

TOITŪ TE WHENUA

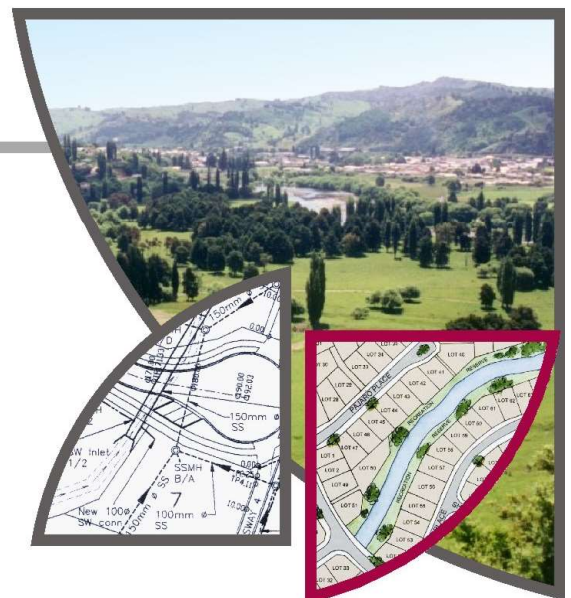
LAND INFORMATION NEW ZEALAND



Fraser Thomas

ENGINEERS • RESOURCE MANAGERS • SURVEYORS

146 TE MAWHAI ROAD, TE
AWAMUTU




FORMER TOKANUI PSYCHIATRIC HOSPITAL
CLOSED LANDFILL
AFTERCARE AND MONITORING PLAN

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TOITŪ TE WHENUA – LAND INFORMATION NEW ZEALAND
FORMER TOKANUI PSYCHIATRIC HOSPITAL DEMOLITION AND REMEDIATION

TOKANUI CLOSED LANDFILL AFTERCARE AND MONITORING PLAN

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1.0 INTRODUCTION

This Aftercare and Monitoring Plan (AMP) has been prepared to address site aftercare and monitoring requirements for the closed landfill located at the Former Tokanui Psychiatric Hospital (FTPH, the Site). The FTPH is subject to a Treaty Settlement with Ngāti Maniapoto and LINZ is the Government agency responsible for managing the closed landfill under Schedule 9: Tokanui Hospital Deferred Selection Process of the Ngāti Maniapoto Deed of Settlement (the Deed) Schedule: Property Redress.

The closed landfill is defined as 'existing disposal sites' (clause 9.1.12) and henceforth referred to as the Tokanui Closed Landfill, following completion of repair and upgrade activities at the existing disposal sites.

Please note the change in name in this, or future reports generated in relation to the Tokanui Closed Landfill, do not override the terms of the Deed. Full details and description of the project and works to which this AMP relates are provided in the Existing Disposal Site Repair and Upgrade Works report, dated November 2024.

2.0 BACKGROUND INFORMATION

The former Tokanui Psychiatric Hospital is approximately 80ha in area, with 76 buildings, a wastewater treatment plant, swimming pool, eight substations, substantial roading and inground infrastructure and services. While operational, the hospital also had its own landfill comprising two separate areas located off Farm Road (private road), directly east of the Wharekōrino Stream within the Site boundary. The existing disposal sites were closed in 2000 and were consented under the consents numbered 102269.01.01, 102270.01.01 and 102271.01.01.

Under the Deed, LINZ (on behalf of the Crown) was required to undertake demolition and remedial works on the main hospital complex but is not required to carry out remedial works on the existing disposal sites (Clause 9.13.1(a)). LINZ is, however, required to maintain valid land use resource consents for the monitoring of the existing disposal site in perpetuity and is tasked with the ongoing management and monitoring of the existing disposal sites on behalf of the Crown (Clause 9.13.1(b) and 9.25).

As part of this responsibility, an intrusive investigation of the landfill by Fraser Thomas Ltd (FTL) (FTL, 2024a) confirmed the landfill extent, depth and contents; a subsequent full analysis of options to inform a long-term management strategy was also undertaken by FTL and provided as the Existing Disposal Site Repair and Upgrade Works report (FTL, 2024b). This assessment included assessment of various repair and upgrade options on the existing disposal sites to ensure that human health, social and cultural values and the environment are protected from closed landfill hazards, to ensure responsible long-term taxpayer value for money, and to reduce the Crown's long-term liability. As

part of this assessment, it was determined that Option 4 was the preferred option for implementation

As noted above, full information regarding the Crown's requirements under the Deed as well as the full analysis of options to inform a long-term management strategy is provided in the Existing Disposal Site Repair and Upgrade Works report (FTL, 2024b).

As part of the demolition and remediation of the FTPH, works have also been undertaken on the existing disposal sites, comprising the following:

- (a) Improved capping of the entire landfill.
- (b) Transfer of low- and moderate-contaminated soil, as defined in the Site Specific Risk Assessment (HAIL Environmental, 2024) from hospital remedial works into Area E/F and isolated medical waste removal, with excavated material from this area being used as backfill in the demolition works.
- (c) Shifting of fill/refuse material from Area H and part of Area A2 into Area A1, plus stream reinstatement, with a new embankment on the eastern side to separate the reclaimed area from the residual A2 area.
- (d) Maintaining the existing southern farm track crossing embankment and raising this slightly to assist with flood mitigation; capping and sealing an existing culvert (Culvert 3) and replacing this with a new shorter culvert aligned further west of the Culvert 3 and tying into the reinstated stream.

Following these works, the landfill comprises the areas shown in Table 1 below and illustrated in Figure 1.

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Table 1: Existing Landfill Site - Areas/Volumes and Topsoil/Cap/Fill Characteristics Post Repair and Upgrade Works

Item	Area				
	A1+A2	B	C	D	E+F
Area (m ²)	XXX	2,790	1,180	2,440	XXX
Fill Volume (m ³)	XXX	3,420	1,350	3,870	XXX
Estimated Date for End of Filling	1988	1979	1997	~1979	2024
Topsoil – minimum (mm)	150	150	150	150	150
Landfill Cap (mm)	300mm agricultural cover; 150mm protective layer overlying GCL; underlain by 150mm protective layer				
Cap permeability (m/s)	<10 ⁻⁷				
Fill Description (main content)	Construction & general waste, burnt material, inferred boiler ash, asbestos	Construction/demolition waste, some burnt debris, asbestos	General & construction waste, asbestos	Construction waste, including wood, metal, concrete and bricks, asbestos	Low and moderate level contaminated soil from hospital demolition works

Note: Estimated areas and volumes have ±10-30% accuracy, with the higher 30% range allowing for the method and nature of filling in Area A. XXX – to be confirmed post-works

3.0 RESOURCE CONSENTS

As part of the repair and upgrade works referred to, the existing resource consents, referred to as existing disposal consents (Clause 9.1.12) in the Deed, for the Tokanui Closed Landfill were replaced in 2024/2025.

The current Waikato Regional Council (WRC) consents are listed below:

- XXX – Discharge of leachate into land in circumstances that may result in contaminants entering groundwater
- XXX – Divert and discharge stormwater into the Wharekōrino Stream
- XXX – Discharge of contaminants to air
- XXX – Earthworks within 5m of the Wharekōrino Stream

These consents were granted in XXX and expire in XXX.

The current Waipa District Council (WDC) consents are listed below:

- XXX – Earthworks in excess of 1,000m³ total volume
- XXX – Landfill activity
- XXX – Earthworks within 20m of a cultural site
- XXX – Earthworks within 23m of the edge of the Wharekōrino Stream.

These consents were granted in XXX and expire in XXX.

Copies of these consents are included in Appendix A.

4.0 AFTERCARE AND MONITORING PLAN

This AMP sets out ongoing aftercare and monitoring requirements for the closed landfill in accordance with the above resource consents. This includes appropriate mitigation and contingency measures to follow in the event of non-compliance with consent conditions. A copy of this AMP has also been provided to Te Nehenehenui Trust as per the requirements of the Deed.

4.1 Responsibilities

LINZ is the Government agency responsible for aftercare and monitoring of the closed landfill in perpetuity on behalf of the Crown. They have currently engaged FTL to undertake monitoring of the closed landfill under a five-year contract. Relevant contact details are listed below. These contact details will be updated, when required.

Organisation	Contact Person
LINZ	Kim Wepasnick, Principal Advisor – Contaminated Land 04 498 3820 kwepasnick@linz.govt.nz
Fraser Thomas Ltd	Dr Sean Finnigan, Senior Environmental Engineer 09 278 7078 sfinnigan@ftl.co.nz

4.2 Final Contours

Final contours of the closed landfill are shown on drawings 33097/XX.

4.3 Ongoing Monitoring Requirements

The Tokanui Closed Landfill resource consent (XXX) includes several monitoring conditions that must be met each year. These conditions involve ongoing monitoring of the groundwater and surface water and visual inspections of the landfill areas by Suitably Qualified and Experienced Practitioners (SQEPs) as set out in the following sections of this plan.

4.4 Groundwater and Surface Water Monitoring

Sampling of groundwater and surface water is required to be undertaken bi-annually during April and September each year, from stream sampling points S1, S2 and S3, and bore monitoring wells P2 & P7 as shown in Figure 1.

Sampling parameters in accordance with Condition XX of resource consent XX are presented in the following table.

Table 1: Surface Water and Groundwater Monitoring Parameters for Tokanui Closed Landfill

Source	Frequency	Locations	Parameters
Wharekōrino Stream Water	Twice a year to coincide with high and low groundwater levels (generally September and April).	S1, S2 and S3 as shown in Figure 1.	<ul style="list-style-type: none"> pH Conductivity Suspended solids Total boron Total iron Potassium Chloride Ammoniacal-nitrogen Nitrate nitrogen Sulphate

Groundwater	Twice a year to coincide with high and low groundwater levels (generally September and April).	Monitoring wells P2 and P7 as shown in Figure 1.	<ul style="list-style-type: none"> • Water level • pH • Conductivity • Alkalinity • Total organic carbon • Dissolved boron • Dissolved iron • Potassium • Chloride • Ammoniacal-nitrogen • Nitrate nitrogen • Sulphate
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Long term sampling and analysis of surface water from the Wharekōrino Stream and groundwater within the Tokanui Closed Landfill site has been ongoing from 2001-present. It is considered that some of the above monitoring parameters could potentially be deleted based on long term monitoring showing no effect of the closed landfill on them. However, as the repair and upgrade works did disturb the landfill areas, it is proposed to monitor all the parameters above for four sampling rounds (two complete years) to check this is still the case, and if confirmed to then seek to remove relevant parameters from the above suite. This would be done as part of the annual report that is submitted each year to WRC.

4.5 Results Analysis and Reporting

These results will be compared with ANZECC freshwater protection guidelines for protection of 95% of species, as has been done in site monitoring to date. Please note, the current consent does not specify relevant guidelines but these are what have been used to date and FTL consider these appropriate.

All results will be added into the long-term monitoring database for the site (excel spreadsheet) and results for each year will be reported on in the annual report.

In addition, monitoring results for each sampling round will be forwarded to WRC within two months of sampling.

4.6 Mitigation and Contingency Measures

If the stream monitoring finds there are adverse water quality effects on the stream based on exceedances of the ANZECC 95% freshwater protection guidelines that can be attributed to the landfill from analysis of the groundwater monitoring results and comparative upstream and downstream surface water samples, then the landfill areas will be investigated to check for any potential sources, such as leachate breakout, cap scour/erosion, etc. If a source is found, then repair works would be undertaken to address the identified issue. If no visible

source is found, then the results and possible additional investigation, monitoring and/or remedial works would be discussed with WRC.

4.7 Maintenance of Landfill Capping and Aftercare

A formal inspection of the surface and capping of the landfill site will be undertaken on an annual basis, as required under consent condition XX, to check for the following:

- I. Poor pasture establishment;
- II. Vegetation die off;
- III. Refuse protruding through the cap;
- IV. Damage to capping materials;
- V. Differential settlement and ponding;
- VI. Subsidence or erosion;
- VII. Leachate springs;
- VIII. Visual surface water quality and
- IX. Erosion at or near the Wharekōrino Stream bank (including the reinstated stream channel completed as part of the landfill repair and upgrade works).

Any defects noticed during these inspections shall be remedied within 10 working days, or a longer period agreed with WRC.

This inspection, including any repair works, shall be reported on, as part of the annual report, to WRC within two months of each inspection.

4.8 Plan Revision

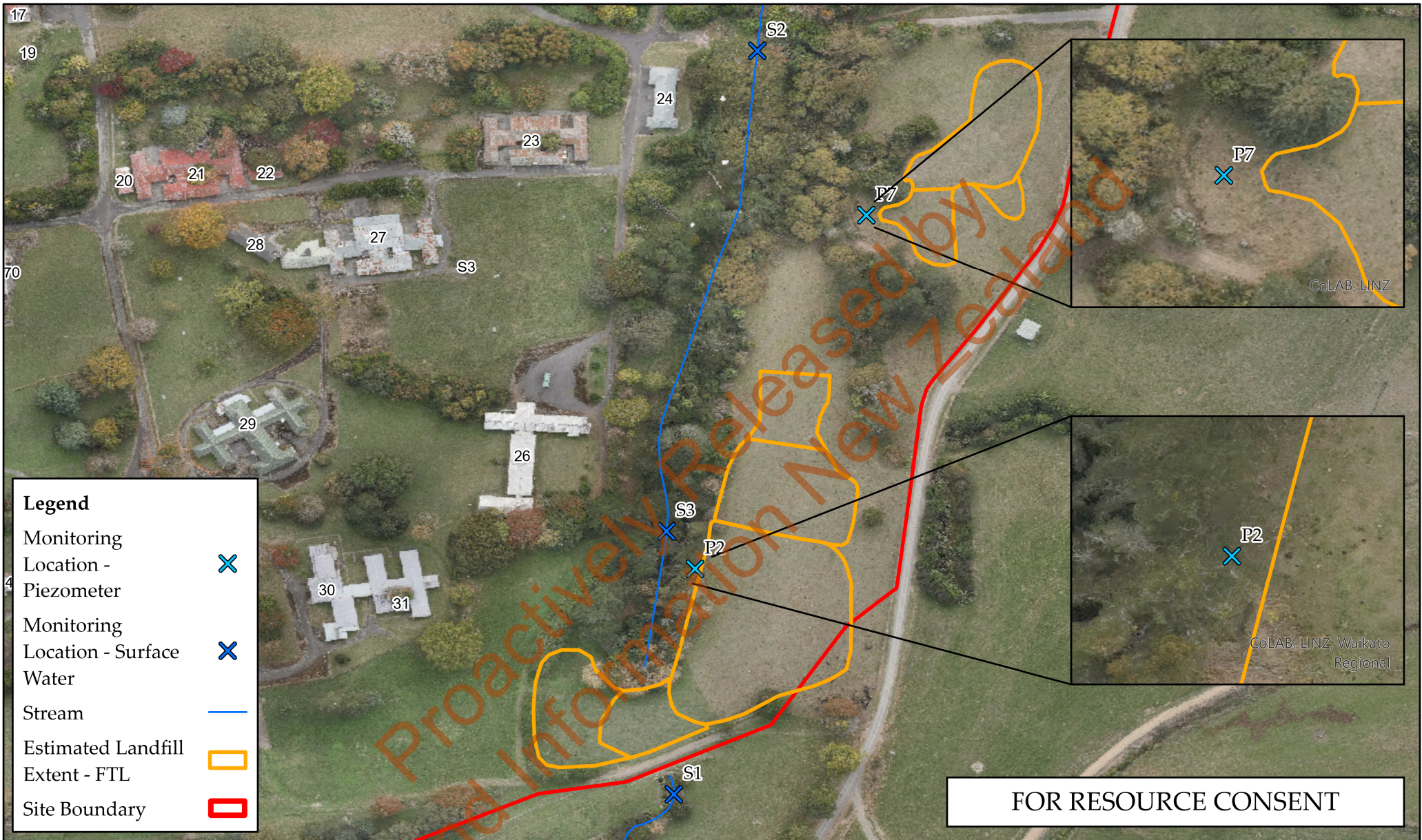
This plan will be reviewed at regular intervals to check it remains fit for purpose. Any changes to this plan will be provided to WRC for approval.

4.9 Planting

A separate Planting and Management Plan has been prepared by SLR Consulting Ltd and is attached to this Aftercare and Monitoring Plan in Appendix B.

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Figures and Drawings



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Appendix A
Resource Consents

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Appendix B

Planting and Management Plan

(to be added post granting of consent)