

5 December 2023

Waka Kotahi New Zealand
C/O Tina Kalmar
Victoria Arcade
50 Victoria Street
Wellington

Weigh Right Bombay - Site Investigation Report Review

Project No. 5-C4353.04
File/Ref 5C4353-WSP-04-LT-EH-1000-RevB

Dear Tina,

Background

Waka Kotahi New Zealand (the client) propose to develop a commercial vehicle centre and weigh bridge (the project) at 253 Mill Road, Bombay, Auckland (the site), located adjacent to the intersection of Great South Road and Mill Road (Figure 1 below). WSP New Zealand Limited (WSP) has been engaged to review previous investigations undertaken at the site and additional supporting information not previously presented.

Figure 1 Site Location, 253 Mill Road, Bombay, Auckland (outlined in cyan)





Previous Investigations

High-Level Contaminated Land Assessment – Bombay (Jacobs, 2019)

Jacobs New Zealand Limited (Jacobs) was engaged by Waka Kotahi to prepare a high-level desktop assessment to identify whether HAIL activities are likely to have been occurred on the site (Jacobs, 2019) (Attachment B). The main findings of the high-level assessment were as follows:

- A review of information provided by Auckland Council’s Environmental Health Unit of the Licensing and Compliance Services Department and historical aerial imagery indicated that:
 - The site has possibly been subject to the storage and/or use of chemicals and pesticides from horticultural or poultry operations; and
 - The age of some of the buildings that were on-site meant that it was possible that asbestos containing materials may have been used during construction of the buildings.

Jacobs subsequently recommended:

- A detailed site investigation (DSI) be undertaken to characterise contaminant concentrations where soil was to be disturbed; and
- Following completion of the DSI, a Contaminated Land Management Plan (CLMP) be developed to manage contaminated soils and protect human health during the works.

Bombay Contaminated Land Assessment – Soil Sampling (Jacobs, 2020)

Jacobs undertook targeted soil sampling at the site based on the high-level desktop assessment (Jacobs, 2020) (Attachment B) and provided recommendations on soil reuse and/or disposal during construction of the proposed weigh bridge facility.

The stated objectives of the investigation were to:

- Determine the presence or absence of metals, pesticides, and asbestos in soils at the site; and
- Provide recommendations regarding soil reuse and/or disposal during construction of the proposed weigh station facility.

Soil sampling was undertaken on 26 May and 2 June 2020 and targeted areas of proposed soil disturbance for construction of the proposed weigh station facility. Soil samples were collected from test pits in five locations at three depths below ground level (0.1 m bgl, 0.5 m bgl and 1.0 m bgl). All shallow soil samples (0.1 m bgl) were analysed for heavy metals, pesticides, and asbestos.

Jacobs concluded that contaminant concentrations complied with the background ranges for trace metals in Auckland soil (volcanic) and the permitted activity soil acceptance criteria which are presented in the Auckland Unitary Plan (AUP) (AUP, 2021). Contaminant concentrations in soil also complied with Soil Contaminant Standards (SCS) for industrial/commercial land-use (MfE, 2012) applicable under the Resource Management



(National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS, 2011).

Based on one sample of five returning a trace detection of asbestos in soil, Jacobs also concluded that asbestos could be present in shallow soil in some parts of the site, potentially related to the shedding of fibres from asbestos containing material (ACM) in building fabric.

Jacobs concluded that a site management plan (SMP) was required for the proposed weigh bridge development setting out the framework for soil management in the event of encountering unexpected contamination.

Auckland Council Contaminated Site Enquiry

WSP requested an Auckland Council (AC) contaminated site enquiry for the site and surrounding properties (Attachment C). AC files consider the site has possibly been subject to HAIL A10, persistent pesticide bulk storage or use.

Records indicated the site has been utilised for horticulture and poultry activities since at least 1960. Additionally, the age of the buildings at the site has the potential to contain asbestos and/or lead based paint. In a 200 m buffer surrounding the site pollution incidents, bores, contaminated site and air discharges, industrial trade process consents, closed landfills and air quality permitted activities are identified.

Site Walkover

A WSP environmental scientist (ES) undertook a site walkover on 28 February 2022 to confirm the site had remained relatively unchanged since the Jacobs soil sampling in May 2020.

During the site walkover the ES confirmed the site was predominately pastoral land with farm buildings and a residential house located in the west of the site. The ephemeral stream in the centre of the site was dry with water present in the pond. The east of the site was unchanged and was being used for commercial/industrial use. No visual signs of contamination or stockpiled rubbish was observed on site.

Findings

WSP undertook a review of previous Jacobs reports for the site and undertook an updated Auckland Council contaminated site enquiry and site walkover.

Four out of five sample locations were reported with results commensurate with expected naturally occurring background concentrations.

A surface sample collected at SA03 was reported with an Arsenic level of 20 mg/kg which exceeded an expected background of 12 mg/kg. A single trace detection of asbestos less than 0.001 % w/w was also identified in SA03. A deeper sample from SA03 at 0.5 m bgl was reported with metal concentrations not exceeding expected background. Asbestos was not analysed.

The previous Jacobs investigations appeared to be generally commensurate with the Ministry for the Environment (MfE) Contaminated Land Management Guidelines (CLMG) although the scope of both investigations was basic and limited in detail and scale. Our additional data review did not uncover significant evidence that minor data gaps of the



Jacobs investigations, if further explored, would significantly impact the findings of their reports.

Conclusions

- 1) The reports provided by Jacobs, although brief, do not contain significant omissions of data or inaccuracies of conclusions. Jacobs referred to basic elementary statistics of the data from five samples, which is not best practice for analysing environmental data; however, this does not significantly change the findings of the reports.
- 2) The marginally elevated results of arsenic, a contaminant known to be associated with poultry farming (Gerber, C, & H., 2007), and a trace detection of asbestos, known to be associated with older buildings (NZGAMAS, 2017), are in an area that is unlikely to be disturbed by the proposed development. Additionally, one surface soil sample that marginally exceeds a guideline value, where an underlying soil sample does not exceed a guideline value, does not present a significant risk to the project or the environment. A single trace detection of asbestos in soil does not present a significant human health risk.
- 3) Considering the history of the former land use within the proposed project area, consistency within the soil testing results, the absence of additional contaminants such as pesticides, the absence of reportable asbestos in all but one soil samples tested, and the metal/metalloid analyte concentrations generally commensurate with background concentrations, the excavated soil will likely be acceptable as 'clean fill material'.
- 4) Commensurate with NESCS Reg 5(9) the site has been subject to a detailed site investigation (DSI) that has identified analytes in soil as commensurate with background and therefore the NESCS does not apply to the site.
- 5) Commensurate with the AUP E30.6.1 the quality of the soil at site is generally acceptable with expected background. Consequently, the works are within the PA provisions of Rule E30.4.1.(A4) and meet the corresponding AUP Standard E30.6.1.4.
- 6) WSP are of the opinion that consent under the NESCS or AUP is therefore not required.

Regards,

Colin Jowett
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Maia Bellingham
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References

- AUP. (2021). *Auckland Unitary Plan*. Auckland: Auckland Council.
- Gerber, P., C, O., & H., S. (2007). Poultry production and the environment - a review. *Animal Production and Health Division, Food and Agriculture Organization of the United Nations*.
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- NESCS. (2011). *Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011*.
- NZGAMAS. (2017). *New Zealand Guidelines for Assessing and Managing Asbestos in Soil*.

Attachment A

Disclaimer and Limitations

Disclaimer and Limitations

Scope of Services

This report ('Report') has been prepared by WSP exclusively for Waka Kotahi ('Client') in relation to contaminated land at 253 Mill Road, Bombay, Auckland ('Purpose') and in accordance with the Weigh Right Programme Pre-Implementation and Implementation Contract No 5032, Amendment 8, 31 March 2017. The findings in this Report are based on and are subject to the assumptions specified in the Report. WSP accepts no liability whatsoever for any reliance on or use of this Report, in whole or in part, for any use or purpose other than the Purpose or any use or reliance on the Report by any third party.

This Report has been prepared in accordance with the scope of services set out in the contract, or as otherwise agreed, between the client and WSP (scope of services). In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

Reliance on Data

In preparing the Report, WSP has relied upon data, surveys, analyses, designs, plans and other information provided by the client and other individuals and organisations, most of which are referred to in the report (the data). Except as otherwise stated in the Report, WSP has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the Report (conclusions) are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. WSP will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to WSP.

Environmental Conclusions

In accordance with the scope of services, WSP has relied upon the data and has conducted environmental assessments in the preparation of the Report. The nature and extent of assessments conducted are described in the Report.

On all sites, varying degrees of non-uniformity of the vertical and horizontal soil or groundwater conditions are encountered. Hence no monitoring, assessment, common testing or sampling technique can eliminate the possibility that monitoring or testing results/samples are not totally representative of soil and/or groundwater conditions encountered. The conclusions are based upon the data and the environmental field assessments, monitoring and/or testing and are therefore merely indicative of the environmental condition of the site at the time of preparing the Report, including the presence or otherwise of contaminants or emissions.

Also, it should be recognised that site conditions, including the extent and concentration of contaminants, can change with time.

Within the limitations imposed by the scope of services, the assessments, monitoring, testing, sampling and preparation of this Report have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of

skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, expressed or implied, is made.

Report for Benefit of Client

The Report has been prepared for the benefit of the client and no other party. WSP assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the Report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the Report (including without limitation matters arising from any negligent act or omission of WSP or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the Report or the accuracy or completeness of any conclusions and should make their own enquiries and obtain independent advice in relation to such matters.

Other Limitations

WSP will not be liable to update or revise the Report to take into account any events or emergent circumstances or facts occurring or becoming apparent after the date of the report.

The scope of services did not include any assessment of the title to, or ownership of, the properties, buildings and structures referred to in the Report nor the application or interpretation of laws in the jurisdiction in which those properties, buildings and structures are located.

Attachment B

Jacobs Previous Investigations



Weigh Right Programme

Bombay Contaminated Land Assessment - Soil Sampling

IZ105201-A.P4.TE.034.P034-NW-RPT-0001 | A

September 23, 2020

Waka Kotahi NZ Transport Agency



Weigh Right Programme

Project No: IZ105201
 Document Title: Bombay Contaminated Land Assessment - Soil Sampling
 Document No.: IZ105201-A.P4.TE.034.P034-NW-RPT-0001
 Revision: A
 Date: September 23, 2020
 Client Name: Waka Kotahi NZ Transport Agency
 Project Manager: Ashley Rideout
 Author: Kate Murray
 File Name: Bombay Contaminated Land Assessment - Soil Sampling_Rev A

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Document history and status

Revision	Date	Description	Author	Checked	Reviewed	Approved
A	18/08/20	Draft for internal review	KM	KT	KT	KT
	23/08/20	Draft for client review	KM	KT	AH	BW

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Executive Summary

This report has been prepared for Waka Kotahi NZ Transport Agency by Jacobs New Zealand Limited (Jacobs) in accordance with the Jacobs proposal dated 21 May 2020. It documents the results of the soil contamination investigation undertaken at the proposed weigh station facility at 253 Mill Road, Bombay, located adjacent to the intersection of Great South Road and Mill Road.

The objectives of the soil contamination investigation were to:

- Determine the presence or absence of heavy metals, pesticides and asbestos in soils at the site; and
- Provide recommendations regarding soil reuse and/or disposal during construction of the proposed weigh station facility.

Soil sampling was undertaken on 26 May and 2 June 2020 and targeted areas that will be subject to soil disturbance as a result of construction of the proposed weigh station facility. Soil samples were collected from test pits in five locations at three depths below ground level (0.1 m bgl, 0.5 m bgl and 1.0 m bgl). All shallow soil samples (0.1 m bgl) were analysed for heavy metals, pesticides, and asbestos with the samples obtained from 0.5 m bgl being analysed for heavy metals and pesticides. The samples obtained from a depth of 1.0 m bgl were retained 'hold cold' by Hill Laboratories pending the analytical results of the shallow soil samples.

Soils encountered were natural ground comprising a shallow surficial greyish brown clayey sand topsoil layer overlying a brownish orange clay layer. No visual or olfactory signs of contamination were observed in any of the sampling locations.

The analytical results show that contaminant concentrations comply with the background ranges for trace metals in Auckland soil (volcanic) and the permitted activity soil acceptance criteria presented in the AIP OIP. Contaminants of Potential Concern (CoPC) concentrations in soil also comply with available Soil Contaminant Standards for industrial/commercial land-use.

The results indicate that asbestos could be present in shallow soil in some parts of the site, potentially related to the shedding of fibres from asbestos containing material (ACM) in building fabric. One sample of five tested contained asbestos at concentrations less than soil guideline levels.

Given that the site is a HAIL site, it is recommended that a site management plan (SMP) is developed setting out the requirements for soil management during the works in the event of encountering unexpected contamination.

Important note about your report

The sole purpose of this report and the associated services performed by Jacobs New Zealand Limited (Jacobs) is to present the results of a limited soil sampling programme undertaken at the proposed weigh station facility in at 253 Mill Road, Bombay, located adjacent to the intersection of Great South Road and Mill Road, and provide advice in relation to existing contamination levels in soil to New Zealand Transport Agency (the client), in accordance with the scope of services set out in the contract between Jacobs and the Client. That scope of services, as described in this report, was developed with the Client.

In preparing this report, Jacobs has relied upon, and presumed accurate, any information (or confirmation of the absence thereof) provided by the Client and/or from other sources. Except as otherwise stated in the report, Jacobs has not attempted to verify the accuracy or completeness of any such information. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that our observations and conclusions as expressed in this report may change.

Jacobs derived the data in this report from information sourced from the Client (if any) and/or available in the public domain at the time or times outlined in this report. The passage of time, manifestation of latent conditions or impacts of future events may require further examination of the project and subsequent data analysis, and re-evaluation of the data, findings, observations and conclusions expressed in this report.

Jacobs has prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

This report should be read in full and no excerpts are to be taken as representative of the findings. No responsibility is accepted by Jacobs for use of any part of this report in any other context. This report has been prepared on behalf of, and for the exclusive use of, Jacobs's Client, and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and the Client. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

1. Introduction

1.1 Terms of Reference

This report has been prepared for Waka Kotahi NZ Transport Agency by Jacobs New Zealand Limited (Jacobs) in accordance with the Jacobs proposal dated 21 May 2020. It documents the results of the soil contamination investigation undertaken at the proposed weigh station facility site at 253 Mill Road, Bombay, located adjacent to the intersection of Great South Road and Mill Road (**Figure 1.1**). The land parcel on which the proposed weigh station facility is located is legally described as Lot 1 DP 124783.

Figure 1.1: Location of the proposed weigh station facility at Bombay (See **Appendix A**)

1.2 Background

In September 2019 Jacobs completed a high-level contaminated land preliminary site assessment (PSI) for the site, which comprised a review of Auckland Council's records and historical aerial imagery. The high-level PSI noted that the site has possibly been subject to the storage and/or use of chemicals and pesticides from horticultural or poultry operations since at least 1960. The site is therefore likely to be a HAIL site under Category A10 which relates to the bulk storage or use of persistent pesticides. In addition, the age of some of the buildings currently on-site indicated the potential for the presence of asbestos containing materials (ACM) in building fabric. It was therefore recommended that soil samples be collected as part of the Geotechnical Investigation (GI) to characterise contaminant concentrations where soil is to be disturbed as a result of the works.

The PSI is presented in **Appendix B**.

1.3 Objectives

The objectives of the soil contamination investigation were to:

- Determine the presence or absence of heavy metals, pesticides and asbestos in soils at the site; and
- Provide recommendations regarding soil reuse and/or disposal during construction of the proposed weigh station facility.

1.4 Scope of Work

The scope of work comprised the following:

- Preparation of the Health, Safety and Environment Plan controlling site investigations and liaison with geotechnical field staff who were on-site collecting samples;
- Collection of soil samples at three depths from test pits excavated during the GI (approximately 0.1 m below ground level (bgl), 0.5 m bgl and 1.0 m bgl);
- Laboratory analysis of soil samples for Contaminants of Potential Concern (CoPC) based on the historic land use, comprising heavy metals, organochlorine pesticides (OCP) and asbestos; and
- Factual reporting.

2. Soil Sampling and Analysis

Soil sampling targeted areas that will be subject to soil disturbance as a result of construction of the proposed weigh station facility. The soil sampling locations are shown in **Figure 2.1**.

Figure 1.2: Soil sampling locations (See **Appendix A**).

On 26 May and 2 June 2020, 15 No. samples were obtained during the GI from test pits in five locations (SA01, SA02, SA03, TP01 and TP02) at three depths (0.1 m bgl, 0.5 m bgl and 1.0 m bgl). Test pit locations were returned to their original state following collection of the soil samples.

Test pit logs are presented in **Appendix C**. Photographs are presented in **Appendix D**.

Soil samples were obtained from the excavator bucket using a stainless trowel directly into laboratory supplied sampling jars, in accordance with Jacobs field procedures. All soil samples were stored in a chilly bin and consigned to R J Hill Laboratories Limited (Hill Laboratories), an IANZ accredited laboratory, under chain of custody documentation. All shallow soil samples (0.1 m bgl) were analysed for heavy metals, pesticides, and asbestos, with the samples obtained from 0.5 m bgl being analysed for heavy metals and pesticides. The sample analysis was executed in line with the sampling and analysis plan shown in **Table 2.1**. Relevant chain of custody documentation and the laboratory reports as received are presented in **Appendix E**. The samples obtained from a depth of 1.0 m bgl were retained 'hold cold' by Hill Laboratories pending the analytical results of the shallow soil samples.

Table 2.1: Sampling and analysis plan as executed

Location	Sample Depth (m bgl)	Analyses
SA01	0.1	Metals, OCPs, Asbestos
	0.5	Metals, OCPs
	1.0	Hold cold
SA02	0.1	Metals, OCPs, Asbestos
	0.5	Metals, OCPs
	1.0	Hold cold
SA03	0.1	Metals, OCPs, Asbestos
	0.5	Metals, OCPs
	1.0	Hold cold
TP01	0.1	Metals, OCPs, Asbestos
	0.5	Metals, OCPs
	1.0	Hold cold
TP02	0.1	Metals, OCPs, Asbestos
	0.5	Metals, OCPs
	1.0	Hold cold
Notes: Metals - Arsenic, Cadmium, Chromium, Copper, Lead, Nickel, Zinc and Mercury OCPs – Organochlorine Pesticides Asbestos - analysed under the New Zealand Guidelines Semi-quantitative asbestos in soils. The full analytical suite is shown in Appendix C and Appendix D		

3. Results and Discussion

3.1 Observations

The site is currently in pastoral grass.

The soils encountered comprised a greyish brown clayey sand upper organic soil layer with trace rootlets (i.e., topsoil) extending down to approximately 0.275 m bgl. From 0.275 m bgl to 1.0 m bgl, a brownish orange clay layer with trace sand was present.

No visual or olfactory signs of contamination were observed in any of the sampling locations.

Groundwater was not encountered at any of the sampling locations.

The soils are interpreted to be tuff (QVs) associated with the South Auckland Volcanic Field¹.

3.2 Analytical Results

The results for heavy metals and OCPs were compared with background ranges for trace elements in soil (volcanic) and the permitted activity soil acceptance criteria in Section E30 of the Auckland Unitary Plan Operative in Part (AUP OIP) and soil contaminant standards (SCS) from the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS) for commercial/industrial land use².

The results for asbestos were compared with Table 5 of the BRANZ New Zealand Guideline for Assessing and Managing Asbestos in Soil³ for commercial and industrial use.

The analytical results are tabulated in Appendix F.

The following points are noted:

- a) Heavy Metals: Concentrations of arsenic (20 mg/kg) in the shallow soil sample from SA03 exceeded the background range for trace elements in Auckland, Volcanic Range soils (12 mg/kg).
- b) Heavy Metals: Apart from arsenic in SA03, all remaining test results for shallow soil within the proposed development area were below background ranges for trace elements in Auckland, Volcanic Range soils. All test results were below the AUP OIP permitted activity soil acceptance criteria.
- c) Arsenic for all soils was present at a mean concentration of 9.7 mg/kg and 12 mg/kg at the 95% confidence limit of the mean, compared with a background upper limit of 12 mg/kg.
- d) OCPs: test results for soil within the proposed development area were less than the limits of reporting (LOR).
- e) Asbestos: Results show that one sample (SA03) out of the five that was analysed for asbestos contained asbestos material (Crocidolite (blue) asbestos) in the form of loose fibres (minor). The asbestos in ACM as a percentage of total sample for SA03 was <0.001%. The weight of asbestos as asbestos fines (friable) was 0.0003 g dry wt. The combined fibrous asbestos & asbestos fines (FA & AF) as percentage of total sample for this sample was <0.001%. This sample does not exceed the FA and/or AF guidelines set out in Table 5 of the BRANZ Guideline Document

¹ Institute of Geological and Nuclear Sciences 2001. 1:250,000 Geological Map Auckland

² Soil containment standards for health (SCS_(health)) for inorganic substances – commercial / industrial outdoor worker (unpaved)

³ <https://www.branz.co.nz/asbestos>

- f) All test results are below the SCS for industrial/commercial land-use, as identified in Table B2 and Table B3 of the NESCS and the AUP permitted activity soil acceptance criteria.

4. Conclusion

The soil contamination investigation at the proposed weigh station facility at 253 Mill Road, Bombay, located adjacent to the intersection of Great South Road and Mill Road, identified that the soils encountered were natural ground comprising a surficial greyish brown clayey sand topsoil layer overlying a brownish orange clay layer associated with the South Auckland Volcanic Field. No visual or olfactory signs of contamination or soil disturbance were observed in any of the sampling locations.

The analytical results show that contaminant concentrations comply with the background ranges for trace metals in Auckland soil (volcanic) and the permitted activity soil acceptance criteria presented in the AUP OIP. CoPC concentrations in soil also comply with available SCS for industrial/commercial land-use.

The results indicate that asbestos could be present in shallow soil in some parts of the site, potentially related to the shedding of fibres from ACM in building fabric. One sample of five tested contained asbestos at concentrations less than soil guideline levels.

Given that the site is HAIL, it is recommended that a site management plan (SMP) is developed setting out the requirements for soil management during the works in the event of encountering unexpected contamination.

Appendix A. Figures

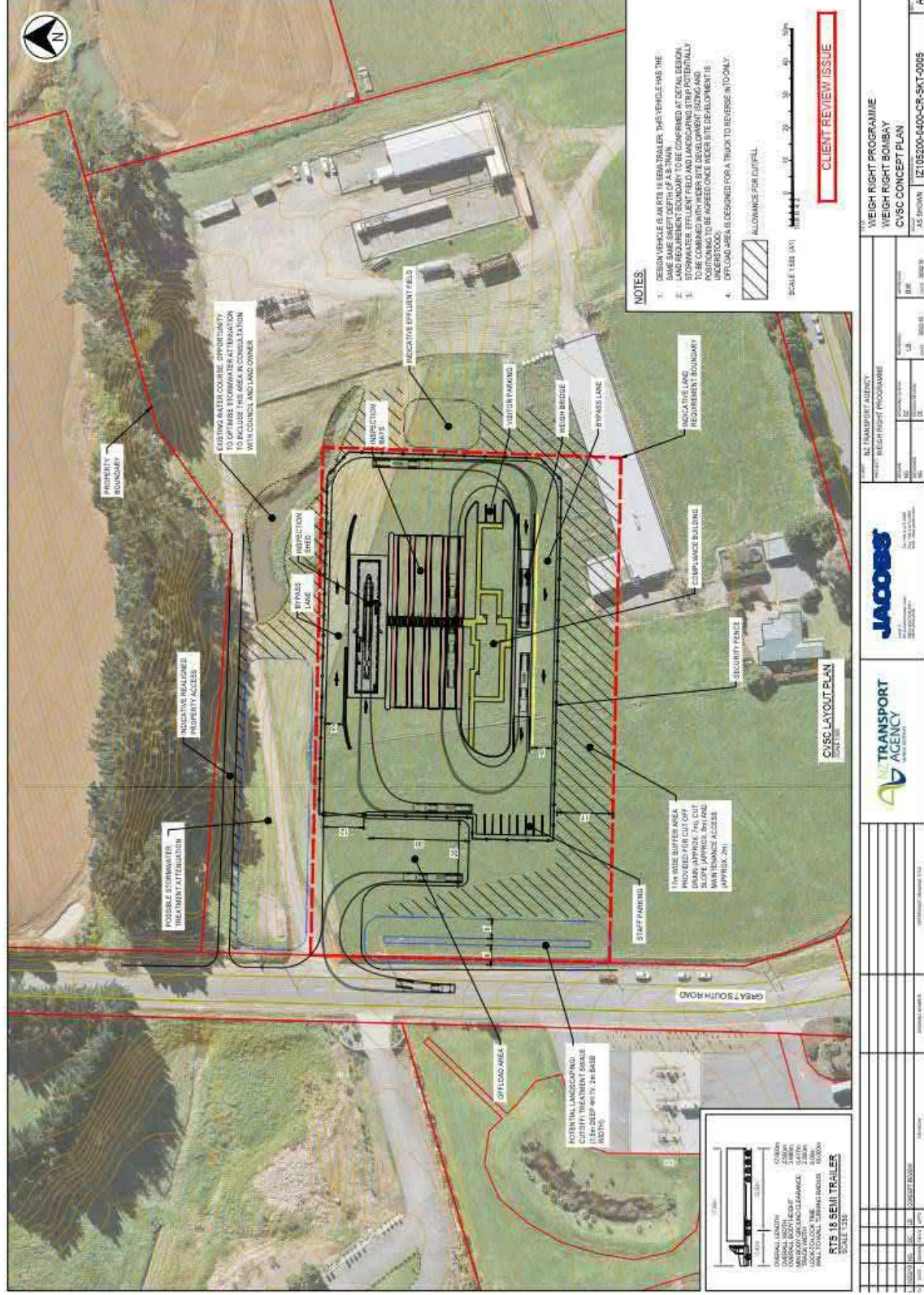


Figure 1.1: Location of the proposed weigh station facility at Bombay

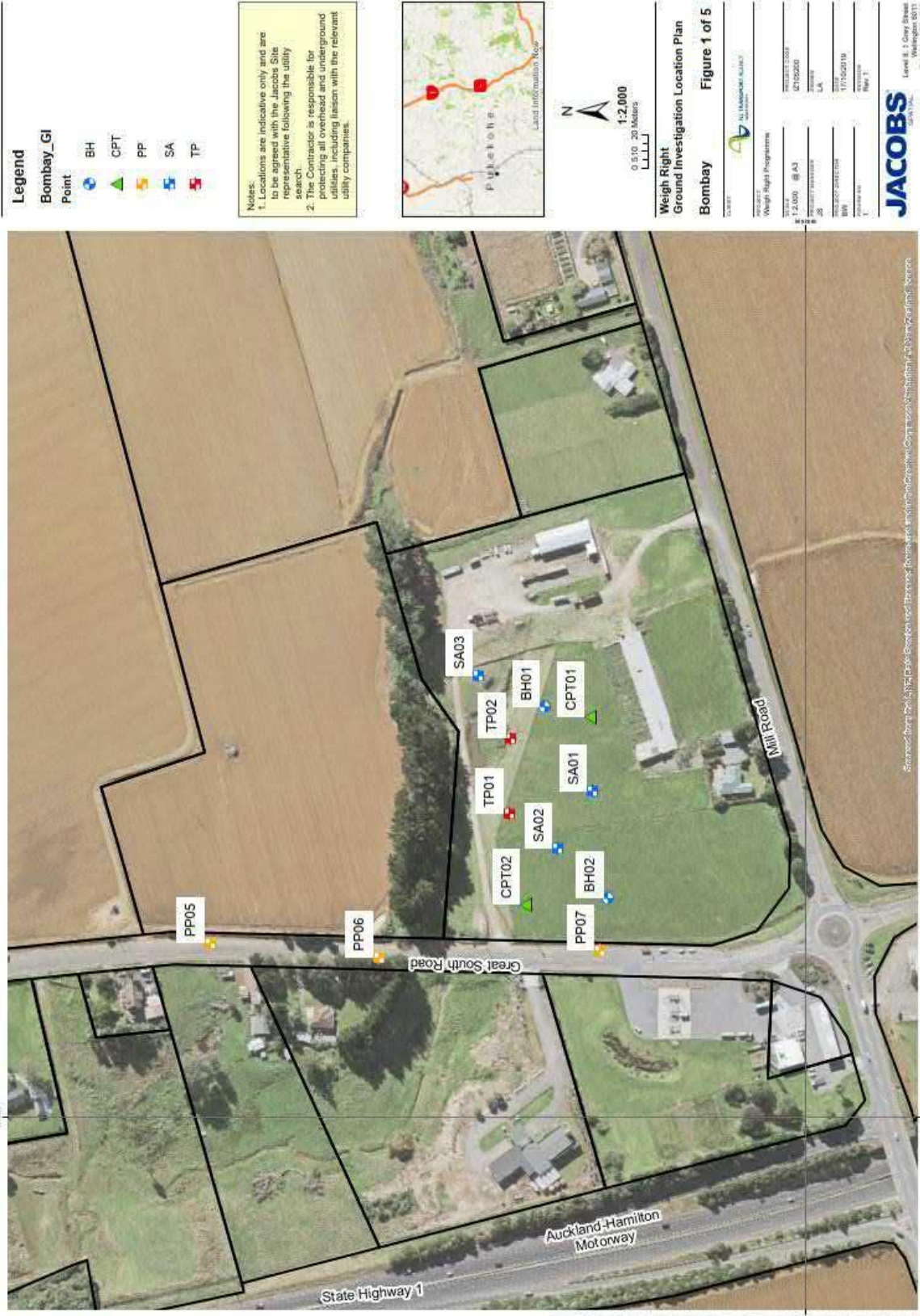


Figure 1.2: Soil sampling locations

Appendix B. High level PSI

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Subject	High-Level Contaminated Land Assessment - Bombay	Project Name	Weigh Right Programme
Attention	Graham Taylor (NZTA)	Project No.	IZ105201
From	George Hampton		
Date	18 September 2019		
Copies to	Kevin Tearney & Louis Bargh		

1. Introduction

New Zealand Transport Agency (NZTA) has engaged Jacobs New Zealand Limited (Jacobs) to prepare a high-level desktop assessment to identify whether any HAIL¹ activities are likely to have been undertaken on-site at their proposed new weigh station facility at 253 Mill Road, Bombay, located adjacent to the intersection of Great South Road and Mill Road (Appendix A). The land parcel on which the proposed weigh station facility is located is legally described as Lot 1 DP 124783.

This memo, which has been prepared in accordance with the proposal submitted to NZTA on 12 July 2019, summarises the findings of the high-level desktop assessment.

2. Review of Available Information

2.1 Council Site Records

Auckland Council maintains a database which identifies land parcels within Auckland Council's jurisdiction where hazardous activities and industries have been located. An email enquiry was sent by Jacobs to the Environmental Health Unit of the Licensing and Compliance Services Department (EHU LCSD) at Auckland Council on 8 August 2019 enquiring as to whether there were any council records or other information that indicates that the site is a HAIL site or potentially a HAIL site.

The EHU LCSD responded by email on the 9 August 2019 and noted the following:

- There is no contamination information held by LCSD for the site at 253 Mill Road, Bombay. However, there is potential for the site to have been subject to storage and/or use of chemicals and pesticides from possible horticultural or poultry operations; and
- Historical aerial imagery on Auckland Council's GeoMaps shows the possible stockpiling of waste/construction material to the north of the sheds located in close proximity to the eastern boundary of the site.

2.2 Historical Aerial Imagery

A review of historical aerial imagery from Retrolens (<http://retrolens.nz/>), Auckland Council GeoMaps (<https://geomapspublic.aucklandcouncil.govt.nz/viewer/index.html>) and Google Earth was undertaken

¹ Hazardous Activities and Industries List (<http://www.mfe.govt.nz/land/hazardous-activities-and-industries-list-hail>)

on 8 August 2019 to identify historic land uses and the potential for associated soil contamination. A summary of the review of historic aerial imagery is provided in Table 1.

Table 1 : Summary of land use at the site and in the surrounding area since 1942.

Year	Source	Comments
1942	Retrolens	Western half of the site appears to be in pastoral grass. Eastern half of the site appears to comprise a mixture of land uses including pastoral grass, a residential dwelling, multiple farm sheds and the storage of various materials. Surrounding land uses include pastoral grass and an ephemeral stream to the north and east, Mill Road to the south and Great South Road to the west.
1960	Retrolens	Horticultural crops appear to have been planted on the western half of the site. One of the farm sheds in the eastern half of the site appears to be dilapidated. Horticultural crops also appear to have been planted to the north of the site.
1961	Retrolens	Horticultural crops appear to have been planted to the east of the residential dwelling and farm sheds in the eastern half of the site. No apparent material change surrounding the site.
1963	Retrolens	No apparent material change at the site or in the surrounding area.
1971	Retrolens	A residential dwelling, a farm shed and a barn, possibly used to support a commercial poultry operation, have been constructed on the western half of the site. Remainder of the western half of the site appears to now be in pastoral grass. Dilapidated farm shed that was present in the eastern half of the site has been demolished. No apparent material change surrounding the site.
1974	Retrolens	Three small structures appear to have been constructed adjacent to the long barn in the western half of the site. Some paddocks in the western half the site appear to have been planted in horticultural crops. No apparent material change in the surrounding area.
1975	Retrolens	No apparent material change in the western half of the site. Residential dwelling and farm sheds that were present on the eastern half of the site have been demolished. Earthworks have been undertaken in the eastern half of the site and the ephemeral stream to the north and east of the site. No indication that horticultural crops are still present in the eastern half of the site.
1978	Retrolens	Two barns with a structure between them, possibly used to support a commercial poultry operation, have been constructed where the residential dwelling and farm buildings were present in the eastern half of the site. All paddocks in the western half of the site appear to have been planted in horticultural crops. No apparent material change in the surrounding area.
1979	Retrolens	Additional farm shed has been constructed to the north of the two barns in the eastern half of the site.
1981	Retrolens	Areas that were planted in horticultural crops appears to have been returned to pastoral grass. Barn has been constructed on land to the east of the site.
1988	Retrolens	No apparent material change at the site. Residential dwelling and additional barn have been constructed on land to the east of the site.

Year	Source	Comments
2001	Google Earth	Additional building, likely a farm shed, has been constructed to the northwest of the farm barn located in the western half of the site. Additional residential dwelling has been constructed on land to the east of the site.
2003 & 2004	GeoMaps	Farm shed that was present to the north of the two barns in the eastern half of the site has been demolished. No apparent material change in the surrounding area.
2006	GeoMaps	No apparent material change at the site or in the surrounding area.
2008	GeoMaps	A small portion of the site immediately to the north of the barn in the western half of the site appears to be used for growing vegetable crops. Waste or construction material appears to be stockpiled to the north of the barn in the eastern half of the site. No apparent material change in the surrounding area.
2010 & 2011	GeoMaps	Two small structures have been constructed between the two barns in the eastern half of the site. Stockpiled waste or construction material is no longer present at the site. No apparent material change in the surrounding area.
2013	Google Earth	Two small structures that were located between the two barns in the eastern half of the site have been moved are now located to the north of the two barns. No apparent material change in the surrounding area.
2014	Google Earth	One of the two small farm sheds located to the north of the of the two barns in the eastern half of the site has been demolished. No apparent material change in the surrounding area.
2015 & 2016	GeoMaps	The remaining small farm shed located to the north of the of the two barns in the eastern half of the site has been demolished. Accessway way from the western boundary of the site to the farm in the eastern half of the site has been constructed. Multiple trucks appear to be present at the site. No apparent material change in the surrounding area.
2017	GeoMaps	No apparent material change at the site or in the surrounding area.

3. Conclusion

The main findings of this high-level assessment are as follows:

- A review of information provided by Auckland Council's EHU LCSD and historical aerial imagery has indicated that:
 - The site has possibly been subject to the storage and/or use of chemicals and pesticides from horticultural or poultry operations; and
 - The age of some of the buildings that are currently on-site mean that it is possible that asbestos containing materials may have been used during construction of the buildings.
- The site is therefore likely to be a HAIL site under Category A10 which relates to the bulk storage or use of persistent pesticides, given the land has been used for horticultural and poultry activities at various periods since at least 1960 and;
- In relation to disturbing soil, a discretionary consent under Regulation 11 of the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS) is likely to be required given the

volume of soil excavated during the works will likely exceed the permitted activity threshold and a detailed site investigation (DSI) does not currently exist for the site;

- In relation to changing the use of the land, it is considered highly unlikely that human health will be impacted as a result of changing the use of the land from rural to commercial/industrial, and therefore consent is not required under the NESCS for this activity; and
- A discretionary consent under Activity A7 of Section E30 of the Auckland Unitary Plan Operative in Part is likely to be required given the likely volume of soil excavated during the works will likely exceed the permitted activity threshold and a DSI does not exist for the site.

Based on the main findings, the following is recommended:

- A detailed site investigation (DSI) is undertaken at the site to characterise contaminant concentrations where soil is to be disturbed as a result of the works; and
- Following completion of the DSI, a Contaminated Land Management Plan (CLMP) is developed to manage contaminated soils and protect human health during the works.

4. Limitations

This sole purposed of this memo prepared by Jacobs for the NZTA is to document the findings of a high-level desktop assessment undertaken to identify whether any HAIL activities are likely to have been undertaken on-site at their proposed new weigh station facility at 253 Mill Road, Bombay. The contents of this memo are in accordance with the scope of services detailed in the terms of engagement between Jacobs and NZTA. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this memo (or any part of it) for any other purpose.

In preparing this memo, Jacobs has relied upon, and presumed accurate, any information (or confirmation of the absence thereof) provided by the Client and/or from other sources. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that our observations and conclusions as expressed in this memo may change. Jacobs derived the data in this memo from information sourced from the Client (if any) and/or available in the public domain at the time or times outlined in this memo. The passage of time, manifestation of latent conditions or impacts of future events may require further examination of the project and subsequent data analysis, and re-evaluation of the data, findings, observations and conclusions expressed in this memo.

Jacobs has prepared this memo in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this memo. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this memo, to the extent permitted by law.

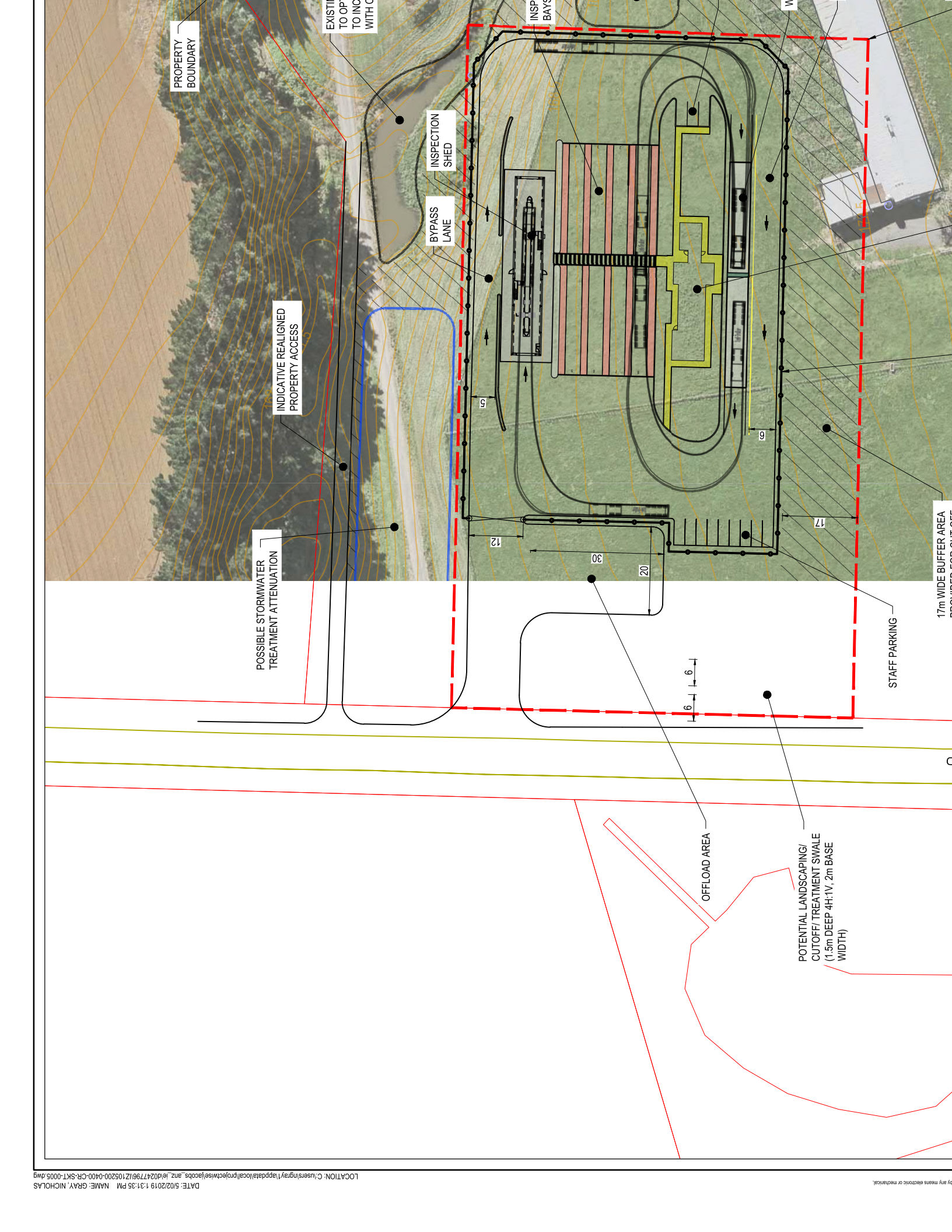
This memo may also describe specific limitations and/or uncertainties which qualify its findings. Accordingly, this memo should be read in full and no excerpts are to be taken as representative of the findings unless any such excerpt and the context in which it is intended to be used have been approved by Jacobs in writing.



Memorandum

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Appendix A



PROPERTY BOUNDARY

EXISTING TO OPERATE TO INCLUDE WITH C

INSPECTION SHED
BYPASS LANE

INSP BAYS

INDICATIVE REALIGNED PROPERTY ACCESS

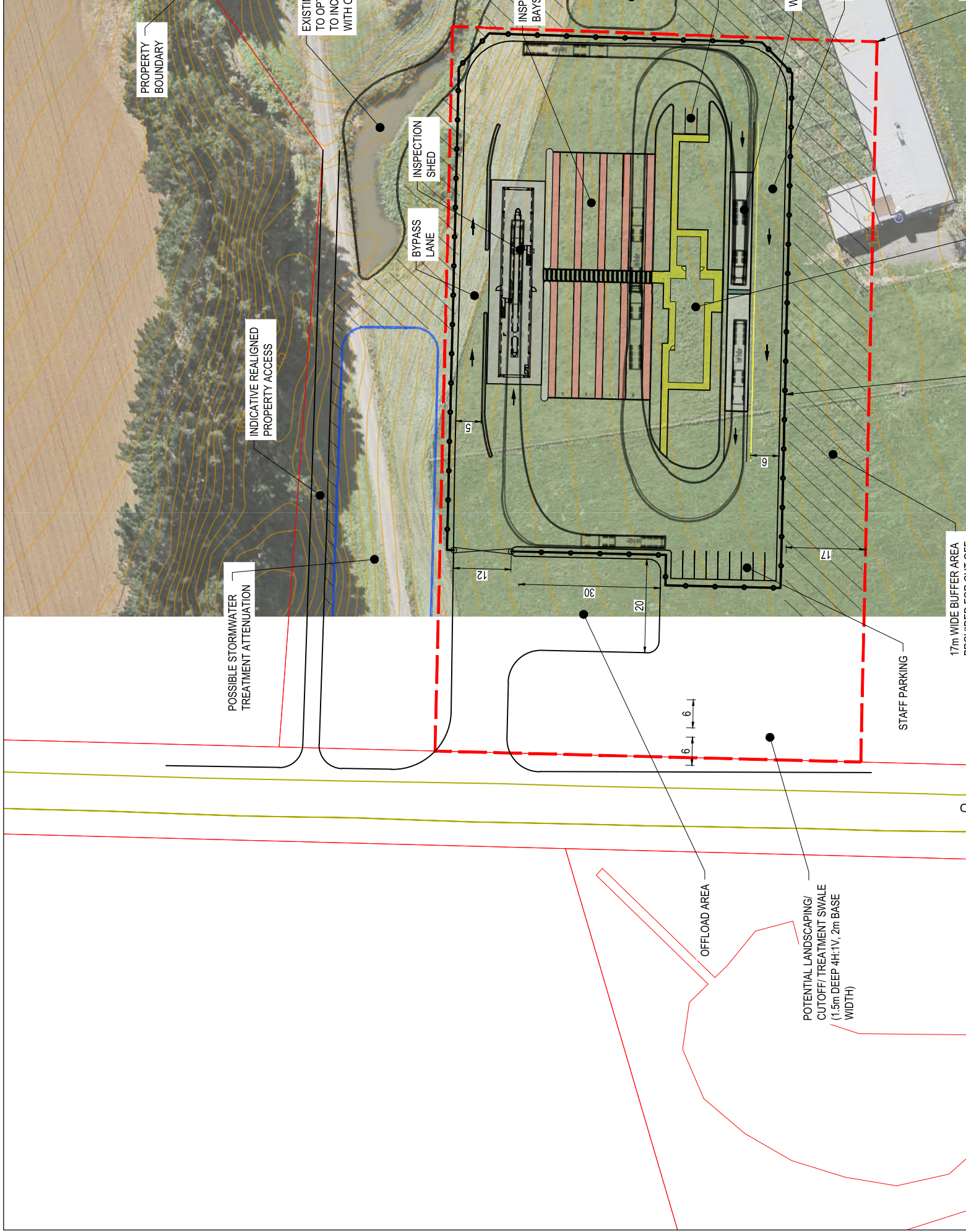
POSSIBLE STORMWATER TREATMENT ATTENUATION

STAFF PARKING

OFFLOAD AREA

POTENTIAL LANDSCAPING/CUTOFF/TREATMENT SWALE (1.5m DEEP 4H:1V, 2m BASE WIDTH)

17m WIDE BUFFER AREA



Appendix C. Test Pit Logs

Engineering Log - Excavation

SA01

Project: Weigh Right
Client: NZTA

Location: Bombay, Auckland

Page: 1 of 1
Project No: IZ105200

Contractor: McMillan Drilling (NI) Limited	Easting: 1776200.51	Elevation: 170.20	Started: 26/05/2020
Plant: Komatsu PC78MR	Northing: 5882131.30	Datum:	Finished: 26/05/2020
Logged By: MAFB Checked By: CR	Grid: NZGD2000 / New Zealand Transverse Mercator 2000	Inclination: 90°	Orientation: 0

EXCAVATION INFORMATION

MATERIAL SUBSTANCE

Method	Groundwater Levels	Samples	RL (m)	Depth (m)	Graphic	Material Description SOIL TYPE: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture	Consistency	Relative Density	Depth (m)	DCP (blows/100mm)	Field Test Data & Other Observations
		ES	170.0	0.0		Clayey SAND, greyish brown, loose, dry, non plastic, trace rootlets.	D	L		0.1		TOPSOIL
				0.5		CLAY with trace sand, brownish orange, firm, moist, high plasticity, trace rootlets.				0.2		VOLCANIC DEPOSITS
		ES		169.5	0.5	0.6m no rootlets.	M	F		0.3		
		B & ES		166.5	1.0	1.0m end of test pit, target depth reached.				0.4		
			169.0	1.1						1.1		Excavation dry.
				1.5						1.5		
			168.5	1.6						1.6		
				2.0						2.0		
			168.0	2.1						2.1		
				2.5						2.5		
			167.5	2.6						2.6		
				3.0						3.0		
			167.0	3.1						3.1		
				3.5						3.5		
			166.5	3.6						3.6		
				3.7						3.7		
				3.8						3.8		
				3.9						3.9		

METHOD & SUPPORT	PENETRATION	GROUNDWATER	SAMPLES & FIELD TESTS	MOISTURE	DENSITY (N-value)	CONSISTENCY (SU) (N-value)
N Natural/Existing cutting E Excavator BH Backhoe Bucket B Bulldozer R Ripper	No resistance ranging to refusal	= Water level (during test pitting) = Water inflow	D Disturbed Sample HP Hand Penetrometer B Bulk Sample HV Hand Vane Shear SPT SPT Sample (P: Peak Su R: Residual Su) U Undisturbed Sample E Enviro Sample W Water Sample	D = Dry M = Moist W = Wet Wp = Plastic Limit Wl = Liquid Limit	VL Very Loose 0 - 4 L Loose 4 - 10 MD Medium Dense 10 - 30 D Dense 30 - 50 VD Very Dense 50 - 100	VS Very Soft < 12 kPa (0-2) S Soft 12 - 25 (2-4) F Firm 25 - 50 (4-8) St Stiff 50 - 100 (8-15) VSt Very Stiff 100 - 200 (15-30) H Hard > 200 kPa (>30)

This log was created for Jacobs' client. Jacobs accepts no responsibility for any reliance on this information by third parties.

Engineering Log - Excavation

SA02

Project: Weigh Right
Client: NZTA

Location: Bombay, Auckland

Page: 1 of 1
Project No: IZ105200

Contractor: Higgins Contractors Limited	Easting: 1776165.19	Elevation: 169.03	Started: 26/05/2020
Plant: Komatsu PC78MR	Northing: 5882152.67	Datum:	Finished: 26/05/2020
Logged By: MAFB Checked By: CR	Grid: NZGD2000 / New Zealand Transverse Mercator 2000	Inclination: 90°	Orientation: 0

EXCAVATION INFORMATION				MATERIAL SUBSTANCE								
Method	Groundwater Levels	Samples	RL (m)	Depth (m)	Graphic	Material Description SOIL TYPE: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture	Consistency Relative Density	Depth (m)	DCP (blows/100mm)	Field Test Data & Other Observations	
E		ES	169.0			SAND with clay, greyish brown, loose, dry, non plastic, minor rootlets.	D	L	0.1		TOPSOIL	
									0.2			
									0.3		VOLCANIC DEPOSITS	
			ES	168.5	0.5		CLAY with trace sand, orange, soft to firm, dry to moist, medium plasticity.			0.4		
									0.5			
									0.6			
									0.7			
									0.8			
			ES	168.0	1.0			D-M	S-F	0.9		
										1.0		
									1.1			
									1.2			
									1.3			
									1.4			
		B	167.5	1.5		1.5m end of test pit, terminated by Engineer.			1.5		Excavation dry.	
									1.6			
									1.7			
									1.8			
									1.9			
									2.0			
									2.1			
									2.2			
									2.3			
									2.4			
									2.5			
									2.6			
									2.7			
									2.8			
									2.9			
									3.0			
									3.1			
									3.2			
									3.3			
									3.4			
									3.5			
									3.6			
									3.7			
									3.8			
									3.9			

METHOD & SUPPORT	PENETRATION	GROUNDWATER	SAMPLES & FIELD TESTS	MOISTURE	DENSITY (N-value)	CONSISTENCY (SU) (N-value)
N Natural/Existing cutting E Excavator BH Backhoe Bucket B Bulldozer R Ripper	No resistance ranging to refusal	= Water level (during test pitting) = Water inflow	D Disturbed Sample HP Hand Penetrometer B Bulk Sample HV Hand Vane Shear SPT SPT Sample (P: Peak Su R: Residual Su) U Undisturbed Sample E Enviro Sample W Water Sample	D = Dry M = Moist W = Wet Wp = Plastic Limit Wl = Liquid Limit	VL Very Loose 0 - 4 L Loose 4 - 10 MD Medium Dense 10 - 30 D Dense 30 - 50 VD Very Dense 50 - 100	VS Very Soft < 12 kPa (0-2) S Soft 12 - 25 (2-4) F Firm 25 - 50 (4-8) St Stiff 50 - 100 (8-15) VSt Very Stiff 100 - 200 (15-30) H Hard > 200 kPa (>30)

Engineering Log - Excavation

SA03

Project: Weigh Right
Client: NZTA

Location: Bombay, Auckland

Page: 1 of 1
Project No: IZ105200

Contractor: Higgins Contractors Limited	Easting: 1776271.55	Elevation: 166.51	Started: 26/05/2020
Plant: Komatsu PC78MR	Northing: 5882201.37	Datum:	Finished: 26/05/2020
Logged By: MAFB Checked By: CR	Grid: NZGD2000 / New Zealand Transverse Mercator 2000	Inclination: 90°	Orientation: 0

EXCAVATION INFORMATION

MATERIAL SUBSTANCE

Method	Groundwater Levels	Samples	RL (m)	Depth (m)	Graphic	Material Description SOIL TYPE: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture	Consistency	Relative Density	Depth (m)	DCP (blows/100mm)	Field Test Data & Other Observations
W		ES				SAND with some clay, greyish brown, loose, dry, non plastic, trace rootlets.	D	L		0.1		TOPSOIL
						CLAY with some sand, brownish orange, firm to stiff, dry to moist, non plastic.				0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9		VOLCANIC DEPOSITS
		ES	166.0	0.5			D-M	F-St				
		B & ES	165.5	1.0								Excavation dry.
				1.5								
				2.0								
				2.5								
				3.0								
				3.5								
				3.6								
				3.7								
				3.8								
				3.9								

METHOD & SUPPORT	PENETRATION	GROUNDWATER	SAMPLES & FIELD TESTS	MOISTURE	DENSITY (N-value)	CONSISTENCY (SU) (N-value)
N Natural/Existing cutting E Excavator BH Backhoe Bucket B Bulldozer R Ripper	No resistance ranging to refusal	= Water level (during test pitting) = Water inflow	D Disturbed Sample HP Hand Penetrometer B Bulk Sample HV Hand Vane Shear SPT SPT Sample (P: Peak Su R: Residual Su) U Undisturbed Sample E Enviro Sample W Water Sample	D = Dry M = Moist W = Wet Wp = Plastic Limit Wl = Liquid Limit	VL Very Loose 0 - 4 L Loose 4 - 10 MD Medium Dense 10 - 30 D Dense 30 - 50 VD Very Dense 50 - 100	VS Very Soft < 12 kPa (0-2) S Soft 12 - 25 (2-4) F Firm 25 - 50 (4-8) St Stiff 50 - 100 (8-15) VSt Very Stiff 100 - 200 (15-30) H Hard > 200 kPa (>30)

Engineering Log - Excavation

TP01

Project: Weigh Right
Client: NZTA

Location: Bombay, Auckland

Page: 1 of 1
Project No: IZ105200

Contractor: Higgins Contractors Limited	Easting: 1776186.75	Elevation: 167.24	Started: 02/06/2020
Plant: CAT 305 CR	Northing: 5882182.63	Datum:	Finished: 02/06/2020
Logged By: MAFB Checked By: CR	Grid: NZGD2000 / New Zealand Transverse Mercator 2000	Inclination: 90°	Orientation: 90

EXCAVATION INFORMATION	MATERIAL SUBSTANCE
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Method	Groundwater Levels	Samples	RL (m)	Depth (m)	Graphic	Material Description SOIL TYPE: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture	Consistency	Relative Density	Depth (m)	DCP (blows/100mm)	Field Test Data & Other Observations
W		ES	167.0	0.5		CLAYEY SAND, greyish brown, loose, dry to moist, non plastic, trace rootlets.	D-M	L		0.1		TOPSOIL
						CLAYEY SAND, orange, loose to medium dense, dry, non plastic.					0.2	
		ES	166.5			SANDY CLAY, orange, firm, dry to moist, high plasticity.		L- MD		0.3		RESIDUAL SOIL
										0.4		RESIDUAL SOIL
										0.5		RESIDUAL SOIL
										0.6		RESIDUAL SOIL
										0.7		RESIDUAL SOIL
										0.8		VOLCANIC DEPOSITS
										0.9		VOLCANIC DEPOSITS
			ES	166.0	1.0						1.0	
										1.1		VOLCANIC DEPOSITS
										1.2		VOLCANIC DEPOSITS
										1.3		VOLCANIC DEPOSITS
										1.4		VOLCANIC DEPOSITS
										1.5		VOLCANIC DEPOSITS
										1.6		VOLCANIC DEPOSITS
										1.7		VOLCANIC DEPOSITS
										1.8		VOLCANIC DEPOSITS
										1.9		VOLCANIC DEPOSITS
										2.0		VOLCANIC DEPOSITS
										2.1		VOLCANIC DEPOSITS
										2.2		VOLCANIC DEPOSITS
										2.3		VOLCANIC DEPOSITS
										2.4		VOLCANIC DEPOSITS
										2.5		VOLCANIC DEPOSITS
										2.6		VOLCANIC DEPOSITS
										2.7		VOLCANIC DEPOSITS
										2.8		VOLCANIC DEPOSITS
										2.9		VOLCANIC DEPOSITS
										3.0		VOLCANIC DEPOSITS
										3.1		Excavation dry.
										3.2		Excavation dry.
										3.3		Excavation dry.
										3.4		Excavation dry.
										3.5		Excavation dry.
										3.6		Excavation dry.
										3.7		Excavation dry.
										3.8		Excavation dry.
										3.9		Excavation dry.
										3.0		3.0m end of hole, target depth reached.
										3.0		Excavation dry.
										3.1		Excavation dry.
										3.2		Excavation dry.
										3.3		Excavation dry.
										3.4		Excavation dry.
										3.5		Excavation dry.
										3.6		Excavation dry.
										3.7		Excavation dry.
										3.8		Excavation dry.
										3.9		Excavation dry.

METHOD & SUPPORT	PENETRATION	GROUNDWATER	SAMPLES & FIELD TESTS	MOISTURE	DENSITY (N-value)	CONSISTENCY (SU) (N-value)
N Natural/Existing cutting E Excavator BH Backhoe Bucket B Bulldozer R Ripper	No resistance ranging to refusal	▽ = Water level (during test pitting) ▶ = Water inflow	D Disturbed Sample B Bulk Sample SPT SPT Sample U Undisturbed Sample E Enviro Sample W Water Sample HP Hand Penetrometer HV Hand Vane Shear (P: Peak Su R: Residual Su)	D = Dry M = Moist W = Wet Wp = Plastic Limit Wl = Liquid Limit	VL Very Loose 0 - 4 L Loose 4 - 10 MD Medium Dense 10 - 30 D Dense 30 - 50 VD Very Dense 50 - 100	VS Very Soft < 12 kPa (0-2) S Soft 12 - 25 (2-4) F Firm 25 - 50 (4-8) St Stiff 50 - 100 (8-15) VSt Very Stiff 100 - 200 (15-30) H Hard > 200 kPa (>30)

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Engineering Log - Excavation

TP02

Project: Weigh Right
Client: NZTA

Location: Bombay, Auckland

Page: 1 of 1
Project No: IZ105200

Contractor: Higgins Contractors Limited	Easting: 1776233.05	Elevation: 165.80	Started: 02/06/2020
Plant: CAT 305 CR	Northing: 5882181.30	Datum:	Finished: 02/06/2020
Logged By: MAFB Checked By: CR	Grid: NZGD2000 / New Zealand Transverse Mercator 2000	Inclination: 90°	Orientation: 0

EXCAVATION INFORMATION

MATERIAL SUBSTANCE

Method	Groundwater Levels	Samples	RL (m)	Depth (m)	Graphic	Material Description SOIL TYPE: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture	Consistency	Relative Density	Depth (m)	DCP (blows/100mm)				Field Test Data & Other Observations
											8	10	15	20	
W		ES				SAND with some clay, greyish brown, loose, dry, non plastic, minor rootlets.				0.1				TOPSOIL	
				165.5						0.2					
			ES		0.5					0.3					
										0.4					
										0.5					
										0.6					
										0.7					
							SANDY CLAY, red brown, firm, dry, high plasticity.				0.8				VOLCANIC DEPOSITS
			ES		1.0						0.9				
											1.0				
										1.1					
						CLAY with some sand and trace silt, orange spotted black, stiff, dry, non plastic.				1.2				VOLCANIC DEPOSITS	
										1.3					
										1.4					
										1.5					
										1.6					
										1.7					
										1.8					
										1.9					
						2.0m to 2.1m black band, possibly ash.				2.0					
										2.1				VOLCANIC DEPOSITS	
										2.2					
										2.3					
										2.4					
										2.5					
										2.6					
										2.7					
										2.8					
										2.9					
						CLAY with fine sand, blackish brown, very stiff, dry, non plastic. Sand volcanoclastic.				3.0					
										3.1				Excavation dry.	
										3.2					
										3.3					
										3.4					
										3.5					
										3.6					
										3.7					
										3.8					
										3.9					

METHOD & SUPPORT N Natural/Existing cutting E Excavator BH Backhoe Bucket B Bulldozer R Ripper	PENETRATION No resistance ranging to refusal ▽ = Water level (during test pitting) ► = Water inflow	GROUNDWATER	SAMPLES & FIELD TESTS D Disturbed Sample HP Hand Penetrometer B Bulk Sample HV Hand Vane Shear SPT SPT Sample (P: Peak Su R: Residual Su) U Undisturbed Sample E Enviro Sample W Water Sample	MOISTURE D = Dry M = Moist W = Wet Wp = Plastic Limit Wl = Liquid Limit	DENSITY (N-value) VL Very Loose 0 - 4 L Loose 4 - 10 MD Medium Dense 10 - 30 D Dense 30 - 50 VD Very Dense 50 - 100	CONSISTENCY (SU) (N-value) VS Very Soft < 12 kPa (0-2) S Soft 12 - 25 (2-4) F Firm 25 - 50 (4-8) St Stiff 50 - 100 (8-15) VSt Very Stiff 100 - 200 (15-30) H Hard > 200 kPa (>30)
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Appendix D. Photographs



Photograph 1: Facing northeast from the northern side of the site with the location of TP01 in the foreground



Photograph 2: The soil profile of SA01



Photograph 3: Facing west from the site of SA01, the brownish orange clay from SA01 in the foreground



Photograph 4: Facing northwest across the site from the site of SA02



Photograph 5: Facing northwest across the site from the site of SA03



Photograph 6: The soil profile at SA03



Photograph 7: Facing southwest across the site from the northeastern corner of the site



Photograph 8: Facing south across the site from the northeastern corner of the site



Photograph 9: Facing east across the site from the location of SA02



Photograph 10: Facing west across the northern extent of the site towards Great South Road

Appendix E. Chain of Custody and Laboratory Reports as Received



Certificate of Analysis

Client:	Jacobs New Zealand Limited	Lab No:	2375710	SPV1
Contact:	George Hampton C/- Jacobs New Zealand Limited PO Box 10283 The Terrace Wellington 6143	Date Received:	29-May-2020	
		Date Reported:	08-Jun-2020	
		Quote No:	104761	
		Order No:	IZ105201	
		Client Reference:	IZ105201	
		Add. Client Ref:	Sampled: 26/05/2020	
		Submitted By:	Max Blakemore	

Sample Type: Soil

Sample Name:	SA01 - 0.10 26-May-2020 9:00 am	SA01 - 0.50 26-May-2020 9:10 am	SA02 - 0.10 26-May-2020 9:50 am	SA02 - 0.50 26-May-2020 9:55 am	SA03 - 0.10 26-May-2020 10:45 am
Lab Number:	2375710.1	2375710.2	2375710.4	2375710.5	2375710.7

Individual Tests

Dry Matter	g/100g as rcvd	69	65	69	68	63
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Heavy Metals, Screen Level

Total Recoverable Arsenic	mg/kg dry wt	10	8	10	8	20
Total Recoverable Cadmium	mg/kg dry wt	0.23	< 0.10	0.27	< 0.10	0.15
Total Recoverable Chromium	mg/kg dry wt	22	25	21	22	32
Total Recoverable Copper	mg/kg dry wt	44	33	46	40	54
Total Recoverable Lead	mg/kg dry wt	44	23	44	31	50
Total Recoverable Nickel	mg/kg dry wt	8	8	8	8	17
Total Recoverable Zinc	mg/kg dry wt	109	40	106	42	200

Organochlorine Pesticides Screening in Soil

Aldrin	mg/kg dry wt	< 0.015	< 0.016	< 0.014	< 0.015	< 0.016
alpha-BHC	mg/kg dry wt	< 0.015	< 0.016	< 0.014	< 0.015	< 0.016
beta-BHC	mg/kg dry wt	< 0.015	< 0.016	< 0.014	< 0.015	< 0.016
delta-BHC	mg/kg dry wt	< 0.015	< 0.016	< 0.014	< 0.015	< 0.016
gamma-BHC (Lindane)	mg/kg dry wt	< 0.015	< 0.016	< 0.014	< 0.015	< 0.016
cis-Chlordane	mg/kg dry wt	< 0.015	< 0.016	< 0.014	< 0.015	< 0.016
trans-Chlordane	mg/kg dry wt	< 0.015	< 0.016	< 0.014	< 0.015	< 0.016
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
2,4'-DDD	mg/kg dry wt	< 0.015	< 0.016	< 0.014	< 0.015	< 0.016
4,4'-DDD	mg/kg dry wt	< 0.015	< 0.016	< 0.014	< 0.015	< 0.016
2,4'-DDE	mg/kg dry wt	< 0.015	< 0.016	< 0.014	< 0.015	< 0.016
4,4'-DDE	mg/kg dry wt	< 0.015	< 0.016	< 0.014	< 0.015	< 0.016
2,4'-DDT	mg/kg dry wt	< 0.015	< 0.016	< 0.014	< 0.015	< 0.016
4,4'-DDT	mg/kg dry wt	< 0.015	< 0.016	< 0.014	< 0.015	< 0.016
Total DDT Isomers	mg/kg dry wt	< 0.09	< 0.10	< 0.09	< 0.09	< 0.10
Dieldrin	mg/kg dry wt	< 0.015	< 0.016	< 0.014	< 0.015	< 0.016
Endosulfan I	mg/kg dry wt	< 0.015	< 0.016	< 0.014	< 0.015	< 0.016
Endosulfan II	mg/kg dry wt	< 0.015	< 0.016	< 0.014	< 0.015	< 0.016
Endosulfan sulphate	mg/kg dry wt	< 0.015	< 0.016	< 0.014	< 0.015	< 0.016
Endrin	mg/kg dry wt	< 0.015	< 0.016	< 0.014	< 0.015	< 0.016
Endrin aldehyde	mg/kg dry wt	< 0.015	< 0.016	< 0.014	< 0.015	< 0.016
Endrin ketone	mg/kg dry wt	< 0.015	< 0.016	< 0.014	< 0.015	< 0.016
Heptachlor	mg/kg dry wt	< 0.015	< 0.016	< 0.014	< 0.015	< 0.016
Heptachlor epoxide	mg/kg dry wt	< 0.015	< 0.016	< 0.014	< 0.015	< 0.016
Hexachlorobenzene	mg/kg dry wt	< 0.015	< 0.016	< 0.014	< 0.015	< 0.016
Methoxychlor	mg/kg dry wt	< 0.015	< 0.016	< 0.014	< 0.015	< 0.016



Sample Type: Soil

Sample Name:	SA01 - 0.10 26-May-2020 9:00 am	SA01 - 0.50 26-May-2020 9:10 am	SA02 - 0.10 26-May-2020 9:50 am	SA02 - 0.50 26-May-2020 9:55 am	SA03 - 0.10 26-May-2020 10:45 am
Lab Number:	2375710.1	2375710.2	2375710.4	2375710.5	2375710.7

Organonitro&phosphorus Pesticides Screen in Soil by GCMS

Acetochlor	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Alachlor	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Atrazine	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Atrazine-desethyl	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Atrazine-desisopropyl	mg/kg	< 0.14	< 0.15	< 0.14	< 0.14	< 0.16
Azaconazole	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
Azinphos-methyl	mg/kg	< 0.14	< 0.15	< 0.14	< 0.14	< 0.16
Benalaxyl	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
Bitertanol	mg/kg	< 0.14	< 0.15	< 0.14	< 0.14	< 0.16
Bromacil	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Bromopropylate	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Butachlor	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Captan	mg/kg	< 0.14	< 0.15	< 0.14	< 0.14	< 0.16
Carbaryl	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Carbofuran	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Chlorfluazuron	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Chlorothalonil	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Chlorpyrifos	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Chlorpyrifos-methyl	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Chlortoluron	mg/kg	< 0.14	< 0.15	< 0.14	< 0.14	< 0.16
Cyanazine	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Cyfluthrin	mg/kg	< 0.09	< 0.09	< 0.09	< 0.09	< 0.10
Cyhalothrin	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Cypermethrin	mg/kg	< 0.17	< 0.18	< 0.17	< 0.17	< 0.19
Deltamethrin (including Tralomethrin)	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Diazinon	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
Dichlofluanid	mg/kg	< 0.14	< 0.15	< 0.14	< 0.14	< 0.16
Dichloran	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	mg/kg	< 0.09	< 0.09	< 0.09	< 0.09	< 0.09
Difenoconazole	mg/kg	< 0.10	< 0.11	< 0.10	< 0.10	< 0.11
Dimethoate	mg/kg	< 0.14	< 0.15	< 0.14	< 0.14	< 0.16
Diphenylamine	mg/kg	< 0.14	< 0.15	< 0.14	< 0.14	< 0.16
Diuron	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Fenpropimorph	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Fluazifop-butyl	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Fluometuron	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Flusilazole	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Fluvalinate	mg/kg	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06
Furalaxyl	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
Haloxfop-methyl	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Hexaconazole	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Hexazinone	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
IPBC (3-Iodo-2-propynyl-n-butylcarbamate)	mg/kg dry wt	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Kresoxim-methyl	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
Linuron	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Malathion	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Metalaxyl (Mefenoxam)	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Methamidophos	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Metolachlor	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Metribuzin	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Molinate	mg/kg	< 0.14	< 0.15	< 0.14	< 0.14	< 0.16
Myclobutanil	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Naled	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Norflurazon	mg/kg	< 0.14	< 0.15	< 0.14	< 0.14	< 0.16

Sample Type: Soil						
Sample Name:	SA01 - 0.10 26-May-2020 9:00 am	SA01 - 0.50 26-May-2020 9:10 am	SA02 - 0.10 26-May-2020 9:50 am	SA02 - 0.50 26-May-2020 9:55 am	SA03 - 0.10 26-May-2020 10:45 am	
Lab Number:	2375710.1	2375710.2	2375710.4	2375710.5	2375710.7	
Organonitro&phosphorus Pesticides Screen in Soil by GCMS						
Oxadiazon	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Oxyfluorfen	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
Paclobutrazol	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Parathion-ethyl	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Parathion-methyl	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Pendimethalin	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Permethrin	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Pirimicarb	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Pirimiphos-methyl	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Prochloraz	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Procymidone	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Prometryn	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
Propachlor	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Propanil	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Propazine	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
Propiconazole	mg/kg	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06
Pyriproxyfen	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Quizalofop-ethyl	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Simazine	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Simetryn	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Sulfentrazone	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
TCMTB [2-(thiocyanomethylthio) benzothiazole, Busan]	mg/kg dry wt	< 0.14	< 0.15	< 0.14	< 0.14	< 0.16
Tebuconazole	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Terbacil	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Terbufos	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Terbumeton	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Terbuthylazine	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
Terbuthylazine-desethyl	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Terbutryn	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Thiabendazole	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Thiobencarb	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Tolyfluanid	mg/kg	< 0.14	< 0.15	< 0.14	< 0.14	< 0.16
Triazophos	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Trifluralin	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Vinclozolin	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	< 0.08
Sample Name:	SA03 - 0.50 26-May-2020 10:50 am					
Lab Number:	2375710.8					
Individual Tests						
Dry Matter	g/100g as rcvd	63	-	-	-	-
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	5	-	-	-	-
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	-	-	-	-
Total Recoverable Chromium	mg/kg dry wt	33	-	-	-	-
Total Recoverable Copper	mg/kg dry wt	30	-	-	-	-
Total Recoverable Lead	mg/kg dry wt	19.3	-	-	-	-
Total Recoverable Nickel	mg/kg dry wt	10	-	-	-	-
Total Recoverable Zinc	mg/kg dry wt	28	-	-	-	-
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.016	-	-	-	-
alpha-BHC	mg/kg dry wt	< 0.016	-	-	-	-
beta-BHC	mg/kg dry wt	< 0.016	-	-	-	-

Sample Type: Soil

Sample Name:	SA03 - 0.50 26-May-2020 10:50 am				
Lab Number:	2375710.8				

Organochlorine Pesticides Screening in Soil

delta-BHC	mg/kg dry wt	< 0.016	-	-	-	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.016	-	-	-	-
cis-Chlordane	mg/kg dry wt	< 0.016	-	-	-	-
trans-Chlordane	mg/kg dry wt	< 0.016	-	-	-	-
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	-	-	-	-
2,4'-DDD	mg/kg dry wt	< 0.016	-	-	-	-
4,4'-DDD	mg/kg dry wt	< 0.016	-	-	-	-
2,4'-DDE	mg/kg dry wt	< 0.016	-	-	-	-
4,4'-DDE	mg/kg dry wt	< 0.016	-	-	-	-
2,4'-DDT	mg/kg dry wt	< 0.016	-	-	-	-
4,4'-DDT	mg/kg dry wt	< 0.016	-	-	-	-
Total DDT Isomers	mg/kg dry wt	< 0.10	-	-	-	-
Dieldrin	mg/kg dry wt	< 0.016	-	-	-	-
Endosulfan I	mg/kg dry wt	< 0.016	-	-	-	-
Endosulfan II	mg/kg dry wt	< 0.016	-	-	-	-
Endosulfan sulphate	mg/kg dry wt	< 0.016	-	-	-	-
Endrin	mg/kg dry wt	< 0.016	-	-	-	-
Endrin aldehyde	mg/kg dry wt	< 0.016	-	-	-	-
Endrin ketone	mg/kg dry wt	< 0.016	-	-	-	-
Heptachlor	mg/kg dry wt	< 0.016	-	-	-	-
Heptachlor epoxide	mg/kg dry wt	< 0.016	-	-	-	-
Hexachlorobenzene	mg/kg dry wt	< 0.016	-	-	-	-
Methoxychlor	mg/kg dry wt	< 0.016	-	-	-	-

Organonitro&phosphorus Pesticides Screen in Soil by GCMS

Acetochlor	mg/kg	< 0.08	-	-	-	-
Alachlor	mg/kg	< 0.05	-	-	-	-
Atrazine	mg/kg	< 0.08	-	-	-	-
Atrazine-desethyl	mg/kg	< 0.08	-	-	-	-
Atrazine-desisopropyl	mg/kg	< 0.16	-	-	-	-
Azaconazole	mg/kg	< 0.04	-	-	-	-
Azinphos-methyl	mg/kg	< 0.16	-	-	-	-
Benalaxyl	mg/kg	< 0.04	-	-	-	-
Bitertanol	mg/kg	< 0.16	-	-	-	-
Bromacil	mg/kg	< 0.08	-	-	-	-
Bromopropylate	mg/kg	< 0.08	-	-	-	-
Butachlor	mg/kg	< 0.08	-	-	-	-
Captan	mg/kg	< 0.16	-	-	-	-
Carbaryl	mg/kg	< 0.08	-	-	-	-
Carbofuran	mg/kg	< 0.08	-	-	-	-
Chlorfluazuron	mg/kg	< 0.08	-	-	-	-
Chlorothalonil	mg/kg	< 0.08	-	-	-	-
Chlorpyrifos	mg/kg	< 0.08	-	-	-	-
Chlorpyrifos-methyl	mg/kg	< 0.08	-	-	-	-
Chlortoluron	mg/kg	< 0.16	-	-	-	-
Cyanazine	mg/kg	< 0.08	-	-	-	-
Cyfluthrin	mg/kg	< 0.10	-	-	-	-
Cyhalothrin	mg/kg	< 0.08	-	-	-	-
Cypermethrin	mg/kg	< 0.19	-	-	-	-
Deltamethrin (including Tralomethrin)	mg/kg	< 0.08	-	-	-	-
Diazinon	mg/kg	< 0.04	-	-	-	-
Dichlofluanid	mg/kg	< 0.16	-	-	-	-
Dichloran	mg/kg	< 0.2	-	-	-	-
Dichlorvos	mg/kg	< 0.09	-	-	-	-

Sample Type: Soil

Sample Name:	SA03 - 0.50 26-May-2020 10:50 am				
Lab Number:	2375710.8				

Organonitro&phosphorus Pesticides Screen in Soil by GCMS

Difenoconazole	mg/kg	< 0.11	-	-	-	-
Dimethoate	mg/kg	< 0.16	-	-	-	-
Diphenylamine	mg/kg	< 0.16	-	-	-	-
Diuron	mg/kg	< 0.08	-	-	-	-
Fenpropimorph	mg/kg	< 0.08	-	-	-	-
Fluazifop-butyl	mg/kg	< 0.08	-	-	-	-
Fluometuron	mg/kg	< 0.08	-	-	-	-
Flusilazole	mg/kg	< 0.08	-	-	-	-
Fluvalinate	mg/kg	< 0.06	-	-	-	-
Furalaxyl	mg/kg	< 0.04	-	-	-	-
Haloxfop-methyl	mg/kg	< 0.08	-	-	-	-
Hexaconazole	mg/kg	< 0.08	-	-	-	-
Hexazinone	mg/kg	< 0.04	-	-	-	-
IPBC (3-Iodo-2-propynyl-n-butylcarbamate)	mg/kg dry wt	< 0.4	-	-	-	-
Kresoxim-methyl	mg/kg	< 0.04	-	-	-	-
Linuron	mg/kg	< 0.4	-	-	-	-
Malathion	mg/kg	< 0.08	-	-	-	-
Metalaxyl (Mefenoxam)	mg/kg	< 0.08	-	-	-	-
Methamidophos	mg/kg	< 0.4	-	-	-	-
Metolachlor	mg/kg	< 0.05	-	-	-	-
Metribuzin	mg/kg	< 0.08	-	-	-	-
Molinate	mg/kg	< 0.16	-	-	-	-
Myclobutanil	mg/kg	< 0.08	-	-	-	-
Naled	mg/kg	< 0.4	-	-	-	-
Norflurazon	mg/kg	< 0.16	-	-	-	-
Oxadiazon	mg/kg	< 0.08	-	-	-	-
Oxyfluorfen	mg/kg	< 0.04	-	-	-	-
Paclobutrazol	mg/kg	< 0.08	-	-	-	-
Parathion-ethyl	mg/kg	< 0.08	-	-	-	-
Parathion-methyl	mg/kg	< 0.08	-	-	-	-
Pendimethalin	mg/kg	< 0.08	-	-	-	-
Permethrin	mg/kg	< 0.03	-	-	-	-
Pirimicarb	mg/kg	< 0.08	-	-	-	-
Pirimiphos-methyl	mg/kg	< 0.08	-	-	-	-
Prochloraz	mg/kg	< 0.4	-	-	-	-
Procymidone	mg/kg	< 0.08	-	-	-	-
Prometryn	mg/kg	< 0.04	-	-	-	-
Propachlor	mg/kg	< 0.08	-	-	-	-
Propanil	mg/kg	< 0.2	-	-	-	-
Propazine	mg/kg	< 0.04	-	-	-	-
Propiconazole	mg/kg	< 0.06	-	-	-	-
Pyriproxyfen	mg/kg	< 0.08	-	-	-	-
Quizalofop-ethyl	mg/kg	< 0.08	-	-	-	-
Simazine	mg/kg	< 0.08	-	-	-	-
Simetryn	mg/kg	< 0.08	-	-	-	-
Sulfentrazone	mg/kg	< 0.4	-	-	-	-
TCMTB [2-(thiocyanomethylthio) benzothiazole, Busan]	mg/kg dry wt	< 0.16	-	-	-	-
Tebuconazole	mg/kg	< 0.08	-	-	-	-
Terbacil	mg/kg	< 0.08	-	-	-	-
Terbufos	mg/kg	< 0.08	-	-	-	-
Terbumeton	mg/kg	< 0.08	-	-	-	-
Terbuthylazine	mg/kg	< 0.04	-	-	-	-
Terbuthylazine-desethyl	mg/kg	< 0.08	-	-	-	-

Sample Type: Soil

Sample Name:	SA03 - 0.50 26-May-2020 10:50 am				
Lab Number:	2375710.8				

Organonitro&phosphorus Pesticides Screen in Soil by GCMS

Terbutryn	mg/kg	< 0.08	-	-	-	-
Thiabendazole	mg/kg	< 0.4	-	-	-	-
Thiobencarb	mg/kg	< 0.08	-	-	-	-
Tolyfluanid	mg/kg	< 0.16	-	-	-	-
Triazophos	mg/kg	< 0.08	-	-	-	-
Trifluralin	mg/kg	< 0.08	-	-	-	-
Vinclozolin	mg/kg	< 0.08	-	-	-	-

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil

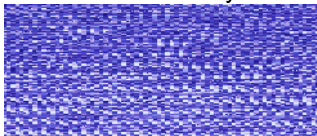
Test	Method Description	Default Detection Limit	Sample No
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1-2, 4-5, 7-8
Heavy Metals, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.10 - 4 mg/kg dry wt	1-2, 4-5, 7-8
Organochlorine/nitro&phosphorus Pest.s Screen in Soils, GCMS	Sonication extraction, Dilution cleanup, GC-MS analysis. Tested on as received sample.	-	1-2, 4-5, 7-8
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvcd	1-2, 4-5, 7-8

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Dates of testing are available on request. Please contact the laboratory for more information.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.



Carole Rodgers-Carroll BA, NZCS
Client Services Manager - Environmental



Certificate of Analysis

Page 1 of 3

Client:	Jacobs New Zealand Limited	Lab No:	2375916	A2Pv1
Contact:	George Hampton C/- Jacobs New Zealand Limited PO Box 10283 The Terrace Wellington 6143	Date Received:	29-May-2020	
		Date Reported:	03-Jun-2020	
		Quote No:	104761	
		Order No:	IZ 105201	
		Client Reference:	IZ105201	
		Add. Client Ref:	Sampled:26/05/2020	
		Submitted By:	Max Blakemore	

Sample Type: Soil						
Sample Name:		SA01-0.10	SA02-0.10	SA03-0.10		
Lab Number:		2375916.1	2375916.2	2375916.3		
Asbestos Presence / Absence*		Asbestos NOT detected.	Asbestos NOT detected.	Crocidolite (Blue Asbestos) detected.	-	-
Description of Asbestos Form*		-	-	Loose fibres (minor)	-	-
Asbestos in ACM as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	-	-
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	-	-
Asbestos as Fibrous Asbestos as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	-	-
Asbestos as Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	-	-
As Received Weight*	g	410.3	439.6	403.1	-	-
Dry Weight*	g	291.5	311.4	259.3	-	-
Moisture	%	29	29	36	-	-
Sample Fraction >10mm*	g dry wt	< 0.1	< 0.1	3.3	-	-
Sample Fraction <10mm to >2mm*	g dry wt	79.8	65.4	61.6	-	-
Sample Fraction <2mm*	g dry wt	210.8	244.9	194.4	-	-
<2mm Subsample Weight*	g dry wt	50.1	53.7	50.4	-	-
Weight of Asbestos in ACM (Non-Friable)*	g dry wt	< 0.00001	< 0.00001	< 0.00001	-	-
Weight of Asbestos as Fibrous Asbestos (Friable)*	g dry wt	< 0.00001	< 0.00001	< 0.00001	-	-
Weight of Asbestos as Asbestos Fines (Friable)*	g dry wt	< 0.00001	< 0.00001	0.00003	-	-



Glossary of Terms

- Loose fibres (Minor) - One or two fibres/fibre bundles identified during analysis by stereo microscope/PLM.
- Loose fibres (Major) - Three or more fibres/fibre bundles identified during analysis by stereo microscope/PLM.
- ACM Debris (Minor) - One or two small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
- ACM Debris (Major) - Large (>2mm) piece, or more than three small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
- Unknown Mineral Fibres - Mineral fibres of unknown type detected by polarised light microscopy including dispersion staining. The fibres detected may or may not be asbestos fibres. To confirm the identities, another independent analytical technique may be required.
- Trace - Trace levels of asbestos, as defined by AS4964-2004.

For further details, please contact the Asbestos Team.

Please refer to the **BRANZ New Zealand Guidelines for Assessing and Managing Asbestos in Soil**.

<https://www.branz.co.nz/asbestos>

The following assumptions have been made:

1. Asbestos Fines in the <2mm fraction, after homogenisation, is evenly distributed throughout the fraction
2. The weight of asbestos in the sample is unaffected by the ashing process.

Results are representative of the sample provided to Hill Laboratories only.

Analyst's Comments

Appendix No.1 - Chain of Custody

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil

Test	Method Description	Default Detection Limit	Sample No
New Zealand Guidelines Semi Quantitative Asbestos in Soil			
As Received Weight*	Measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g	1-3
Dry Weight*	Sample dried at 100 to 105°C, measurement on balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g	1-3
Moisture	Sample dried at 100 to 105°C. Calculation = (As received weight - Dry weight) / as received weight x 100.	1 %	1-3
Sample Fraction >10mm*	Sample dried at 100 to 105°C, 10mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g dry wt	1-3
Sample Fraction <10mm to >2mm*	Sample dried at 100 to 105°C, 10mm and 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g dry wt	1-3
Sample Fraction <2mm*	Sample dried at 100 to 105°C, 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g dry wt	1-3
Asbestos Presence / Absence*	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	-	1-3
Description of Asbestos Form*	Description of asbestos form and/or shape if present. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	-	1-3
Weight of Asbestos in ACM (Non-Friable)*	Measurement on analytical balance, from the >10mm Fraction. Weight of asbestos based on assessment of ACM form. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1-3
Asbestos in ACM as % of Total Sample*	Calculated from weight of asbestos in ACM and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-3
Weight of Asbestos as Fibrous Asbestos (Friable)*	Measurement on analytical balance, from the >10mm Fraction. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1-3
Asbestos as Fibrous Asbestos as % of Total Sample*	Calculated from weight of fibrous asbestos and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-3
Weight of Asbestos as Asbestos Fines (Friable)*	Measurement on analytical balance, from the <10mm Fractions. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1-3

Sample Type: Soil

Test	Method Description	Default Detection Limit	Sample No
Asbestos as Asbestos Fines as % of Total Sample*	Calculated from weight of asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-3
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	Calculated from weight of fibrous asbestos plus asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-3

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

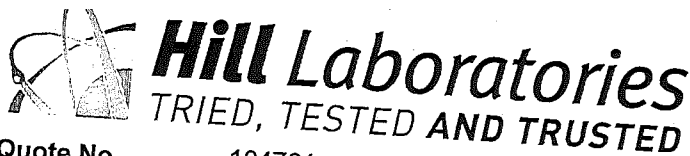
Dates of testing are available on request. Please contact the laboratory for more information.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.



Keith Benson HNC Chem
Laboratory Technician - Asbestos



ANALYSIS REQUEST

R J Hill Laboratories Limited
 28 Duke Street, Hamilton 3204
 Private Bag 3205
 Hamilton 3240, New Zealand

Job No: _____ Date Recv: 29-May-20 15:42

237 5916

Received by: Toni Darling

T 0508 HILL LAB (44 555 22)
 T +64 7 858 2000
 E mail@hill-labs.co.nz
 W www.hill-laboratories.com



Quote No 104761

Primary Contact George Hampton

Submitted By Max Blakemore

Client Name Jacobs New Zealand Limited

Address Level 8, 1 Grey Street
 Wellington Postcode 6011

Phone 04 914 8419 **Mobile** 027 349 1487

Email george.hampton@jacobs.com

Charge To Jacobs New Zealand Limited

Client Reference IZ105201

Order No IZ105201

Results To Reports will be emailed to Primary Contact by default.
 Additional Reports will be sent as specified below.

Email Primary Contact Email Submitter Email Client

Email Other

Other

CHAIN OF CUSTODY RECORD

Sent to Hill Laboratories

Date & Time: _____

Name: Max Blakemore

Tick if you require COC to be emailed back

Signature: _____

Received at Hill Laboratories

Date & Time: _____

Name: _____

Signature: _____

Condition

Room Temp Chilled Frozen

Temp: 18.1°C

Dates of testing are not routinely included in the Certificates of Analysis.
 Please inform the Laboratory if you would like this information reported.

ADDITIONAL INFORMATION / KNOWN HAZARDS

Priority Low Normal High

Urgent (ASAP, extra charge applies, please contact lab first)

Requested Reporting Date: _____

No.	Sample Name	Sample Date	Sample Time	Sample Type	Tests Required (if not as per Quote)
1	SA01-0.10	26 May 2020	09:00	Soil	As per quote # 104761
2	SA01-0.50	26 May 2020	09:10	Soil	As per quote # 104761 excluding asbestos
3	SA01-1.00	26 May 2020	09:20	Soil	Hold cold
4	SA02-0.10	26 May 2020	09:50	Soil	As per quote # 104761
5	SA02-0.50	26 May 2020	09:55	Soil	As per quote # 104761 excluding asbestos
6	SA02-1.00	26 May 2020	10:00	Soil	Hold cold
7	SA03-0.10	26 May 2020	10:45	Soil	As per quote # 104761
8	SA03-0.50	26 May 2020	10:50	Soil	As per quote # 104761 excluding asbestos
9	SA03-1.00	26 May 2020	11:00	Soil	Hold cold
10					
11					
12					



Certificate of Analysis

Client:	Jacobs New Zealand Limited	Lab No:	2377636	A2Pv1
Contact:	George Hampton C/- Jacobs New Zealand Limited PO Box 10283 The Terrace Wellington 6143	Date Received:	03-Jun-2020	
		Date Reported:	08-Jun-2020	
		Quote No:	104761	
		Order No:	IZ105201	
		Client Reference:	IZ105201	
		Add. Client Ref:	Sampled: 2.6.20	
		Submitted By:	Max Blakemore	

Sample Type: Soil					
Sample Name:	TP01 - 0.1m	TP02 - 0.1m			
Lab Number:	2377636.1	2377636.2			
Asbestos Presence / Absence*	Asbestos NOT detected.	Asbestos NOT detected.	-	-	-
Description of Asbestos Form*	-	-	-	-	-
Asbestos in ACM as % of Total Sample*	% w/w < 0.001	< 0.001	-	-	-
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	% w/w < 0.001	< 0.001	-	-	-
Asbestos as Fibrous Asbestos as % of Total Sample*	% w/w < 0.001	< 0.001	-	-	-
Asbestos as Asbestos Fines as % of Total Sample*	% w/w < 0.001	< 0.001	-	-	-
As Received Weight*	g 352.3	418.9	-	-	-
Dry Weight*	g 250.2	296.9	-	-	-
Moisture	% 29	29	-	-	-
Sample Fraction >10mm*	g dry wt < 0.1	4.8	-	-	-
Sample Fraction <10mm to >2mm*	g dry wt 54.2	44.6	-	-	-
Sample Fraction <2mm*	g dry wt 194.6	246.8	-	-	-
<2mm Subsample Weight*	g dry wt 52.8	51.4	-	-	-
Weight of Asbestos in ACM (Non-Friable)*	g dry wt < 0.00001	< 0.00001	-	-	-
Weight of Asbestos as Fibrous Asbestos (Friable)*	g dry wt < 0.00001	< 0.00001	-	-	-
Weight of Asbestos as Asbestos Fines (Friable)*	g dry wt < 0.00001	< 0.00001	-	-	-

Glossary of Terms

- Loose fibres (Minor) - One or two fibres/fibre bundles identified during analysis by stereo microscope/PLM.
- Loose fibres (Major) - Three or more fibres/fibre bundles identified during analysis by stereo microscope/PLM.
- ACM Debris (Minor) - One or two small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
- ACM Debris (Major) - Large (>2mm) piece, or more than three small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
- Unknown Mineral Fibres - Mineral fibres of unknown type detected by polarised light microscopy including dispersion staining. The fibres detected may or may not be asbestos fibres. To confirm the identities, another independent analytical technique may be required.
- Trace - Trace levels of asbestos, as defined by AS4964-2004.

For further details, please contact the Asbestos Team.

Please refer to the BRANZ New Zealand Guidelines for Assessing and Managing Asbestos in Soil.

<https://www.branz.co.nz/asbestos>

The following assumptions have been made:

1. Asbestos Fines in the <2mm fraction, after homogenisation, is evenly distributed throughout the fraction
2. The weight of asbestos in the sample is unaffected by the ashing process.

Results are representative of the sample provided to Hill Laboratories only.



Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Sample No
New Zealand Guidelines Semi Quantitative Asbestos in Soil			
As Received Weight*	Measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g	1-2
Dry Weight*	Sample dried at 100 to 105°C, measurement on balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g	1-2
Moisture	Sample dried at 100 to 105°C. Calculation = (As received weight - Dry weight) / as received weight x 100.	1 %	1-2
Sample Fraction >10mm*	Sample dried at 100 to 105°C, 10mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g dry wt	1-2
Sample Fraction <10mm to >2mm*	Sample dried at 100 to 105°C, 10mm and 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g dry wt	1-2
Sample Fraction <2mm*	Sample dried at 100 to 105°C, 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g dry wt	1-2
Asbestos Presence / Absence*	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	0.01%	1-2
Description of Asbestos Form*	Description of asbestos form and/or shape if present. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	-	1-2
Weight of Asbestos in ACM (Non-Friable)*	Measurement on analytical balance, from the >10mm Fraction. Weight of asbestos based on assessment of ACM form. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1-2
Asbestos in ACM as % of Total Sample*	Calculated from weight of asbestos in ACM and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-2
Weight of Asbestos as Fibrous Asbestos (Friable)*	Measurement on analytical balance, from the >10mm Fraction. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1-2
Asbestos as Fibrous Asbestos as % of Total Sample*	Calculated from weight of fibrous asbestos and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-2
Weight of Asbestos as Asbestos Fines (Friable)*	Measurement on analytical balance, from the <10mm Fractions. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1-2
Asbestos as Asbestos Fines as % of Total Sample*	Calculated from weight of asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-2
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	Calculated from weight of fibrous asbestos plus asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-2

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Dates of testing are available on request. Please contact the laboratory for more information.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

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Certificate of Analysis

Page 1 of 4

Client:	Jacobs New Zealand Limited	Lab No:	2377637	SPv1
Contact:	George Hampton C/- Jacobs New Zealand Limited PO Box 10283 The Terrace Wellington 6143	Date Received:	03-Jun-2020	
		Date Reported:	09-Jun-2020	
		Quote No:	104761	
		Order No:	IZ105201	
		Client Reference:	IZ105201	
		Submitted By:	Max Blakemore	

Sample Type: Soil						
Sample Name:		TP01 - 0.1m 02-Jun-2020 9:10 am	TP01 - 0.5m 02-Jun-2020 9:15 am	TP02 - 0.1m 02-Jun-2020 10:00 am	TP02 - 0.5m 02-Jun-2020 10:15 am	
Lab Number:		2377637.1	2377637.2	2377637.4	2377637.5	
Individual Tests						
Dry Matter	g/100g as rcvd	70	64	69	71	-
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	10	9	8	9	-
Total Recoverable Cadmium	mg/kg dry wt	0.22	< 0.10	0.26	0.45	-
Total Recoverable Chromium	mg/kg dry wt	24	23	67	23	-
Total Recoverable Copper	mg/kg dry wt	51	51	42	57	-
Total Recoverable Lead	mg/kg dry wt	39	39	39	49	-
Total Recoverable Nickel	mg/kg dry wt	11	14	33	9	-
Total Recoverable Zinc	mg/kg dry wt	82	37	144	102	-
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.014	< 0.016	< 0.014	< 0.014	-
alpha-BHC	mg/kg dry wt	< 0.014	< 0.016	< 0.014	< 0.014	-
beta-BHC	mg/kg dry wt	< 0.014	< 0.016	< 0.014	< 0.014	-
delta-BHC	mg/kg dry wt	< 0.014	< 0.016	< 0.014	< 0.014	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.014	< 0.016	< 0.014	< 0.014	-
cis-Chlordane	mg/kg dry wt	< 0.014	< 0.016	< 0.014	< 0.014	-
trans-Chlordane	mg/kg dry wt	< 0.014	< 0.016	< 0.014	< 0.014	-
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	< 0.04	< 0.04	< 0.04	-
2,4'-DDD	mg/kg dry wt	< 0.014	< 0.016	< 0.014	< 0.014	-
4,4'-DDD	mg/kg dry wt	< 0.014	< 0.016	< 0.014	< 0.014	-
2,4'-DDE	mg/kg dry wt	< 0.014	< 0.016	< 0.014	< 0.014	-
4,4'-DDE	mg/kg dry wt	< 0.014	< 0.016	< 0.014	0.024	-
2,4'-DDT	mg/kg dry wt	< 0.014	< 0.016	< 0.014	< 0.014	-
4,4'-DDT	mg/kg dry wt	< 0.014	< 0.016	< 0.014	0.116	-
Total DDT Isomers	mg/kg dry wt	< 0.09	< 0.10	< 0.09	0.14	-
Dieldrin	mg/kg dry wt	< 0.014	< 0.016	< 0.014	< 0.014	-
Endosulfan I	mg/kg dry wt	< 0.014	< 0.016	< 0.014	< 0.014	-
Endosulfan II	mg/kg dry wt	< 0.014	< 0.016	< 0.014	< 0.014	-
Endosulfan sulphate	mg/kg dry wt	< 0.014	< 0.016	< 0.014	< 0.014	-
Endrin	mg/kg dry wt	< 0.014	< 0.016	< 0.014	< 0.014	-
Endrin aldehyde	mg/kg dry wt	< 0.014	< 0.016	< 0.014	< 0.014	-
Endrin ketone	mg/kg dry wt	< 0.014	< 0.016	< 0.014	< 0.014	-
Heptachlor	mg/kg dry wt	< 0.014	< 0.016	< 0.014	< 0.014	-
Heptachlor epoxide	mg/kg dry wt	< 0.014	< 0.016	< 0.014	< 0.014	-
Hexachlorobenzene	mg/kg dry wt	< 0.014	< 0.016	< 0.014	< 0.014	-
Methoxychlor	mg/kg dry wt	< 0.014	< 0.016	< 0.014	< 0.014	-



Sample Type: Soil

Sample Name:		TP01 - 0.1m 02-Jun-2020 9:10 am	TP01 - 0.5m 02-Jun-2020 9:15 am	TP02 - 0.1m 02-Jun-2020 10:00 am	TP02 - 0.5m 02-Jun-2020 10:15 am	
Lab Number:		2377637.1	2377637.2	2377637.4	2377637.5	
Organonitro&phosphorus Pesticides Screen in Soil by GCMS						
Acetochlor	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Alachlor	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	-
Atrazine	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Atrazine-desethyl	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Atrazine-desisopropyl	mg/kg	< 0.14	< 0.15	< 0.14	< 0.14	-
Azaconazole	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	-
Azinphos-methyl	mg/kg	< 0.14	< 0.15	< 0.14	< 0.14	-
Benalaxyl	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	-
Bitertanol	mg/kg	< 0.14	< 0.15	< 0.14	< 0.14	-
Bromacil	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Bromopropylate	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Butachlor	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Captan	mg/kg	< 0.14	< 0.15	< 0.14	< 0.14	-
Carbaryl	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Carbofuran	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Chlorfluazuron	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Chlorothalonil	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Chlorpyrifos	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Chlorpyrifos-methyl	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Chlortoluron	mg/kg	< 0.14	< 0.15	< 0.14	< 0.14	-
Cyanazine	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Cyfluthrin	mg/kg	< 0.09	< 0.10	< 0.09	< 0.09	-
Cyhalothrin	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Cypermethrin	mg/kg	< 0.17	< 0.19	< 0.17	< 0.17	-
Deltamethrin (including Tralomethrin)	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Diazinon	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	-
Dichlofluanid	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Dichloran	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2	-
Dichlorvos	mg/kg	< 0.09	< 0.09	< 0.09	< 0.09	-
Difenoconazole	mg/kg	< 0.10	< 0.11	< 0.10	< 0.10	-
Dimethoate	mg/kg	< 0.14	< 0.15	< 0.14	< 0.14	-
Diphenylamine	mg/kg	< 0.14	< 0.15	< 0.14	< 0.14	-
Diuron	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Fenpropimorph	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Fluazifop-butyl	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Fluometuron	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Flusilazole	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Fluvalinate	mg/kg	< 0.05	< 0.06	< 0.05	< 0.05	-
Furalaxyl	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	-
Haloxfop-methyl	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Hexaconazole	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Hexazinone	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	-
IPBC (3-Iodo-2-propynyl-n-butylcarbamate)	mg/kg dry wt	< 0.4	< 0.4	< 0.4	< 0.4	-
Kresoxim-methyl	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	-
Linuron	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Malathion	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Metalaxyl (Mefenoxam)	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Methamidophos	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4	-
Metolachlor	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	-
Metribuzin	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Molinate	mg/kg	< 0.14	< 0.15	< 0.14	< 0.14	-
Myclobutanil	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Naled	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4	-
Norflurazon	mg/kg	< 0.14	< 0.15	< 0.14	< 0.14	-

Sample Type: Soil						
Sample Name:	TP01 - 0.1m 02-Jun-2020 9:10 am	TP01 - 0.5m 02-Jun-2020 9:15 am	TP02 - 0.1m 02-Jun-2020 10:00 am	TP02 - 0.5m 02-Jun-2020 10:15 am		
Lab Number:	2377637.1	2377637.2	2377637.4	2377637.5		
Organonitro&phosphorus Pesticides Screen in Soil by GCMS						
Oxadiazon	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Oxyfluorfen	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	-
Paclobutrazol	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Parathion-ethyl	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Parathion-methyl	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Pendimethalin	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Permethrin	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	-
Pirimicarb	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Pirimiphos-methyl	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Prochloraz	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4	-
Procymidone	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Prometryn	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	-
Propachlor	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Propanil	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2	-
Propazine	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	-
Propiconazole	mg/kg	< 0.05	< 0.06	< 0.05	< 0.05	-
Pyriproxyfen	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Quizalofop-ethyl	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Simazine	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Simetryn	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Sulfentrazone	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4	-
TCMTB [2-(thiocyanomethylthio) benzothiazole, Busan]	mg/kg dry wt	< 0.14	< 0.15	< 0.14	< 0.14	-
Tebuconazole	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Terbacil	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Terbufos	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Terbumeton	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Terbuthylazine	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	-
Terbuthylazine-desethyl	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Terbutryn	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Thiabendazole	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4	-
Thiobencarb	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Tolyfluanid	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	-
Triazophos	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Trifluralin	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-
Vinclozolin	mg/kg	< 0.07	< 0.08	< 0.07	< 0.07	-

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

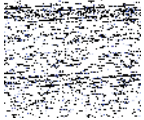
Sample Type: Soil			
Test	Method Description	Default Detection Limit	Sample No
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1-2, 4-5
Heavy Metals, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.10 - 4 mg/kg dry wt	1-2, 4-5
Organochlorine/nitro&phosphorus Pests Screen in Soils, GCMS	Sonication extraction, Dilution cleanup, GC-MS analysis. Tested on as received sample.	-	1-2, 4-5
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	1-2, 4-5

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Dates of testing are available on request. Please contact the laboratory for more information.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.



Ara Heron BSc (Tech)
Client Services Manager - Environmental

Appendix F. Table of Analytical Results

Attachment C

AC Contaminated Land Enquiry

21 January 2022

WSP
100 Beaumont Street
AUCKLAND 1010

Attention: Ben Gentile

Dear Ben

Site Contamination Enquiry – 253 Mill Road, Bombay

This letter is in response to your enquiry requesting available site contamination information within Auckland Council records for the above site. Please note this report does not constitute a site investigation report; such reports are required to be prepared by a (third-party) Suitably Qualified and Experienced Practitioner.

The following details are based on information available to the Contamination, Air & Noise Team in the Resource Consent Department. The details provided may be from former regional council information, as well as property information held by the former district/city councils. For completeness the relevant property file should also be requested to obtain all historical records and reports via 09 3010101 or online at:

<https://www.aucklandcouncil.govt.nz/buying-property/order-property-report/Pages/order-property-file.aspx>.

1. Hazardous Activities and Industries List (HAIL) Information

This list published by the Ministry for the Environment (MfE) comprises activities and industries that are considered likely to cause land contamination as a result of hazardous substance use, storage, and/or disposal.

Council's records indicate this site has possibly been subject to the following activity that falls within the HAIL:

- HAIL Item (A.10) – Persistent pesticide bulk storage or use including sport turfs, market gardens, orchards, glass houses or spray sheds.

Council records indicate the site has been utilised for horticulture and poultry activities since at least 1960.

Additionally, to the age of the buildings on site the potential for asbestos and/or lead paint may need to be considered.

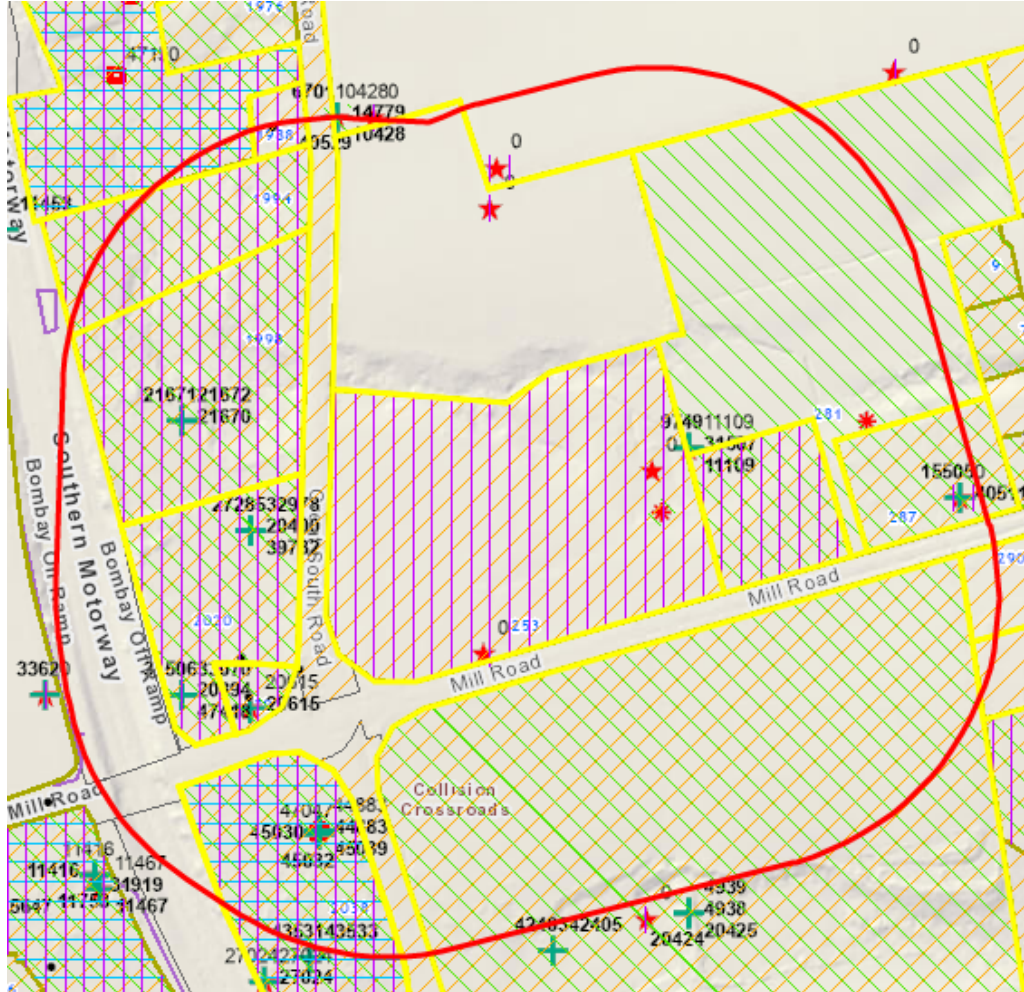
Please note:

- *If you are demolishing any building that may have asbestos containing materials (ACM) in it, you have obligations under the Health and Safety at Work (Asbestos) Regulations 2016 for the management and removal of asbestos, including the need to engage a Competent Asbestos Surveyor to confirm the presence or absence of any ACM.*
- *Paints used on external parts of properties up until the mid-1970's routinely contained lead, a poison and a persistent environmental pollutant. You are advised to ensure that soils affected by old, peeling or flaking paint are assessed in relation to the proposed use of the property, including high risk use by young children.*

2. Consents and Incidents Information (200m radius of the selected site)

The Council database was searched for records of the following activities within approximately 200 metres of the site:

- Pollution Incidents (including air discharges, oil or diesel spills)
- Bores
- Contaminated site and air discharges, and industrial trade process consents
- Closed Landfills
- Air quality permitted activities



Legend:

All Consents +	Closed Landfill (Auckland Council owned) □
All Applications ■	Closed Landfill (Privately owned) ■
All Permitted Activities *	
All Bores ★	

Relevant details of any pollution incidents and consents are appended to this letter (Attachment A). Please refer to the column titled 'Property Address' on the spreadsheet to aid in identifying corresponding data on the map.

While the Auckland Council has carried out the above search using its best practical endeavours, it does not warrant its completeness or accuracy and disclaims any responsibility or liability in respect of the information. If you or any other person wishes to act or to rely on this information, or make any financial commitment based upon it, it is recommended that you seek appropriate technical and/or professional advice.

If you wish to clarify anything in this letter that relates to this site, please contact contaminatedsites@aucklandcouncil.govt.nz. Any follow up requests for information on other sites must go through the online order process.

Should you wish to request any of the files referenced above and/or listed in the attached spreadsheet for viewing, please contact the Auckland Council Call Centre on 301 0101 and note you are requesting former Auckland Regional Council records (the records department requires three working days' notice to ensure the files will be available).

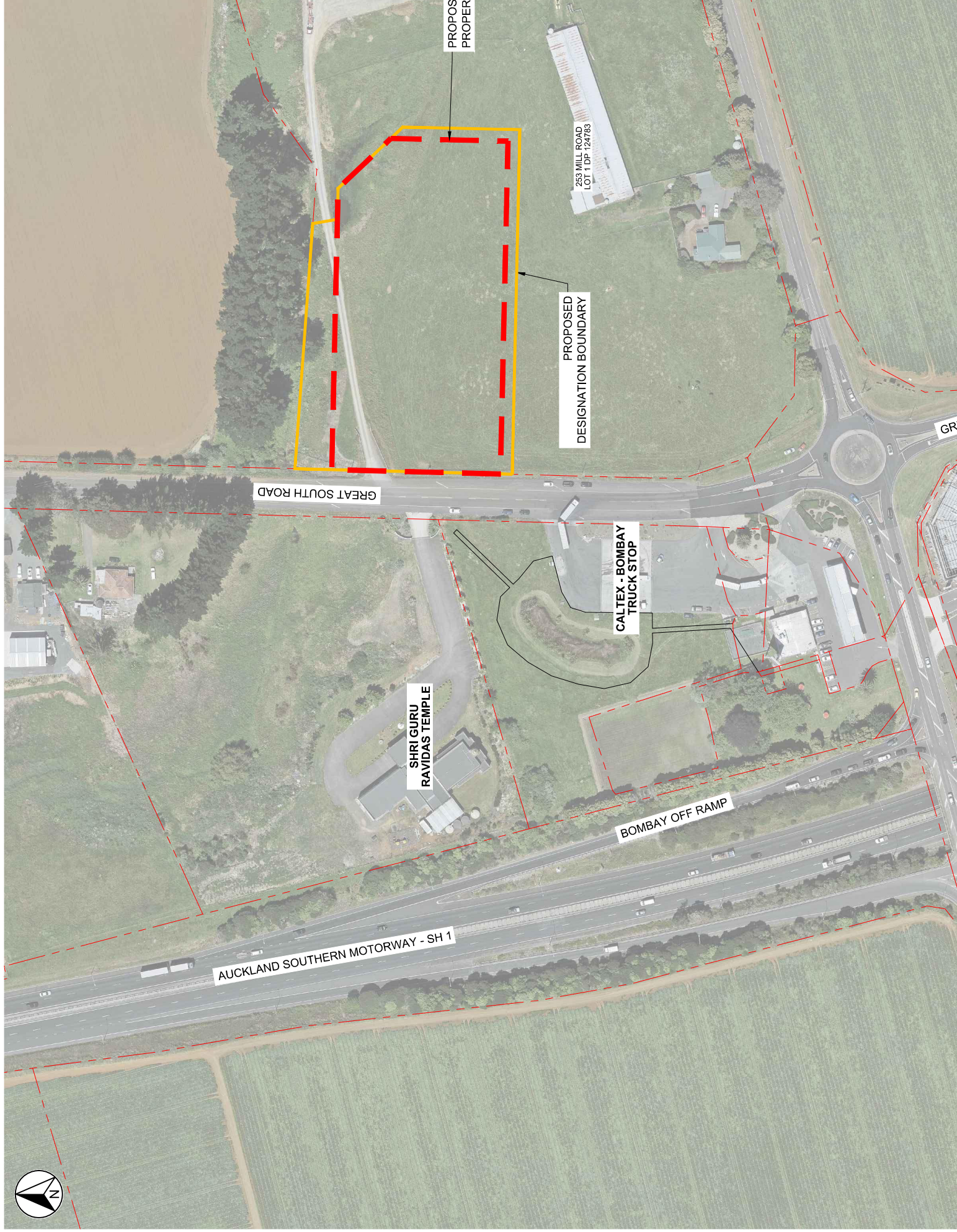
Please note Auckland Council cost recovers officer's time for all site enquiries. As such an invoice for \$128 for the time involved in this enquiry will follow shortly.

Yours Sincerely,

**Contamination, Air and Noise Team
Specialist Unit | Resource Consents
Auckland Council**

Attachment D

Updated Design Plans



PROPOSED
PROPER

253 MILL ROAD
LOT 1 DP 124783

PROPOSED
DESIGNATION BOUNDARY

GREAT SOUTH ROAD

CALTEX - BOMBAY
TRUCK STOP

SHRI GURU
RAVIDAS TEMPLE

BOMBAY OFF RAMP

AUCKLAND SOUTHERN MOTORWAY - SH 1



300 mm 200 100 50



TO AUCKLAND

GREAT SOUTH ROAD

PAVEMENT SHOULDER WIDENING. REFER TO C-6100

HEAVY DUTY VEHICLE CROSSING. REFER TO C-5110

VEHICLE ENTRANCE

CONCRETE VEHICLE CROSSING INDUSTRIAL / COMMERCIAL AS PER AUCKLAND TRANSPORT ENGINEERING STANDARDS

OFF-LOAD AREA

STANDR KERB & CHANNEL REFER TO C-5110

4 STUFF PARKING

VEHICLE EXIT

HEAVY DUTY VEHICLE CROSSING. REFER TO C-5110

CONCRETE VEHICLE CROSSING INDUSTRIAL / COMMERCIAL AS PER AUCKLAND TRANSPORT ENGINEERING STANDARDS

GREEN TERRAMESH WALL

RURAL VEHICLE ACCESS PAVEMENT. SEE SPECIFICATIONS BY BARTLEY LTD.

TWO SLOWSTOP® BOLLARDS - 168mm DIA

STANDARD KERB & CHANNEL. REFER TO C-5110

ROAD SAFETY BARRIER

STANDARD KERB & CH

300 mm 200 100 50

