27 February 2023

Attn: Aaron Collier
The Pitau LP
PO Box 15083

Tauranga 3144

Dear Aaron

Geotechnical and Environmental Assessment of Effects, The Pitau Development - Pitau Road, Mt Maunganui, Tauranga

(Our Reference: 20813.000.001_05)

1 Introduction

ENGEO are the Geotechnical and Environmental consultants engaged as part of the development of The Pitau and have undertaken investigations, analysis and reporting to date for the development works.

We understand that consenting of the development is to include applying for fast-track processing. As part of this process and based on our current knowledge and understanding of the site, ground conditions and development proposed, we provide the following statements with respect to the management of geotechnical and environmental effects on the development.

2 Geotechnical Effects

2.1 Groundwater

Groundwater levels at the site have been assessed as ranging from RL0.5m to RL1.7m based on investigations to date. We observed some tidal influence on groundwater level fluctuations during our monitoring however they were considered to vary less than 100mm during our monitoring over several weeks.

Based on the current expected basement construction levels, temporary works dewatering is not anticipated for the majority of the works and permanent dewatering is not considered to be required. These conclusions will need to be revisited if the basement detailed design was to be deepened from current proposed levels (4mRL). Temporary dewatering may be needed around lift shaft excavations however details are yet be confirmed here. Provided the lift shaft is tanked, then permanent dewatering will not be required.

Environmental effects on groundwater conditions are therefore expected to be low for the development with no mitigation for permanent works required. No consent conditions

are considered necessary for permanent dewatering. Temporary works dewatering may need specific consent if the assessed flow rate under temporary works is to exceed 80L/sec, which is the Regional Plan Permitted dewatering discharge rate. However, given the current basement design level this appears to be unlikely.

2.2 Earthworks Operations

Given the extent of basement excavation proposed, earthworks operations are expected to involve a high volume of export of site won materials, generally clean dune sands, excavated from the basement area. Import of gravel materials are expected for the ground improvement raft mitigation beneath the basement footprint, and for pavements and infrastructure (service trenches, soakage devices etc). An amount of existing mixed fill materials containing construction waste, estimated up to 5,000m3 is expected to be taken to landfill, with the remaining cuts to be used as clean sand fill. Refer to environmental comments regarding expected volumes of surficial or near surface contaminated soils.

The bulk of the earthworks operations are likely to involve standard earthmoving equipment such as excavators, trucks and compaction plant.

Environmental effects associated with earthworks operations include the generation of dust, noise, vibration and cartage of materials to and from site. These effects will be managed as part of the site management plan which is to be prepared by Lysaght Consultants. This includes the use of specific silt, erosion and dust controls with provision for water use for dust suppression.

Consent conditions related to silt and erosion controls and dust suppression works required. Consent conditions regarding groundwater take for dust suppression required if bore water is proposed to be used.

2.3 Geotechnical Ground Improvements

Ground improvements are required to provide suitable bearing capacity under earthquake/seismic conditions for this development. Ground improvement works are likely to include rigid/semi rigid inclusions and formation of a reinforced gravel raft beneath the basement. In addition, retaining structures are required to support the basement construction and mitigate effects on neighbouring properties. Specialist equipment will be necessary for deep ground improvement. Standard earthmoving equipment such as excavators, dump trucks and compaction plant will be used for construction of a gravel raft.

Works to form the ground improvements and retaining structures are not expected to require dewatering for construction works, with the exception of localised excavations around lift shafts which may require localised deepening of gravel raft (refer to groundwater section comments above).

Environmental effects from ground improvements are primarily expected to be the same for the earthworks operations, involving dust generation, noise, vibration and cartage of materials. Deep ground improvement inclusions will extend below the groundwater table, with installation of improvements involving soil mixing or grouting of inclusions within the watertable. Past experience with similar ground improvements have not required specific consents for works.

Consent conditions related to groundwater take, silt and erosion controls and dust suppression works required. Consent conditions regarding groundwater take for dust suppression required if bore water is proposed to be used.

2.4 Stormwater

In-ground soakage and attenuation are proposed to capture stormwater discharge from the development. The effects from discharge to groundwater are yet to be assessed by ENGEO, however soakage testing was undertaken to prove concept. Soakage test results from ENGEO's investigations confirmed infiltration rates of between 1,600 L/m2/hour and 3,000 L/m2/hour which is at or above the average infiltration into the natural sands expected in Mt Maunganui/Papamoa and should be sufficient for soakage design purposes for the development.

Lysaght are carrying out detailed stormwater design and will provide a detailed model as part of specific design to confirm that there are no adverse effects post development. Indications are that the overall soakage discharge rate is anticipated to be less than 125 L/sec with the on-site attenuation provided with slow discharge storage tanks.

Environmental effects from soakage to be determined as part of future works (awaiting confirmation of soakage locations). Effects will be related to groundwater flow from design discharge.

Consent will be required if groundwater soakage rate in excess of 125L/sec is required.

3 Environmental Contaminants

Following our site investigations and testing, regional background concentrations have been exceeded in a number of samples across the site. Selected heavy metals exceeded the adopted human health criteria (lead, arsenic and cadmium) and zinc was found to exceed the environmental discharge criteria in a handful of samples. Asbestos was detected in one sample under a presence/absence analysis, further sampling and semi-quantitative analysis from this area did not present positive results.

Consents under National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health

The Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS) applies to activities, specifically disturbing soil on a piece of land, subdividing land and changing the use of a piece of land as per clauses 5(4), 5(5) and 5(6) respectively, these are outlined below:

5(4) An activity is disturbing the soil of the piece of land, which—

a. means disturbing the soil of the piece of land for a particular purpose:

b. does not include disturbing the soil of the piece of land, whatever the purpose, if the land is land to which regulation 33(9) or 36 of the Resource Management (National Environmental Standard for Electricity Transmission Activities) Regulations 2009 applies.

Based on the information presented within this report, ENGEO believe condition 5(4)a apply to this site.

5(5) An activity is subdividing land, which means subdividing land—

a. that has boundaries that are identical with the boundaries of the piece of land; or

b. that has all the piece of land within its boundaries; or

c. that has part of the piece of land within its boundaries.

5(6)) An activity is changing the use of the piece of land, which means changing it to a use that, because the land is as described in subclause (7), is reasonably likely to harm human health.

Based on our review of site information, it is our opinion that clauses 5(5) and 5(6) do not apply to this site, as there is no proposed subdivision of the existing site, nor is the land use proposed to be changed, as such a subdivision consent is not likely to be required.

Land Covered

5(7) The piece of land is a piece of land that is described by one of the following:

a. an activity or industry described in the HAIL is being undertaken on it;

b. it is more likely than not that an activity or industry described in the HAIL is being or has been undertaken on it.

The desk top study determined that it was considered more likely than not that the following HAIL activities have been identified on or within the vicinity of the site:

c. HAIL ID E1: *Asbestos products manufacture or disposal including sites with buildings containing asbestos products known to be in a deteriorated condition.* This is a results of existing, recent and/or historic structures at the site; and,

d. HAIL ID I: *Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environmen*t. This is a result of potential fill material identified across the norther portion of the site.

The NESCS applies to certain activities taking place on HAIL land including soil disturbance (relevant to the proposed works). As HAIL activities have been identified across the majority of the site, the whole site is therefore considered a piece of land and is subject to the NESCS.

Controlled Activities

Removing or replacing fuel storage system, sampling soil or disturbing soil

9 (1) If a requirement described in any of regulation 8(1) to (3) is not met, the activity is a controlled activity while the following requirements are met:

a. A detailed site investigation of the piece of land must exist;

b. the report on the detailed site investigation must state that the soil contamination does not exceed the applicable standard in regulation 7:

c. the consent authority must have the report:

d. conditions arising from the application of subclause (2),

9 (2) The matters over which control is reserved are as follows:

a. the adequacy of the detailed site investigation, including—
    a. site sampling:
    b. laboratory analysis:
    c. risk assessment:
b. (b) how the activity must be—
    a. managed, which may include the requirement of a site management plan:
    b. monitored:
    c. reported on:
c. the transport, disposal, and tracking of soil and other materials taken away in the course of the activity:
d. the timing and nature of the review of the conditions in the resource consent:
e. the duration of the resource consent.

Based on our review of site information, it is our opinion provided condition 9 (1) c and d are undertaken and conditions which may arise from condition 9 (2) are met, soil disturbance at the site may be undertaken as a controlled activity.

Consents under Bay of Plenty Natural Resources Plan (BoP NRP)

The BoP NRP defines contaminated land as:

A location at which hazardous substances in soil, ground water or surface water occur at concentrations above the background levels of those substances in the surrounding environment and where assessment indicates that those substances pose, or are likely to pose, an immediate or long-term hazard to human health or the environment.

Whilst the soil concentrations are above background and the site cannot be considered “clean”, we do not consider the contamination status of the soils pose an immediate or long-term hazard to human health of the environment. Furthermore, given the nearest waterway is the ocean which is approximately 400m away from the site and groundwater levels based on current ground level are at a depth of approximately 8m below ground level, provided robust erosion and sediment controls are employed to minimise dust and sediment runoff, any potential discharges can be managed and mitigated.

Based on our review of site information and the reasons outlined above, it is our opinion that the site is not considered “contaminated land” and will not require a consent under BoP NRP.

4 Limitation

i. We have prepared this letter in accordance with the brief as provided. This report has been prepared for the use of our client, The Pitau LP, their professional advisers and the relevant Territorial Authorities in relation to the specified project brief described in this report. No liability is accepted for the use of any part of the report for any other purpose or by any other person or entity.

ii. The recommendations in this report are based on the ground conditions indicated from published sources, site assessments and subsurface investigations described in this report based on accepted normal methods of site investigations. Only a limited amount of information has been collected to meet the specific financial and technical requirements of the Client's brief and this report does not purport to completely describe all the site characteristics and properties. The nature and continuity of the ground between test locations has been inferred using experience and judgement and it should be appreciated that actual conditions could vary from the assumed model.

iii. This Limitation should be read in conjunction with the Engineering NZ / ACENZ Standard Terms of Engagement.

iv. This letter is not to be reproduced either wholly or in part without our prior written permission.

We trust that this information meets your current requirements. Please do not hesitate to contact the undersigned on (07) 777 0209 if you require any further information.

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