assessment of compliance with the consent. Therefore the compliance rating is limited to the exact period during which the inspection was undertaken as well as the specific aspects that were inspected.

Appendix E - Soil Monitoring Results

Hill Labs Soil sample results, Manawapou Site 2023-24

Parameter	Consent Limit	Area	M2110/Phase 1			M2110/Phase 2		
		Name	M01	M02	M03	M04	M05	M06
		Sample No	3599913.1	3599913.2	3599913.3	3599913.4	3599913.5	3599913.6
		Date	5/6/24	5/6/24	5/6/24	5/6/24	5/6/24	5/6/24
Individual Tests								
Dry Matter	NS	g/100g as rcvd	89	88	87	86	88	89
Soluble Salts	2.5	g/100g dry wt	0.11	0.14	0.08	0.18	0.21	0.14
Electrical Conductivity (EC)	2.9	mS/cm	0.3	0.4	0.2	0.5	0.6	0.4
Total Recoverable Barium	NS	mg/kg dry wt	5,200	4,300	5,200	2,900	4,900	4,000
Total Recoverable Calcium	NS	mg/kg dry wt	10,100	10,100	9,600	10,100	17,100	11,200
Total Recoverable Magnesium	NS	mg/kg dry wt	3,100	3,100	3,500	3,000	4,100	3,400
Total Recoverable Potassium	NS	mg/kg dry wt	1,110	1,070	830	1,080	1,480	1,020
Total Recoverable Sodium	460	mg/kg dry wt	430	450	500	480	530	440
Chloride	700	mg/kg dry wt	230	320	148	390	450	175
pH	NS	pH Units	8.1	8.1	8.1	7.7	8.9	8.8
Heavy Metals with Mercury, Screen Level								
Total Recoverable Arsenic	20	mg/kg dry wt	6	3	4	3	3	2
Total Recoverable Cadmium	1	mg/kg dry wt	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total Recoverable Chromium	600	mg/kg dry wt	30	27	24	24	35	28
Total Recoverable Copper	100	mg/kg dry wt	20	18	18	17	19	15
Total Recoverable Lead	300	mg/kg dry wt	7.4	5.1	4.8	5.0	6.5	5.2
Total Recoverable Mercury	1	mg/kg dry wt	0.48	<0.10	<0.10	<0.10	<0.10	<0.10
Total Recoverable Nickel	60	mg/kg dry wt	12	12	11	12	17	13
Total Recoverable Zinc	300	mg/kg dry wt	94	90	88	81	112	94
BTEX in Water by Headspace GC-MS								
Benzene	NS	mg/kg dry wt	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Toluene	NS	mg/kg dry wt	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	NS	mg/kg dry wt	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
m&p-Xylene	NS	mg/kg dry wt	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
o-Xylene	NS	mg/kg dry wt	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Total Petroleum Hydrocarbons in Water								
C7 – C9	NS	mg/kg dry wt	<20	<20	<20	<20	<20	<20
C10 – C14	NS	mg/kg dry wt	610	660	800	1,100	930	680
C15 – C36	NS	mg/kg dry wt	4,400	4,800	4,600	7,700	6,800	6,100
Total Hydrocarbons (c7-C36)	NS	mg/kg dry wt	5,000	5,500	5,400	8,800	7,800	6,800
		Lab Number	3600582.1	3600582.2	3600582.3	3600582.4	3600582.5	3600582.6
Calcium (Sat Paste)	NS	mg/L	312	387	233	400	479	291
Magnesium (Sat Paste)	NS	mg/L	45	55	32	64	90	51
Sodium (Sat Paste)	NS	mg/L	152	172	142	272	477	326
Sodium Absorption Ratio	NS	$(mmol/L)^{0.5}$	2.1	2.2	2.3	3.3	5.2	4.6

** NS – Not Specified*

Parameter	Consent Limit	Area	M2110/Phase 2
		Name	**M07**
		Sample No	3599913.7
		Date	5/6/24
Individual Tests			
Dry Matter	NS	g/100g as rcvd	88
Soluble Salts	2.5	g/100g dry wt	0.16
Electrical Conductivity (EC)	2.9	mS/cm	0.5
Total Recoverable Barium	NS	mg/kg dry wt	5,600
Total Recoverable Calcium	NS	mg/kg dry wt	14,100
Total Recoverable Magnesium	NS	mg/kg dry wt	3.900
Total Recoverable Potassium	NS	mg/kg dry wt	1,420
Total Recoverable Sodium	460	mg/kg dry wt	500
Chloride	700	mg/kg dry wt	260
pH	NS	pH Units	8.8
Heavy Metals with Mercury, Screen Level			
Total Recoverable Arsenic	20	mg/kg dry wt	3
Total Recoverable Cadmium	1	mg/kg dry wt	<0.10
Total Recoverable Chromium	600	mg/kg dry wt	29
Total Recoverable Copper	100	mg/kg dry wt	17
Total Recoverable Lead	300	mg/kg dry wt	7.2
Total Recoverable Mercury	1	mg/kg dry wt	0.27
Total Recoverable Nickel	60	mg/kg dry wt	15
Total Recoverable Zinc	300	mg/kg dry wt	100
BTEX in Water by Headspace GC-MS			
Benzene	NS	mg/kg dry wt	<0.05
Toluene	NS	mg/kg dry wt	<0.05
Ethylbenzene	NS	mg/kg dry wt	<0.05
m&p-Xylene	NS	mg/kg dry wt	<0.10
o-Xylene	NS	mg/kg dry wt	<0.05
Total Petroleum Hydrocarbons in Water			
C7 – C9	NS	mg/kg dry wt	<20
C10 – C14	NS	mg/kg dry wt	820
C15 – C36	NS	mg/kg dry wt	7,200
Total Hydrocarbons (c7-C36)	NS	mg/kg dry wt	8,000
		Lab Number	3600582.7
Calcium (Sat Paste)	NS	mg/L	365
Magnesium (Sat Paste)	NS	mg/L	67
Sodium (Sat Paste)	NS	mg/L	292
Sodium Absorption Ratio	NS	$(mmol/L)^{0.5}$	3.7

** NS – Not Specified*

Appendix F - Groundwater Results

Hill Labs Groundwater results, Manawapou Site, all monitoring bores 2023-24

Parameter	Consent Limit	BORE	GND2300		GND2302		Lake Taumaha
		Date	31/1/24	5/6/24	31/1/24	5/6/24	5/6/24
		Sample No	3456262.1	3599931.1	3456262.2	3599931.2	3599938.1
Individual Tests							
pH	NS	pH Units	6.4	6.4	6.5	6.7	8.1
Electrical Conductivity (EC)	NS	mS/m	126.5	156.6	67.2	65.1	45.3
Electrical Conductivity (EC)	NS	µS/cm	1,265	1,566	672	651	-
Total Dissolved Solids (TDS)	2,500	g/m³	750	970	410	420	280
Dissolved Barium	NS	g/m³	0.047	0.056	0.026	0.022	-
Acid Soluble Barium	NS	g/m³	<0.11	<0.11	<0.11	<0.11	<0.11
Total Sodium	NS	g/m³	125	136	58	58	44
Chloride	NS	g/m³	260	380	106	99	77
BTEX in Water by Headspace GC-MS							
Benzene	NS	g/m³	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Toluene	NS	g/m³	0.0013	0.0066	<0.0010	<0.0010	<0.0010
Ethylbenzene	NS	g/m³	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
m&p-Xylene	NS	g/m³	<0.002	<0.002	<0.002	<0.002	<0.002
o-Xylene	NS	g/m³	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Petroleum Hydrocarbons in Water							
C7 – C9	NS	g/m³	<0.10	<0.10	<0.10	<0.10	<0.10
C10 – C14	NS	g/m³	<0.2	<0.2	<0.2	<0.2	<0.2
C15 – C36	NS	g/m³	<0.4	<0.4	<0.4	<0.4	<0.4
Total Hydrocarbons (c7-C36)	NS	g/m³	<0.7	<0.7	<0.7	<0.7	<0.7

** NS - Not Specified*

……..END

Appendix III

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.