WILLIAMSON
WATER & LAND ADVISORY

1618 and 1646c Ararimu Road, Papakura

Preliminary Site Investigation (Ground Contamination)

SB CIVIL LTD

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3 August 2023

1618 and 1646c Ararimu Road, Papakura

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Document history and status

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1	3 August 2023	Preliminary Site Investigation	Lauren Windross	Shane Moore	Wendi Williamson

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1	3 August 2023	SB Civil, Auckland Council	For resource consent

Front cover image: SB Civil Ltd drone image (9 November 2022)

Investigation Summary

Williamson Water & Land Advisory (WWLA) has prepared this Preliminary Site Investigation (PSI) into ground contamination to support SB Civil Ltd with application to operate a managed (Class 3) fill facility at 1618 and 1646c Ararimu Road, Papakura, Auckland.

The objective of this investigation was to determine whether or not activities included on the Ministry for the Environment's Hazardous Activities and Industries List (HAIL) are or have occurred and if so, what the implications are (if any) for development of a managed fill facility at the site.

The key findings of this report are:

History and potential for contamination [Section 3]	**No HAIL activities were identified within the area of the proposed managed fill.** The site inspection and review of past land use indicates the site has predominantly been used for stock grazing land since at least 1944. A small "rotten rock" quarry also operated on the site.
Conceptual Site Model (CSM) [Section 4]	**This assessment has not identified any potentially contaminating activities on the site that may present an unacceptable risk to human health or the environment.** • The CSM, developed to show where potential risks for future redevelopment of the land may lie, indicates no contamination-related risks for the development process, as there are no contaminant sources. • There is therefore no risk to people or ecological receptors during disturbance of soil as part of the preparation works for receiving imported fill. • Standard earthworks controls are appropriate for any clearance and preparation works in existing ground. Site specific management plans are expected to be implemented during subsequent placement of managed fill at the site.
Consenting implications [Section 5.1]	**Resource consent is not required under contaminated land related rules in the NESCS or AUP.** • The NESCS does not apply because no HAIL activities have occurred on site. • Rules in the AUP do not apply as no HAIL activities have occurred and thus soils that contain 'elevated levels of contaminants' are not expected to be present at the site.
Construction implications [Section 5.2]	**There are no ground contamination-related implications for the fill site's development.** • Site specific management plans are expected to be implemented during subsequent placement of managed fill at the site.

Contents

1. Introduction

Williamson Water & Land Advisory (WWLA) has prepared this Preliminary Site Investigation (PSI) to support pre-works planning associated with SB Civil Ltd's proposal to develop a managed fill facility on 1618 and 1646c Ararimu Road[1] (herein referred to as 'the site'). The location of the site is shown in **Figure 1.**

Figure 1. Site Location (outlined red) (Image source: LINZ). Dashed line shows property boundary between 1618 Ararimu Road (left) and 1646c Ararimu Road (right).

1.1 Background

SB Civil Ltd is proposing to develop a managed fill facility at the site. Initial activities at the site will focus on site preparation, including removal of pine trees in the centre of the site and construction of access roads. Quarrying is then proposed to take place, expanding on the existing quarry located in the eastern portion of the site. As quarrying progresses, filling would then be able to occur in a staged manner, infilling the portions of the site that had been previously quarried. There is also potential to create bunds on lower slopes to artificially create areas where fill can be placed. Fill is intended to be sourced from SB Civil's earthworks clients.

A preliminary fill plan is provided in **Appendix A**.

[1] Neither property has a street address on Auckland Council's GIS Viewer. We have allocated street numbers for simplicity for the purposes of this report. The legal descriptions and addresses are set out in **Section 2.1**.

1.2 Objective and scope of work

The purpose of a PSI is to determine whether HAIL activities[2] may have occurred on the site. Land where HAIL activities have occurred may contain contaminants and be subject to the requirements of the National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS) Regulations (2011). While the fill will only occupy a portion of the site, this PSI has addressed the entire site for completion and so that it can be used in the event of any future variations.

The scope of this investigation comprised:

1. Review of the site's history including:
   - Historical aerial photographs sourced from Retrolens, Auckland Council (AC) GIS viewer, and Google Earth Pro; and
   - Auckland Council property file.
2. Site walkover inspection by a Suitably Qualified and Experienced Practitioner (SQEP) from WWLA.
3. Assessment of the potential for contamination, based on historical land use and evaluation of that against the HAIL.
4. Development of a conceptual site model (CSM) to assess contaminant risks and mitigation requirements during development and operation of the managed fill.
5. Evaluation of consenting requirements and earthworks/construction implications for the proposed filling operation.

1.3 Legislative requirements

WWLA has undertaken the investigations and prepared this report in general accordance with requirements of published industry best practice guidance, including the Ministry for the Environment (MfE) Contaminated Land Management Guideline No. 1: Reporting on Contaminated Sites in New Zealand (CLMG 1; revised 2021).

This report has been prepared, reviewed, and certified by Suitably Qualified Environmental Practitioners (SQEP) as described in the NESCS Users Guide[3]. CVs confirming the SQEP status of our contaminated land specialists is available on request.

[2] As described by the Ministry for the Environment's Hazardous Activities and Industries List (HAIL)
[3] NESCS Users Guide (April 2012).

2. Site Description

2.1 Site identification

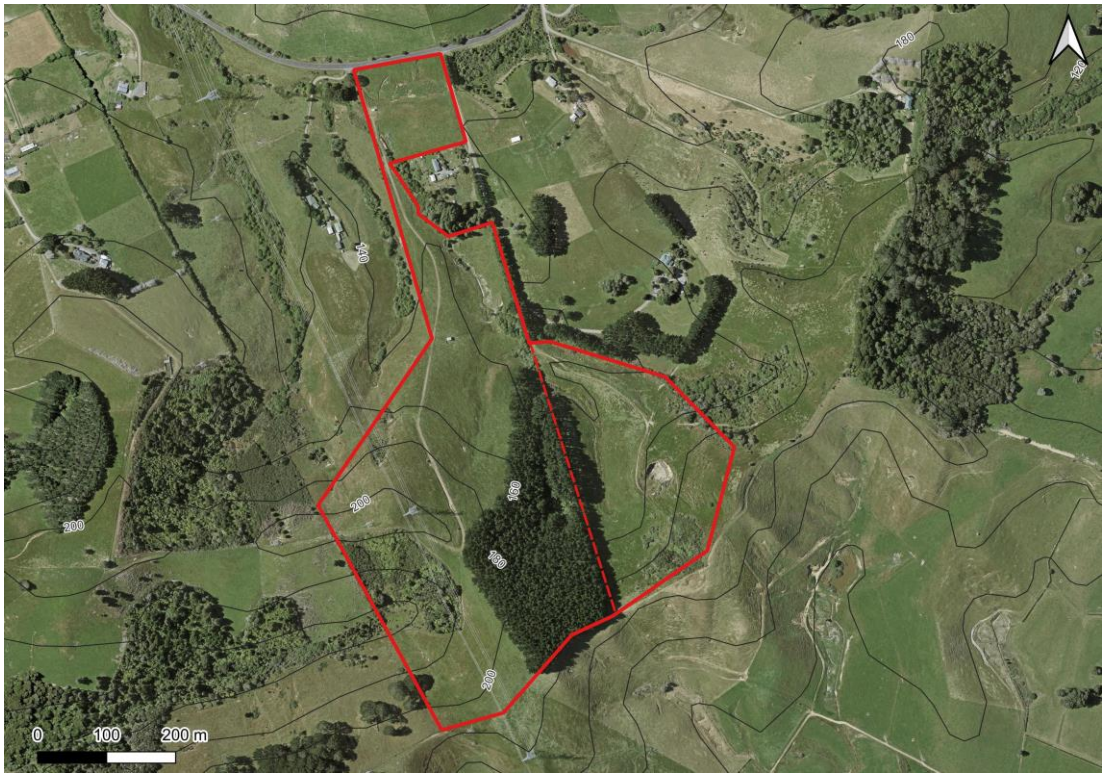
The site comprises two land parcels located at 1618 and a portion of 1646c Ararimu Road, Papakura. The legal descriptions and sizes of the two parcels are set out below:

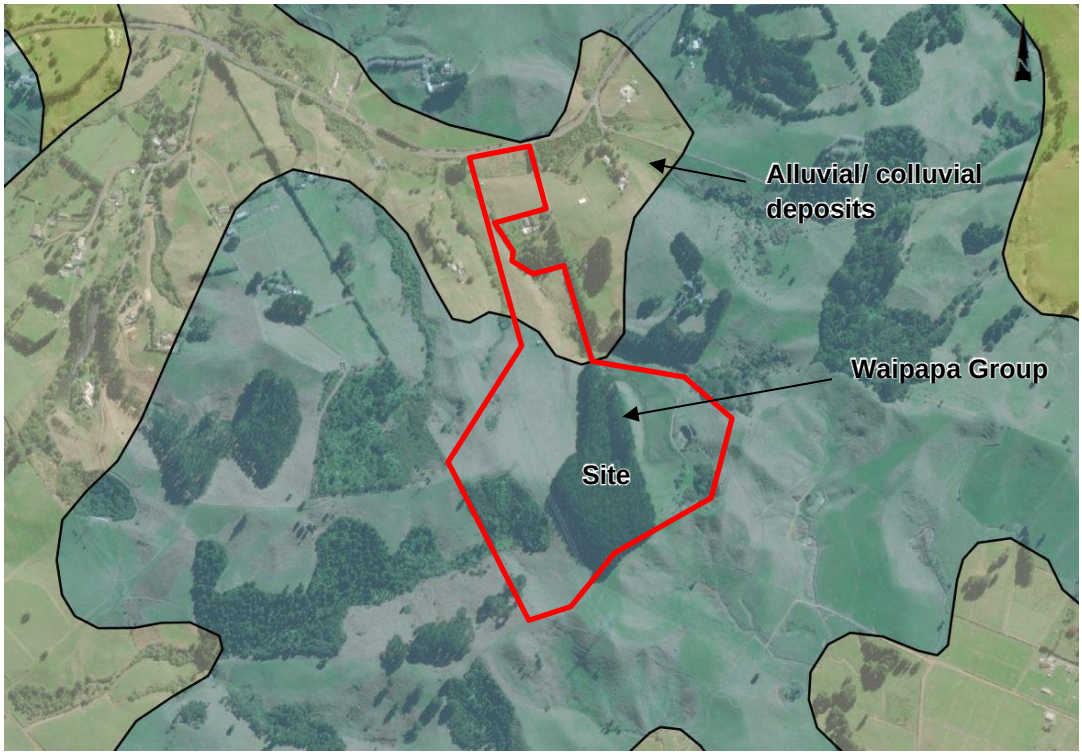
Address	Legal description	Certificate of title	Area
1618 Ararimu Road	Lot 2 DP 77813	NA89C/580	19.22 ha
1646c Ararimu Road	Lot 1 DP 166299, Lot 8 DP 369781	369962, 283215	5.62 ha (of larger 21.28 ha parcel)

2.2 Environmental setting

The environmental setting is described in **Table 1.** The features of the environmental setting are considered in the context of their potential to affect the distribution, mobility and form of contaminants (if present).

Table 1: Environmental setting

Site surrounds	The site is bordered by open Rural – Rural Production Zone land, primarily used for pasture with isolated dwellings and bush.
Topography	*The topography of the site impacts where contaminants might migrate to if present.* The site topography slopes up from north to south from approximately 125m RL to 185m RL. The entrance to the property is relatively flat but it becomes progressively steeper towards the southern boundary. A shallow valley separates the eastern and western sides of the property (**Figure 2**).  **Figure 2. Topography of the site (source: LINZ).**

Geology	*Geological conditions are considered in the context of describing the conceptual site model (CSM, **Section 4**) should a potential for contamination be identified by this desk study. For example, more porous soils can enable contaminants (if present) to move more quickly and potentially further than clay-rich soils that retain/ bind or prevent penetration of contaminants.* The published geology (Error! Reference source not found.**)** describes the site being underlain by Waipapa Group composite terrane, composed of massive to thin-bedded, lithic volcaniclastics sandstone, with tectonically enclosed spilite, chert, and red and green argillite. Alluvial deposits are mapped as being present across the lower (northern) portion of the site.  **Figure 3. Published geology of the Ararimu area with the site marked red. (Source GNS Webmaps[4]).**
Hydrogeology	*Hydrogeological conditions affect potential risk of contaminants (if present) entering and being transported in groundwater*. Based on nearby borehole log data available on the NZGD[5], regional groundwater is expected to occur at approximately 6 m below ground level (BGL) beneath the lower (northern) portion of the site. Regional groundwater is expected to flow to the north into the Hunua River catchment. Perched groundwater is expected to encountered at shallow depth in the lower reaches of the central valley.
Surface water bodies	*Surface water features are potential receiving environments should contaminants be present on a site.* A permanent stream is indicated on Auckland Council GeoMaps to be present in the valley on the lower (northern) portion of the site. Based on our site walkover inspection observations, this has been modified to some extent including vehicle crossings and realignment in some sections. The surrounding area, beyond the site, is drained by similar gully streams.
Sensitive receptors	*Sensitive environmental receptors could include aquatic or terrestrial ecosystems. This is not an ecological assessment but is instead an initial review of the surrounding environment to assess where contaminants (if present) on the site could migrate to and affect.* The aquatic and terrestrial ecosystems of the stream, particularly at the northern end of the site, represent the nearest sensitive environmental receptors. An area of native bush on the southwest side of the site may also be considered a sensitive receptor.

[4] GNS Science Webmaps. Reviewed 20 February 2023. (https://data.gns.cri.nz/geology)
[5] New Zealand Geotechnical Database: https://www.nzgd.org.nz/ARCGISMapViewer/mapviewer.aspx

	Sensitive human receptors could, for example, be homeowners in close proximity or adjacent to a site. Workers on industrial land (on or adjacent to a site) would be considered less sensitive. This receptor interpretation informs the CSM and the guideline criteria selection for evaluation of soil testing data. The site is bounded by a mixture of rural residential and rural properties. Residents may be considered sensitive receptors as they may include vulnerable populations such as children. However, as the nearest dwellings are some 200 m away from the proposed fill areas the occupants are highly unlikely to be impacted by contaminants derived from the site.

3. HAIL Assessment

This HAIL assessment involves a site walkover inspection and a review of historical activities to determine whether activities on the MfE's HAIL have occurred on the site. The HAIL assessment also informs, at least initially, the consenting status under the NESCS, and if any sampling is required.

3.1 Property Features

The site was visited by Contaminated Land Specialists from WWLA on 9 November 2022 and 22 February 2023. The following observations were made (refer to **Photographs 1** to **4** below).

- The site has an undulating topography (sloping down from south to north) and is surfaced mostly in pasture with areas of native bush and a central pine plantation (**Photograph 1**). All vegetation appeared healthy and unstressed.
- Three small stream gullies are present, two running north-south (one east and one west of the pine plantation) and the other east-west in the northern portion of the site. The eastern-most gully has a small landslide at its head, presumably resulting from recent rainfall events.
- The western portion of the site is accessed directly from Ararimu Road, with the eastern portion of the site accessed via a track from 1628b Ararimu Road.
- Steel power pylons/transmission towers are present on the south-western portion of the site but filling is expected to remain at distance from these (**Photograph 2**).
- Two small sheds associated with agricultural activities are located on western portion of the site. These are constructed of painted corrugated steel. A red coloured shed located centrally on the site (**Photograph 1**) is used as a poultry shelter. A white coloured shed located in the northern portion of the site (**Photograph 3**) was not able to be accessed during our site visit.
- A former quarry is located on the eastern side of the site. It is currently not used but still has an access track leading to it (**Photograph 4**).
- Rural residential properties are located near the western and eastern boundaries (**Photograph 3**).

Photograph 1. Western site view looking north towards Ararimu Road.

Photograph 2. Looking south across the site at proposed fill site. Telecommunication pylons shown in the background. Unnamed access road to shown on the right.

Photograph 3. Looking south across the site. Healthy vegetation and wetland extent shown. Two minor buildings used for agricultural purposes located along the access road.

Photograph 4: Former quarry (circled) on eastern portion of site. Small landslide visible to the right of the quarry (image looking south).

3.2 Site history

In summary, the historical review (detailed in the following subsections) shows the site and wider property to have primarily been used as grazing/ pastoral land from at least the 1940's until present. The only other features identified were:

- The only structures on site are those associated with pastoral activities (fences, troughs and small animal shelters) and transmission towers (outside of the fill footprint).
- A small "rotten rock" quarry that has been operational since 1968 but has not included any permanent infrastructure other than an unpaved access road.

3.2.1 Aerial photograph review

Historical aerial imagery available from Auckland Council GIS, Retrolens and Google Earth Pro were reviewed and are summarised in **Table 2** below.

Table 2. Historical aerial photograph review

Photograph date (source)	Activities	Aerial image (site in red outline)
1944 Retrolens (SN348 G/9)	Property is predominantly undeveloped pasture, bound by Ararimu Road on the northern side and pastoral land on all other sides. There are no visible structures present on the site. An area of quarrying or earthworks, with associated access track, is evident in the east of the site.	
1961-1969 Retrolens (SN1397 3244/46)	Earthworks appear to have been undertaken recently in both the area of quarrying and access track. Otherwise, no material changes evident, relative to previous imagery, on the site or on surrounding properties. A transmission pylon can be seen near the western boundary of the site. (1969 image shown)	

Photograph date (source)	Activities	Aerial image (site in red outline)
1977 Retrolens (SN5164 C4)	There are no significant changes relative to previous imagery. A track (either for horses or vehicle racing) has been developed on the property to east.	
1988 Retrolens (SN8772 W/25)	A stock shed (later confirmed for poultry) is now visible in middle of the site. Quarrying appears to have ceased.	
2010-present Google Earth Pro	By 2010 a central access road was established through the property. This appears to have been to support the construction of a second transmission pylon in the west of the site (visible in subsequent images). The central-southern portion of the site is now largely covered in what appears to be plantation forestry, correlating with the remnant pine planation which remains on the site today. An additional small building has been built near the property entrance on Ararimu Road. This correlates with the location of the current white shed. Quarrying appears to have recommenced in the east of the site. No significant changes are evident in images available through to the present day. (2010 image shown)	

3.2.2 Auckland Council information

During January 2023 WWLA requested the property files for the site from the Auckland Council. Our review of the documents is summarised below in **Table 3**.

Table 3. Relevant property file record summary

Date	Summary of relevant document(s)
1618 Ararimu Road	
Undated	A general property document lists three buildings as being present: a farm shed (constructed 1958), an implement shed (1982) and a haybarn (1981). The document also notes that a quarry was opened in 1968. It appears that the two properties may have been a single title at the time. A related document is dated 1989 and sets out a proposed subdivision.
1980s	Several documents for extensions to buildings, etc. None are within the site.
1646c Ararimu Road	
1968	Franklin County Council documents detailing the opening of a quarry for metal extraction. Conditions state that is must be backfilled following completion. Overburden is to be stripped, stockpiled and compacted to prevent the silting or pollution of any watercourse. A 1998 inspection note describes the quarry as a small operation for "rotten rock".
-	Several documents of varying ages relating to buildings etc that are outside of the site.

3.3 Potential for Contamination

Potentially contaminating activities identified for the site are described in **Table 4** along with an assessment of the likelihood and magnitude of any contamination resulting from the activity, and whether the activity constitutes a HAIL in the context of the proposed filling activity.

In summary, no HAIL activities have occurred in the past nor are any occurring currently in the proposed fill area.

Table 4: Evaluation of potentially contaminating activities from previous and current land use.

Land use and associated HAIL activity	Potential contaminants	Possible extent of contamination	HAIL Assessment
Transmission pylons *HAIL Activity I: Intentional or accidental release of a contaminant in sufficient quantity that it presents a risk to human health or the environment.*	Metals, particularly lead and zinc	Elevated concentrations of metals can occur in the vicinity (generally < 10 m from) of transmission pylons as a result of the use of galvanised metals and corrosion maintenance activities[6]. The pylons will not be disturbed or removed as part of these works. Setbacks or buffers (typically 12 m) are also required to be maintained around these structures. It is therefore highly unlikely that contamination, if present, will extend into the expected footprint of the future fill area. Therefore, HAIL Activity I is highly unlikely to apply to the proposed fill area.	Not a HAIL Activity.
Quarry *Not a HAIL activity*	-	Quarrying has only been on a small scale and without permanent infrastructure having been installed, as such is highly unlikely to have included HAIL activities (i.e. is highly unlikely to have used explosives such that Activity C1 applies, nor storage of fuels etc.). Potential for contamination from this source is expected to be negligible.	Not a HAIL Activity

[6] Herms, U. and F. Peterson, 1990. Heavy metal contamination of soils under power pylons. Zeitschrift für Kulturtechnik und Landentwicklung, 1990 Vol. 31 No. 2 pp. 101-105

4. Conceptual Site Model

A conceptual site model (CSM) indicates known and potential sources of contamination, routes of exposure (pathways), and the receptors that are affected by contaminants moving along those pathways. Receptors may be people or environmental.

A CSM is the key evaluation process in determining whether or not potential or actual contamination poses a risk to people or the environment should the proposed activity occur. In this case the proposed activity is earthworks associated with the creation of a managed fill site and with the ongoing deposition of material into the site over its lifespan.

The site history assessment shows there are no identified potential sources of contamination associated with current and prior land uses in the site within the area of the proposed managed fill. As there is no source of contamination thus no pathways or receptors are relevant.

5. Development Implications

5.1 Consenting

The summary of contaminated-land related consenting requirements is provided in **Table 5** and discussed in detail in the following sections (**5.1.1** and **5.1.2**). This assessment has been based on construction and operation of a managed fill requiring earthworks and a change in the use of land.

Table 5. Consenting requirements

Regulatory Framework	Rule	Consent required (Y/N and type)
NESCS	NESCS does not apply as HAIL activities have not taken place in the proposed filling area.	No – not applicable
Auckland Unitary Plan	No evidence has been identified to suggest that soils containing 'elevated levels of contaminants' are present in the proposed filling area. Therefore, Section E30 of the AUP does not apply.	No – not applicable

5.1.1 NESCS

The NESCS sets out nationally consistent planning controls appropriate to district and city councils for assessing potential human health effects related to contaminants in soil. 1418 Ararimu Road is administered via Auckland Council. The regulations apply to specific development activities (namely soil disturbance, soil sampling, subdivision, land use change, and fuel system removal) carried out on land where an activity included on the HAIL has occurred.

The NESCS only applies to a *piece of land* where a HAIL has occurred. No HAIL activities have occurred in the proposed filling area, thus as shown in **Table 6**, the NESCS does not apply.

Table 6. PSI checklist

NESCS Requirement	Applicable to this site?
Is an activity described on the HAIL currently being undertaken on the piece of land to which this application applies?	No
Has an activity described on the HAIL ever been undertaken on the piece of land to which this application applies?	No
Is it more likely than not that an activity described on the HAIL is being or has been undertaken on the piece of land to which this application applies?	No
If 'No' to all the above, then the NESCS <u>does not</u> apply.	

5.1.2 Auckland Unitary Plan

The Auckland Unitary Plan (AUP), Section E30 contains rules that address discharges to the environment, both during works and in the long term. The contaminated land rules of the AUP apply to soils that contain 'elevated levels of contaminants' which is defined as contaminants exceeding the permitted activity discharge criteria in Table E30.6.1.4.1. Consent is required when contamination levels exceed the permitted activity criteria and earthworks exceed 200m^3.

Our site history review does not indicate any potential for contamination on site. As such, we consider contaminated land rules of the AUP do not apply to this site.

5.2 Construction Implications

Standard earthworks and health and safety controls will be appropriate for the site preparation works:

Earthworks controls	Standard earthwork controls as set out in Auckland Council's GD05 – Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region are applicable for the work preparation works, with particular focus on ensuring that there are no discharges of sediment to surface water or surrounding sites. Placement of fill during operation of the site is expected to be subject to site specific management plans.
Health and safety	There are no specific contamination-related health and safety requirements for onsite workers during site preparation works. Health and safety during fill placement is expected to be subject to site specific management plans

6. Conclusions

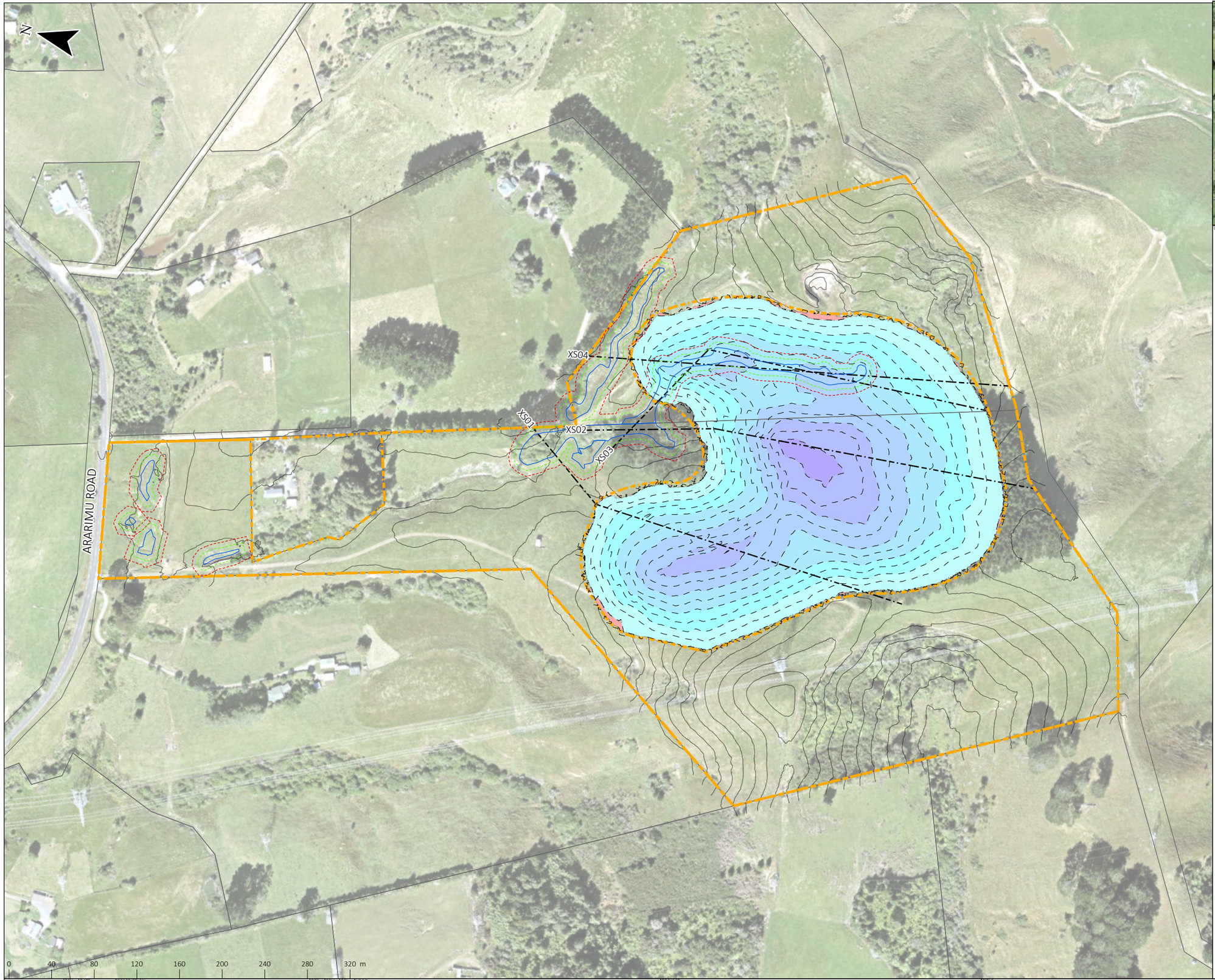
This PSI has been prepared for SB Civil Ltd to support the consent application for the construction and operation of a managed fill at 1618 and 1646c Ararimu Road, Papakura.

The site inspection and history review has not identified any HAIL activities as currently occurring or having occurred in the area of the proposed managed fill.

These findings mean:

- There are no potentially contaminating activities on the site that present an unacceptable risk to human health or the environment.
- The NESCS regulations do not apply to the proposed managed fill construction.
- No consent is required under the AUP contamination rules as no potential for contamination has been identified, so contaminant concentrations are highly unlikely to exceed permitted activity standards.
- Standard earthworks and health and safety controls and procedures are applicable for preparation of the managed fill site. Site specific management plans are expected to be implemented during subsequent placement of managed fill at the site.

Appendix A. Preliminary Fill Plan



LEGEND:

RETAINING WALLS W DRAINAGE (H=HEIGHT, C=CHAINAGE, ARROWS SHOW FALL DIRECTION)

- EARTHWORKS EXTENT
- EARTHWORKS SECTIONS
- PAVEMENT
- BUILDINGS
- EXISTING PARCELS
- EXISTING KERBLINES
- EXISTING IMPERVIOUS
- EXISTING BUILDINGS
- PROPOSED CONTOURS

CUTFILL

- -60.00--50.00m
- -50.00--40.00m
- -40.00--30.00m
- -30.00--20.00m
- -20.00--10.00m
- -0.05--10.00m
- -0.05-0.05m
- 0.05-10.00m
- 10.00-20.00m
- 20.00-30.00m
- 30.00-40.00m
- 40.00-50.00m
- 50.00-60.00m
- Wetland
- Wetland 5m offset
- Wetland 10m offset

EW ID	UNITS	EW001	EW002	TOTAL
AREA	**m²**	**93,611**	**272,753**	**366,364**
CUT	m³	421.3	0.3	421.5
BULK TOT. CUT	**m³**	**421.3**	**0.3**	**421.5**
MAX. CUT DEPTH	**m**	**3.6**	**0.2**	**3.6**
FILL	m³	1,953,838.5	1.5	1,953,840.0
FILL +15% BF.	m³	2,246,914.3	1.8	2,246,916.0
BULK TOT. FILL	**m³**	**2,246,914.3**	**1.8**	**2,246,916.0**
BULK CUT OFFSITE	m³	-	-	0.0
BULK CUT TO FILL	m³	-	-	421.5
BULK FILL IMPORT	m³	-	-	2,246,494.5
BULK TOT. VOL.	**m³**	**2,247,335.5**	**2.0**	**2,247,337.6**
MAX. FILL HEIGHT	**m**	**52.5**	**0.4**	**52.5**
BULK TRUCKS	Trucks	-	-	374,416
TOPSOIL TOT. VOL.	**m³**	**0.0**	**0.0**	**0.0**
TOPSOIL TRUCKS	Trucks	-	-	0
EW TOT. VOL.	**m³**	**2,247,335.5**	**2.0**	**2,247,337.6**
EW TOT. TRUCKS	Trucks	-	-	374,416

Existing Surf. is finished ground level

Proposed Surf. is Finished Surface

NOTES:
1. ALL WORKS TO COMPLY WITH COUNCIL AND PUBLIC NETWORK OPERATOR STANDARDS. ANY AMBIGUITY BETWEEN DRAWINGS AND STANDARDS TO BE REPORTED TO THE ENGINEER FOR CLARIFICATION.
2. THE CONTRACTOR IS TO PEG INFRASTUCTURE LOCATIONS AND EARTHWORKS LEVELS PRIOR TO ORDERING MATERIALS.
3. UNDERFILL DRAINAGE IS TO BE INSTALLED AT THE DIRECTION OF THE ENGINEER. IF THE CONTRACTOR ENCOUNTERS SPRINGS OR OTHER SOURCES OF WATER, THEY ARE TO NOTIFY THE ENGINEER.
4. EARTHWORKS ARE NOT TO BE EXTENDED INTO ADJOINING SITES UNLESS THE ENGINEER HAS ISSUED SPECIFIC INSTRUCTIONS.
5. THE CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING AND PROTECTING EXISTING SERVICES AND DRAINAGE ON SITE.
6. THE CONTRACTOR SHALL CLARIFY THE AREAS AND EXTENT OF CLEARING WITH THE ENGINEER BEFORE COMMENCEMENT AND CONFIRM THAT ALL NECESSARY CONSENTS ARE IN PLACE.
7. EARTHWORKS TOLERANCES ARE TO BE +-25mm.
8. ALL VOLUMES ARE SOLID MEASURE, NO BULKING FACTOR APPLIED UNLESS OTHERWISE NOTED.
9. RETAINING WALL SETOUT - EXACT SETTING OUT POSITION OF RETAINING WALLS IN RELATION TO LOT BOUNDARIES AND BUILDINGS TO BE OBTAINED FROM ARCHITECT OR STRUCTURAL ENGINEER PRIOR TO CONSTRUCTION COMMENCING.

IMAGERY CREDITS
Auckland Council, Maxar, LINZ, Stats NZ, Esri, HERE, Garmin, Foursquare, METI/NASA, USGS

SCAN FOR 3D:

allsite.ai

REV:	DATE:	DESCRIPTION:	DES:	REV:	REL:	LOGO:

CIVIX

PROJECT: 1618 ARARIMU ROAD, PAPAKURA

TITLE: CUT FILL PLAN

STATUS: FOR INFORMATION ONLY

DRAWING NO: 30000

SCALE:	SIZE:	REVISION:	DATE:
1:3,500	A3	17/07/23	17/07/23