

1799a Great South Road, Bombay

Effluent Disposal Report



Cam Vernon

Job No: GB27009

6/05/2025

TILSLEY ENGINEERING LTD

CONSULTING ENGINEERS AND ENVIRONMENTAL CONSULTANTS



1799a Great South Road, Bombay

Effluent Disposal Report

Client: Cam Vernon

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Quality Information

Rev	Revision Date	Details	Prepared by		Authorised
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1. INTRODUCTION

1.1 Project Overview

Tilsley Engineering Ltd has been engaged by the client to provide a new effluent disposal system for a total of 30 future staff at 1799a Great South Road, Bombay.

The scope of this report encompasses effluent disposal design in support of future resource and building consent applications to the Council and for interested parties such as the builder, earthworks, and civil contractors.

This report includes a summary of the investigations undertaken and provides an assessment of:

- Ground conditions
- Groundwater conditions
- Environmental assessment and on-site effluent disposal design
- Other constraints and issues identified with the site

2. SITE INFORMATION

2.1 Site description

The property is described legally as Lot 6 DP 156089 and is approximately 8.67ha in area. The site is located on the northeastern side of Great South Road, bordering the Southern Motorway to the east. The Lot is bounded by similar pastureland.

2.2 Proposed site development

This report is in partial response to a request for more information (s92) received by the client, specifying:

28. *The AEE states that there are currently 2-5 staff on site, however, that this number is expected to grow to up to 30 staff in the next 5-10 years. For assessment of the proposed on-site wastewater management, please confirm the following:*

- *The size of the existing wastewater holding tank and frequency of the tank being emptied by a contractor.*
- *Please demonstrate compliance with TP58 chapter 7.8.7 for the maximum site occupancy. TP58 states that the holding tank must provide a minimum of 7 days storage and that the flashing light alarm must be set at a level that provides 2 full days of extra reserve storage, to prevent accidental overflows.*
- *Alternatively, please provide detail and apply for wastewater discharge consent, if necessary, for a future on-site disposal system.*

As such, the proposal is to provide wastewater design recommendations for a holding tank to accommodate 30 day-staff, designed in accordance with TP58.

3. DESKTOP STUDY

TEL have been previously involved in the site. Geotechnical assessment and stormwater management was provided for two new sheds by TEL on 02 February 2024, reference:JP21923-1.



TEL were also engaged to provide earthworks and construction monitoring/inspections for the two sheds. These

In JP21923-1, A total of 8 boreholes (HA01 to HA08) were drilled up to 2.0m – 3.0m depth. Underlying soils consisted of silty clay to clayey silt. Peak shear strengths were greater than 220 kPa. Soils were identified as expansivity class “M”, with characteristic surface movements expected to be $22 < (y_s) \leq 44$ mm.

Each shed is approximately 1125m². Stormwater design for each shed saw roof runoff piped towards a 25,000L water tank, with the overflow towards a 20m level spreader. Each shed is self-contained i.e., has its own stormwater management devices.

TEL undertook a flood assessment (ref: GB 25522, dated: 30/08/2024) to confirm flooding conditions on site.

According to the New Zealand Geotechnical Database (NZGD), accessed December 2024, a 40m deep water bore was drilled on-site by DrillForce, dated 05/12/2012, ref: 29004. Here they encountered volcanic clays up to 4m depth, followed by broken, weathered basalt up to 11.8m depth, before hitting hard basalt rock. Groundwater was encountered at 4.6m depth.

TEL have also undertaken geotechnical, stormwater, and wastewater investigations for a 1400m² dwelling proposed to go on the site (ref: GB26032/3). Here, 4 boreholes were drilled to 1.0m depth. Similar conditions were found as those in JP21923-1.

This report shall be read in conjunction with all previous work by TEL for 1799a Great South Road.

3.1 Published Geology

From the geological map of Auckland (Institute of Geological & Nuclear Sciences Ltd, 1:250,000) in Figure 1, the local geology consists of the undifferentiated Kerikeri Volcanic Group on the northwestern side of the Lot, and mid to late-Pleistocene sedimentary deposits of the Tauranga Group on the southeastern side.

The Undifferentiated Kerikeri Volcanic Group (Qvs) consists of tephra and poorly consolidated ash, lapilli and scoria, intermixed with rhyolitic and andesitic tephra from the Taupo Volcanic Zone. This dates to the early Pleistocene and is up to 1.59 million years old.

The Mid-Pleistocene sedimentary deposits (OIS5+-OIS2) consist of pumiceous sands, silts, muds and clay, interbedded with gravel and peat. This dates to the mid to late Pleistocene and is up to 128,000 years old.

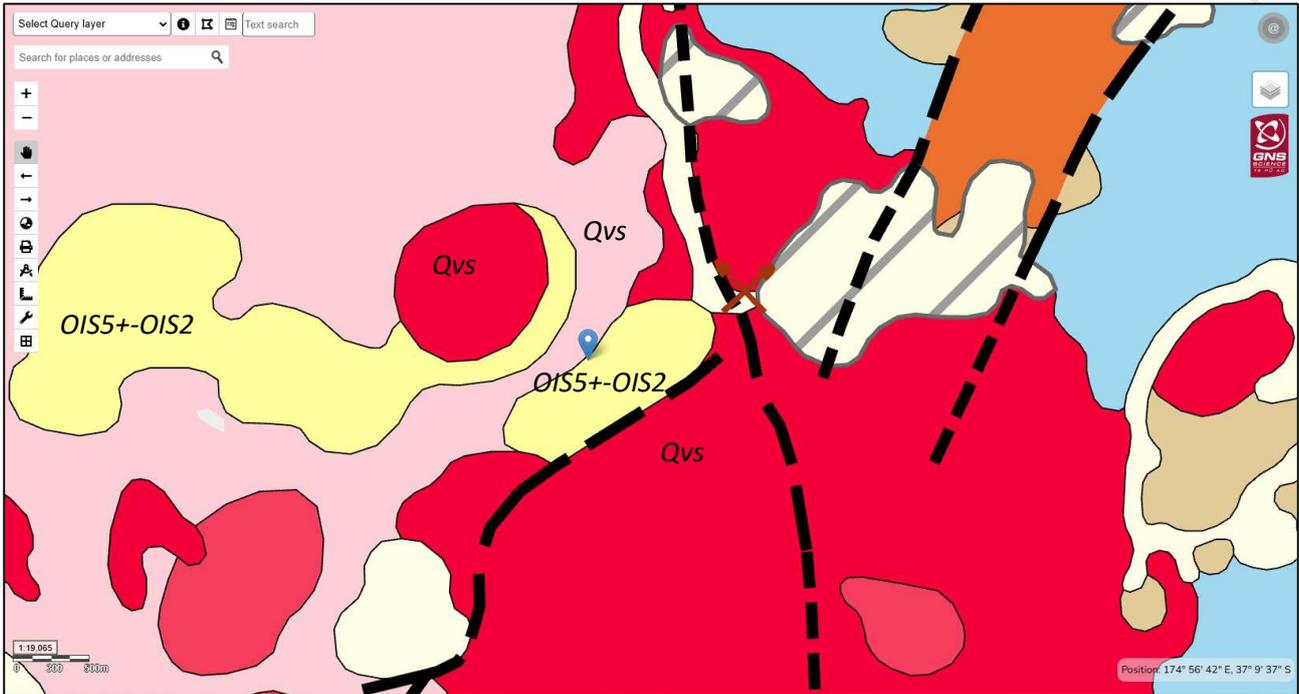


Figure 1 Extract from the published GNS geological map

4. SITE INVESTIGATION

4.1 Field investigation

The site was visited by TEL on 21 February 2025. Investigations for the site were undertaken, which consisted of the following:

- A detailed walkover inspection of the site.
- Hand augering of boreholes HA01-HA04. Please refer to GB26032/3 for details on these.

The locations of all field tests were measured from existing site features and inferred boundaries without survey control and are therefore approximate only. Test locations are shown in the appendices.

Visual-tactile field classification of the soils encountered during drilling was carried out in accordance with “Guidelines for the Field Classification and Description of Soil and Rock for Engineering Purposes”, issued by the New Zealand Geotechnical Society Inc. (2005). Test results are shown in Appendix B.

4.2 Geomorphology

The slope of the site is concave with a gentle slope of 4°. There are no steep slopes within 30m of the proposed development, nor are there any signs of instability. The effluent field is situated more than 20m from the motorway. The northwestern boundary of the Lot features a moderately steep batter (i.e., 14°) up towards the motorway.

4.2.1 Site surface water features

The Council GIS map shows two main overland flow paths flowing towards the northeast and northwest. The northeastern path flows northeast towards an unnamed stream. The northwest flow path flows north into an unnamed stream adjacent to the Southern Motorway. On observation, these

were found to be seasonal and with a very gentle gradient (approximately 1 in 20 to 1 in 25). There is no visible evidence of channelisation or regular surface flow.

There is a flood plain on the neighbouring property approximately 30m to the west of the proposed building platform. The building platform is elevated at least 5m above the flood plain.

Surface water is expected to flow west into the ponding area, before draining towards the north into the unnamed stream.

4.2.2 Flooding

According to council GIS maps, the site occupies a large span flood plain with a flood prone area within a depression. A previous flood assessment was undertaken for the site by TEL, dated 30/08/2024, ref: GB 25522. It was found that there is little to no flood risk associated with the proposed building site. Flood waters are expected to flow north towards the motorway rather than pose a risk to the site. The 1% AEP event is not expected to enter the building if work is carried out to NZ Building Code E1.

4.2.3 Groundwater

Groundwater was not encountered in any of the previous investigations undertaken on site by TEL. As such, groundwater is expected to be at least 3.0m below the surface during wet winter conditions.

4.3 Site services

Site-specific searches are not undertaken for the site utilities and services for the purpose of this report. However, at the time of our site investigation, there was no evidence of any buried services in the vicinity of the proposed building site.

5. ENVIRONMENTAL ASSESSMENT AND WASTEWATER DESIGN

At the moment, wastewater is stored in a 2,000L holding tank, with wastewater being removed from site on a weekly (7-day) basis. As per the S92, the current holding tank is insufficient to accommodate a total of 30 future day-staff.

The following wastewater design outlines the necessary storage volume required to accommodate this change. The enclosed calculation sheet in Appendices is in accordance with TP58.

5.1 Wastewater design

A total of 30 day-staff are expected to use the site. 20 of these are considered to be transient staff and are expected to spend small amounts of time on site. 10 of the staff are consisted of to be permanent.

Water is supplied by both rainwater tanks and water bore. Toilet facilities shall consist of standard, contemporary water reduction fixtures such as dual flush toilet cisterns. As such, a wastewater production of 20L/person/day has been considered for transient staff, while 40L/person/day has been considered for permanent staff. This totals 800L/day of wastewater production.

5.2 Holding Tank Design

The holding tank shall accommodate 20 transient day-staff, and 10 permanent day-staff on-site. In accordance with TP58 chapter 7.8.7, the tank shall have a storage volume for 7 days + 2 days emergency storage. As such, a total capacity of 7,200L is required.

A 2,000L holding tank already exists on site and shall be used in the design. This tank is sufficient to contain the emergency volume (1,600L). A high-water level alarm shall be fitted to this holding tank at the 1,200L level. This holding tank shall be inspected by a suitably qualified professional to assess its operation.

A 6,000L tank shall be added to the site to accommodate the future day-staff. This tank can accommodate the 7 days of storage volume (5,600L). This tank shall be connected in series to the existing holding tank, with the overflow into the 2,000L tank. As the existing tank shall be used for emergency storage, this tank does not require a high-water level alarm.

6. SYSTEM MAINTENANCE

The equipment suppliers will offer training and maintenance support for the system. However, it is the owner's responsibility to carry out all general maintenance procedures for the system to function as designed. We recommend that a maintenance contract be entered into with a recognized wastewater maintenance company. The operation and maintenance forms for the wastewater system is shown in the appendices.

7. RECOMMENDATIONS

- A new, 6,000L holding tank shall be added to the site. This shall overflow into the existing 2,000L holding tank.
- The existing 2,000L holding tank shall be fitted with a high-water level alarm at the 1,200L level.
- The existing holding tank shall be inspected by a suitably qualified professional to assess its operation.



8. LIMITATIONS

This report has been prepared solely for the benefit of our client with respect to a particular brief given to us, and data or opinions in it may not be used in other contexts, by any other party or for any other purposes. To the maximum extent permitted by law, Tilsley Engineering Ltd disclaims all liability and responsibility (in contract or tort, including negligence, or otherwise) for any loss or damage whatsoever which may be suffered as a result of any reliance by any third party on this report, whether that loss is caused by any fault or negligence on the part of Tilsley Engineering Ltd or otherwise.

Council is able to rely on this report for processing the resource or building consent only for the site mentioned within this report. It may not be used for any other use or purpose without permission from Tilsley Engineering Ltd.

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Notice to Reader/ User of this document

Should you be in any doubt as to the applicability of this report and/or its recommendations for the proposed development as described herein, and/or encounter materials on site that differ from those described herein, it is essential that you discuss these issues with the authors before proceeding with any work based on this document.

The recommendations and opinions contained in this report are based upon site observations of the investigation area. Inferences about ground conditions over the site are made using geological principles and engineering judgment, however, it is possible that conditions over the site may vary and therefore it is not possible to guarantee the continuity of ground conditions away from investigation locations and visible areas.

Furthermore, the logs are provided presenting descriptions of the soils and geology based on field observations of the samples recovered in the fieldwork and may not be truly representative of the actual underlying conditions.

Recommendations and opinions in this report are based on data obtained from the investigations and site observations as detailed in this report. The nature and continuity of subsoil conditions at locations other than the investigation bores and tests are inferred and it shall be appreciated that actual conditions could vary from the assumed model.

It is recommended that construction activity shall be undertaken in the dry season. If construction activities are undertaken in wet seasons there is a potential risk of reduction of soil strength. Tilsley Engineering Ltd is not responsible for the reduction in soil strength due to construction activities.

Ground conditions can vary with time, fill may be placed on a site and pollutants may migrate with time. Because a report is based on conditions that existed at the time of subsurface exploration, decisions shall not be based on a report whose adequacy may have been affected by time. Tilsley Engineering Ltd to be advised how time may have impacted on the project.

This report is based on the assumption that the site conditions as revealed through investigation stages are indicative of actual conditions throughout an area. This assumption cannot be substantiated until project implementation has commenced and therefore this report recommendations can only be regarded as preliminary. Only Tilsley Engineering Ltd, who prepared the report, is fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes shall be considered as the project develops. If another party undertakes the implementation of the recommendations of this report, there is a risk that the report will be misinterpreted and Tilsley Engineering Ltd cannot be held responsible for such misinterpretation.



APPENDIX B – CALCULATIONS

Wastewater System Design Calculations:	Dripper line disposal calculations	
Address:	1799a Great South Road	
Clients:	Vernon Developments Ltd.	
Date:	5/05/2025	
Design by:	Tilsley Engineering Ltd, 27 Roulston St, Pukekohe	
Design in accordance with TP 58		
Soils category estimated from soakage test:	Category 5	
Water supply:	Roof supply & Water Bore	
Total Number of Day-staff	30	
Number of <u>Transient</u> Day-staff:	20	
Wastewater flow allowance per transient staff:	20	L/person/day
Number of <u>Permanent</u> Day-staff:	10	
Waste water flow allowance per permanent staff:	40	L/person/day
Total daily wastewater production:	800	litres/day
Days of storage required:	7	days
Days of emergency storage required:	2	days
Total Wastewater storage volume required	7200	litres



APPENDIX C - DIAGRAMS AND DETAILS

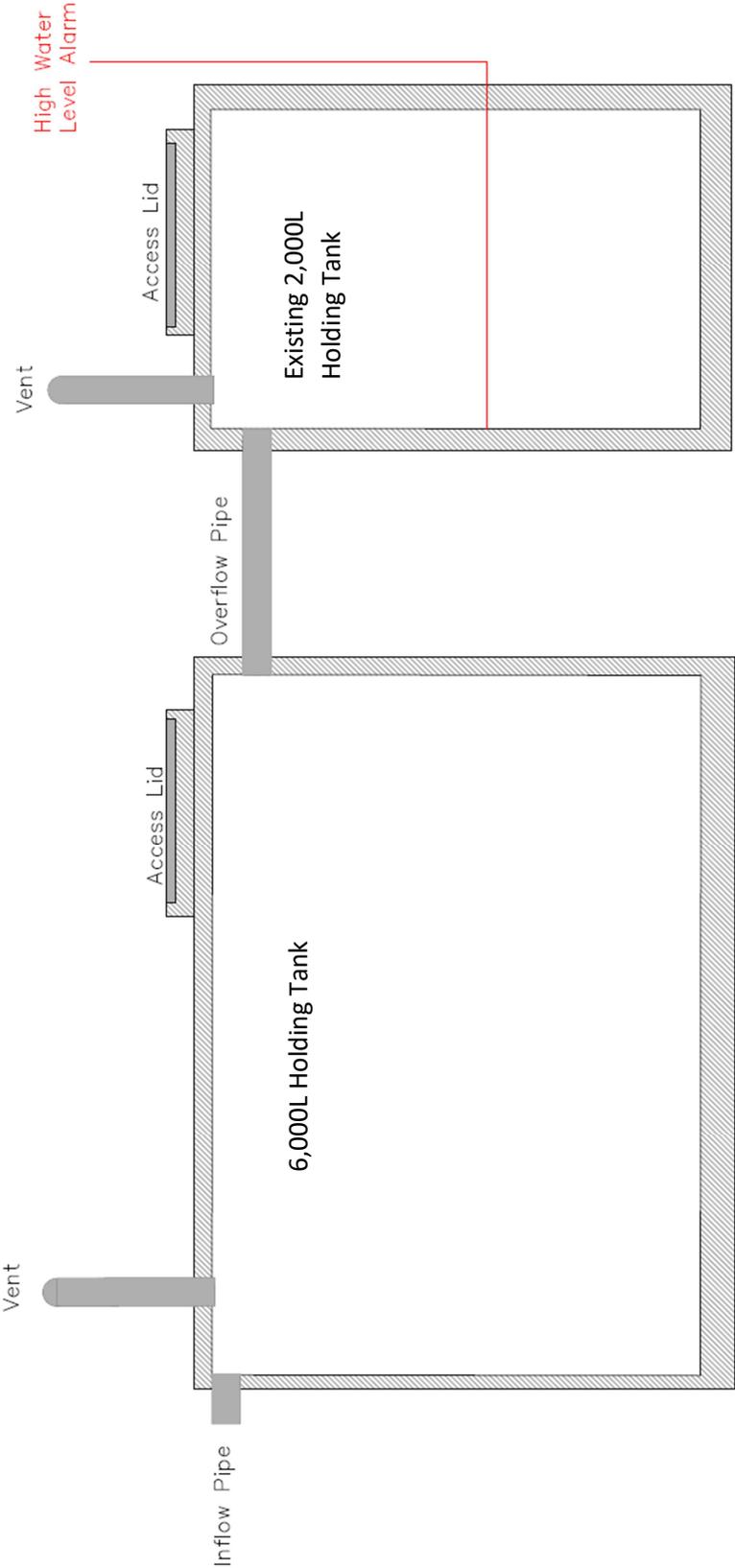


Figure 3 Holding Tank Layout Schematic.



APPENDIX E – WASTEWATER OPERATION AND MAINTENANCE FORMS

Operational & Maintenance form

On-site Wastewater System Management Procedure

(As per ARC Technical Sheet H1)

Property Owner: _____

Date: _____

Property Address: _____

System Designer

Firm Tilsley Engineering phone 09 2383245

Installation

Supplier/installer _____ phone _____

Drainlayer _____ phone _____

Electrician _____ phone _____

Building Consent No: _____

Date Approved _____

Date Installed _____

Territorial Authority _____

Expiry date _____

Max discharge Vol _____

Other conditions (if any) -----

Client	Vernon Developments Ltd.		
Address	1799a Great South Road, Bombay		
ROUTINE MAINTENANCE CHECKLIST - ONSITE WASTEWATER			
			Action
Annually	2- yearly	5- yearly	
	NA		Grease Trap - pump out frequency
X			Septic/Holding Tank - visual check for leaks & rectify - pump out frequency
	NA		Filter: visual check, hose off any solids
	NA		Siphon & Distribution Box: visual check
	NA		Pump & Alarm: Check to see if functioning by electrician
	NA		Trench System - Vegetation maintenance, inspect vent, check irrigation area for wet ground
	NA		ETS Beds / Mounds - inspect vents, maintain plant growth, remove weeds, surface water diversion in place
	NA		AWTS - specific maintenance contract by supplier
			Any ongoing maintenance to be carried out by the owner and suitably qualified maintenance contractor