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solutions for your environment

27 May 2026

Raj Patil
Project Manager
Hawke's Bay Regional Council
159 Dalton Street
NAPIER 4110

Dear Raj

PRELIMINARY SITE INVESTIGATION: PAKOWHAI PUMP STATION, FARNDON ROAD, HASTINGS DISTRICT

1.0 Introduction

Pattle Delamore Partners Limited (PDP) has been engaged by Hawke's Bay Regional Council (HBRC) to undertake a Preliminary Site Investigation (PSI; desktop site history review) for the Pakowhai Pump Station, located on the property legally described as PT PUNINGA 4A3 BLK XII HERETAUNGA SD INT IN & SUBJ TO R O W, at Farndon Road, Hastings District. The Pakowhai Pump Station is strategically positioned between two major rivers, the Tūtaekuri and Ngaruroro, and between smaller streams and man-made drainage channels. Local streams and drainage networks are designed to collect runoff from surrounding land. These streams feed into the major rivers and are an essential part of the local hydrological system. The pump station ensures that these channels do not overflow by pumping excess water away. The location of the Pakowhai pumpstation (the site) is highlighted in Figure 1 in Appendix B.

We understand that the pump station is to be upgraded as it was inundated during Cyclone Gabrielle. As part of the upgrade works, it is proposed to excavate approximately 400 m^3 of soil to build a secure foundation for the new pump station. We understand that as part of the redevelopment, earthworks will extend over areas of approx. 13 m by 4.5 m and 14 m by 7 m for each of the two pump station buildings and to a maximum depth of 4.5 m below ground level (bgl), subject to geotechnical requirements. Most of this excavated material maybe moved off site to an approved disposal facility.

The objective of the investigation was to identify any potential sources of contamination from past and/or present land use activities at the site, which could be listed on the HAIL[1] (Ministry for the Environment; MfE, 2023).

The scope of the investigation comprised a review of available site history information including historical aerial photographs and images, Hastings District Council (HDC) and HBRC property information, and a site visit.

[1] *The Hazardous Activities and Industries List guidance: Identifying HAIL land* (HAIL; MfE, 2023) is a compilation of activities and industries that are considered likely to cause land contamination resulting from hazardous substance use, storage or disposal. The HAIL is intended to identify most situations in New Zealand where hazardous substances could cause, and in many cases have caused, land contamination.

The PSI has been prepared in general accordance with the Ministry for the Environment (MfE) *Contaminated Land Management Guidelines No. 1: Reporting on Contaminated Sites in New Zealand (Revised 2021)* (MfE, 2021) and has been certified by a Suitably Qualified and Experienced Practitioner (SQEP) as outlined by the NESCS[2]. A certifying statement to this effect is attached in Appendix A.

2.0 Investigation Area Details

The site details are summarised below in Table 1.

Table 1: Investigation Area Identification

Address	Farndon Road, Clive
Legal Description	PT PUNINGA 4A3 BLK XII HERETAUNGA SD INT IN & SUBJ TO R O W
Property Owner	Hawke's Bay Regional Council
Grid Reference – Pakowhai Pumpstation	x=1934943 y=5612528 (NZGD2000)
Property Area	15,800 m^2
Site Area	~200 m^2 (approx.)
Zoning	Plains Production/River Conservation
Land Use	Rural Industry
Surrounding Land Use	Agricultural land, including horticulture and viticulture to the north, east and west; river conservation areas associated with the Tūtaekuri and Ngaruroro Rivers to the south and south-east.

A site visit was undertaken by a PDP professional on 28 August 2024. Photographs taken during the site visit are included in Appendix C.

The Pakowhai Pump Station comprises two pump houses, both facing south-west (see photographs 1, 2, and 3) and oriented towards a drainage channel that runs from south-west to north-east (see photographs 4, 5, and 6). Due to limited or insufficient natural gravity drainage, the pump station is essential for managing water flow from the surrounding area, directing it towards the Ngaruroro River. The eastern building is the taller of the two (see photograph 2) and is connected to the regional power grid via overhead cables linking it to the main power lines (see photographs 5 and 6). The ground is covered with compacted gravel, providing stable access across the site.

Both structures were fully submerged during Cyclone Gabrielle. The shorter northern building has been fitted with a new roof following the flood, while the taller building, clad in what appears to be weatherboard, may contain asbestos, although this has not been confirmed. The taller building still shows evidence of silt deposits in its ceiling lights (see photograph 9). The surrounding area has been largely cleared of debris, though stockpiles of logs, an old red flexible hose, and remnants of fencing remain near the site (see photographs 7 and 8).

[2] *Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soils to Protect Human Health) Regulations 2011* (referred to as the NESCS).

3.0 Environmental Setting

The Geological & Nuclear Sciences (GNS) 1:250 000 Geological Map of New Zealand indicates that the site is potentially underlain by Holocene River deposits. The deposits are described as "poorly consolidated alluvial gravel, sand and mud".

A review of the HBRC online well information on 27 August 2024 indicated that the surrounding subsurface geology generally consists of alternating layers of silt, blue/grey clay, blue sand, blue/brown gravel with shells, and peat/vegetation and wood, extending to a depth of at least 250 m. Selected well reports from the area surrounding the site are included in Appendix D, and the locations of the wells are shown in Figure 1.

The site is located within the Heretaunga Plains Aquifer area, and near the confluence of Tūtaekurī River, 350 m to the north, and Ngaruroro River, 200 m to the south. The rivers have influenced the development of flood control structures in the area, including stopbanks and drainage channels. The land between the rivers is primarily agricultural, featuring pastoral farming and cropping. Over time, the rivers have been engineered to divert theirs flow more directly towards the coast, establishing a stable river mouth.

4.0 Desktop Review of Investigation Area History

A desktop assessment was undertaken to provide an overview of any potential contaminants of concern that may be present within the site as a result of any documented past and present activities. The following information was sourced in order to establish the history of the site:

- Historical aerial photograph and images;
- HBRC information; and
- HDC information.

4.1 Historical Aerial Photographs and Images

A desktop review of available historical aerial images was undertaken. Aerial photographs dating from 1949 to 1996 were accessed via the Retrolens website (http://retrolens.nz/) on 26 August 2024 and historical aerial images from 2005 to 2023 were accessed from Google Earth Pro on 27 August 2024. The historical aerial images reviewed are summarised below in Table 2 below. A selection of historical aerial images is also included in Appendix E.

Table 2: Historical Aerial Photography	
1949	The site layout differs from the current configuration, with drainage systems distributed differently. The Ngaruroro River and its stopbanks appear as a network of smaller streams before reaching the sea. The stopbank along the Tūtaekuri River in the site section is similar to the current configuration. A small bridge is located at the current pump station position, crossing streams feeding the Tūtaekuri River from the Ngaruroro River. Surrounding land is vacant, resembling pastoral farming. There is no evidence of a pump station.
1950	The site and surrounding land configuration remain consistent with the 1949 aerial photograph.
1964	A small shed is visible at what is now the general location of the pump station, positioned on the eastern side of the stream near its northern end. Although the layout differs from the present configuration, this shed could potentially be part of an earlier version of the Pakowhai Pump Station. The Ngaruroro River exhibits signs of recent flooding, with a floodplain evident along its southern edge. Earthworks along the Ngaruroro catchments suggest flood control measures were being undertaken.
1969	The Ngaruroro Stream appears redirected south-east at the site. The Tūtaekuri River is now diverted towards the coast, meeting the Ngaruroro River, and creating the current river mouth configuration. Agricultural development is visible to the north of the current pump station location.
1974	The site and surrounding land configuration are similar to that seen in the 1969 aerial photograph.
1977	Agricultural development, including multiple vegetation rows (likely trees), is observed along the stream adjacent to the shed (current pump station location).
1980	The site and surrounding land configuration is similar to the 1977 aerial photograph.
1988	The site appears to have undergone significant upgrades, including the installation of an overhead power line system that runs from the north, crossing the Tūtaekuri River, and extends along the upstream portion of the Ngaruroro catchment near the current pump station. The layout of the pump station seems to have been reconfigured, with the addition of a newly constructed concrete base at the end of the drain. This base includes two small square platforms that align with the current configuration of the two pump houses. The movement of soil, along with the filling of old watercourses and channels, likely made it possible to build the new pump station platform.
1996	The image resolution does not allow for a clear view, but it appears that two buildings are present at the site. Despite this, the surrounding land configuration largely mirrors that of the 1988 aerial photograph.
2003	The site and surrounding land configuration are similar to those in the 1996 aerial photograph. Two buildings appear to be present, matching the current structures on site.
2012	The configuration of the site and surrounding land is similar to that seen in the 2003 aerial photograph.
2015	The configuration of the site and surrounding land is similar to that seen in the 2012 aerial photograph.

Table 2: Historical Aerial Photography	
2021	The configuration of the site and surrounding land is similar to that seen in the 2015 aerial photograph.
2023 (February)	Evidence of damage from Cyclone Gabrielle is visible, including objects resembling earth-moving equipment and land covered in mud and silt. The water in the drains and rivers is heavily sedimented. The northern building appears to be missing its roof or undergoing repairs.
2023 (April)	The site and surrounding land configuration remain similar to the 2021 photograph. The surrounding land is greener, but the water in the Tūtaekuri River remains sedimented. The two buildings at the site resemble the current layout.

4.2 Hawke's Bay Regional Council Information

Two boreholes, 01-PA and 02-PA were drilled approximately 15 m east of the pump station to investigate the shallow geology of the site to a depth of 15.45 m (bgl). These boreholes, drilled by Geotech Drilling and logged by WSP in July 2024, with borehole logs provided by HBRC (copy is included in Appendix F), revealed approximately 4.5 m of fill in borehole 01-PA and 2.0 m in borehole 02-PA. The fill layers generally consisted of silt, sand and gravel. Beneath these, the boreholes generally encountered alternating layers of silt and sand, with minor clay, organic horizons including peat and wood, and fine pumice sand layers. The standing water level, indicating shallow groundwater, was measured at 7.3 m bgl in 01-PA and 2.5 m bgl in 02-PA the day after drilling was completed. (Note: Both boreholes are reported to be located at the same coordinates). The location of the boreholes is also included in Figure 1.

4.2.1 Selected Land Use Register

An online search was made on 27 August 2024 via HBRC website for information from their Selected Land Use Register (SLUR). The HBRC SLUR is used to hold information about sites that have used, stored or disposed of hazardous substances, based on activities detailed on the HAIL (MfE, 2023). It should be noted that the SLUR is not complete and new sites are regularly being added as HBRC receives information or conduct their own investigations into current and historical land uses.

The site is not listed on the SLUR.

An email from HBRC compliance on 2 September 2024 confirmed that the information on the website is correct. A copy of the email is included in Appendix F.

4.2.2 Resource Consents

A review of the HBRC GIS database revealed that there are no resource consents or permits within a 500 m radius of the site boundary. However, within a 600 m radius, it was found:

- **Water Permit** – Indevin Estates Gisborne Limited - to take water from well no. 1450, no. 1489, no. 15284 (100 mm diameter), and well no. 15282 and no. 15283 (75 mm diameter, coupled) to irrigate part of 90 hectares of viticulture – June 30, 2006 (WP060035T).
- **Discharge Permit** – HBRC - to discharge contaminants (drain cleanings) onto land in circumstances which may result in the contaminant (or any other contaminant emanating as a result of natural processes from that contaminant) entering water – October 15, 2004 (DP030449L).

There are no resource consents or permits specifically associated with the site itself. A copy of the listed consents is included in Appendix F.

4.2.3 HBRC Archaeological screeing: Pump Station, Hawkes Bay

In June 2024, Archaeology Hawke's Bay Ltd (AHB) conducted an archaeological risk screening for three proposed replacement pump stations at the request of Hawke's Bay Regional Council (HBRC), including for this investigation site. The screening report concluded that the proposed development does not directly impact any currently recorded archaeological sites. The realignment and redirection of the Tūtaekuri and Ngaruroro Rivers in the past likely destroyed any potential archaeological records that may have existed in the area.

Based on this assessment, the report recommended that the demolition and replacement of the pump station proceed under the Accidental Discovery Protocol (ADP) to address any unexpected archaeological finds during the construction process. A copy of the HBRC Archaeological Screening report is included in Appendix F.

4.3 Hastings District Council Information

4.3.1 Local Government Offical Information and Meetings Act 1987 Request Information (LGOIMA)

A HDC Officer confirmed that they hold no contamination/hazardous activities or pollution incidents registered on their database for the site. Nevertheless, the HDC Officer transferred the request to HBRC, as the Pakowhai Pump Station is their asset.

The email correspondence with HDC is attached in Appendix F.

4.3.2 Landfill Records

The site is not located within an area identified on the HDC plan. The nearest landfill recorded on the map is located approximately 10 km north-west, Ōmarunui landfill, jointly owned by HDC and Napier City Council.

4.3.3 Review of Hastings District Council Property File Documents

A request for the property files for PT PUNINGA 4A3 BLK XII HERETAUNGA SD INT IN & SUBJ TO R O W on the HDC website, indicated no match in the database.

5.0 Summary of Investigation Area History

The available historical information for the site shows it has been used as part of a drainage system since at least 1949. There appears to have been a structure resembling a shed on the site since 1964. This shed could potentially be part of an earlier version of the Pakowhai Pump Station. Agricultural development is visible to the north of the current pump station location.

Over time, the redirection of the Ngaruroro and Tūtaekuri Rivers has shaped the current river alignment and mouth configuration, which has remained approximately unchanged since 1969.

The location of the shed changes between 1980 and 1988, and the site appears to have undergone significant upgrades, including the installation of an overhead power line system. During this time the shed has moved to a location similar to its current location.

The bore log for borehole 01-PA indicated approximately 4.5 m of predominantly silt fill at the top of the borehole. Based on historical imagery and observed modifications to the Ngaruroro River corridor, it is possible that this material was either man-placed to shape the new building platform or represents natural flood-deposited silt over old channels. Similarly, the bore log for borehole 02-PA recorded 1.5 m of predominantly gravel fill at the surface. Observations during the site visit confirmed the presence of sandy gravel, suggesting this material may have been used as a base for the pump station footprint.

Based on the time frames, it is possible that initially the pumps in the pump station required fuel to operate and this fuel may have been stored onsite, beside the buildings. It was also observed that the pump station buildings are old and has cladding that may contain asbestos. It is also possible that lead paint may have been used during the life of the buildings.

The surrounding land use has been predominantly rural, including horticulture and viticulture, since at least 1949. Historical aerial photographs suggest that properties north of the site have been used for horticultural purposes since at least 1969. Resource consents within 600 m of the site indicate water permits for irrigating approximately 90 hectares of viticulture. The use of water for spraying suggests that pesticides may have been applied to the horticultural land.

One of the significant recent changes to the site occurred during Cyclone Gabrielle in February 2023, when the entire site and surrounding area were inundated. According to anecdotal reports from HBRC staff, floodwaters rose to about 2-3 m at the peak of the cyclone, submerging both buildings on the site.

The aerial images from after Cyclone Gabrielle indicate that flood waters flowed through the site and surrounding land before finally draining out through the pump station. This would have had the effect of transferring and dispersing materials from around the catchment to other sites and into the drainage system. It also resulted in a layer of silt being spread on the site and surrounding land.

Based on the available information, the potential contamination sources from past and present land use activities may be restricted to the following for the overall site:

- '*Landfill* sites' (HAIL G3) - for the deposition of uncharacterised fill associated with the boreholes 01-PA & 02-PA.
- *'Any land that has been subject to the migration of hazardous substances from adjacent land in sufficient quantity that it could be a risk to human health or the environment'* (HAIL reference H) – associated with the movement of materials from adjacent agricultural and horticultural/viticultural sites by flood water and to a lesser degree wind (spray drift).

These two possible HAIL activities would need to be confirmed through a soil sampling investigation. In addition to the two above identified possible HAIL activities, noting the age of the pump station buildings, the possibility exists for them to contain asbestos (possible HAIL activity E1, if present and noted to be in poor condition) as part of their building fabric and also to contain lead paint (possible HAIL activity I), and for these contaminants to impact the surrounding site soils in sufficient quantity to pose a risk to human health. These possible HAIL activities would need to be confirmed through undertaking further investigation at the site including an assessment of the building materials and adjacent site soils. Whilst noting these possible HAIL activities, it should be noted that the flooding and clean up from Cyclone Gabrielle may have moved much of the original soils that may have contained any asbestos and/or lead paint residues historically released from the buildings.

The primary contaminants of concern associated with the identified HAIL activities over the site include (but not necessarily limited to) heavy metals, Organochlorine Pesticides (OCPs) and asbestos.

With regard to contaminants associated with Cyclone Gabrielle, it is possible for a wide array of contaminants to be present within site soils above local background concentrations.

6.0 Consideration of the NESCS

The NESCS seeks to control activities on contaminated land so as to protect human health. The regulations apply to land, which is described as having, has had or is more likely than not to have had an activity or industry described in the HAIL undertaken on it. As mentioned in Section 5.0 of this letter, possible HAIL activities have been identified within the site. Therefore, under regulation 5(7), the NESCS regulations need to be taken into consideration for the proposed redevelopment.

The NESCS sets outs regulations for the following activities as described in sub-clauses (2) – (6) of regulation 5:

2) *An activity is removing a fuel storage system from the piece of land or replacing a fuel storage system in or on the piece of land.*

3) *An activity is sampling the soil of the piece of land, which means sampling it to determine whether or not it is contaminated and, if it is, the amount and kind of contamination.*

4) *An activity is disturbing the soil of the piece of land.*

5) *An activity is subdividing land.*

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

Based on the proposed development, the NESCS may apply to soil disturbance (sub-clause 4 above).

6.1 Soil Disturbance

Soil disturbance is a permitted activity under regulation 8(3) provided that controls are put in place to minimise contact with soil during the disturbance, that the soil be reinstated to an erosion-resistant state within one month of completion of the works and that disposal of removed soil is at a facility authorised to receive such waste. The NESCS also sets limits on the volume of soil disturbance (no more than 25 m^3 per 500 m^2 is disturbed), soil removal (no more than 5 m^3 per 500 m^2 is removed from the site (property) per year) and duration of works (no longer than two months).

Currently, no specific plans have been provided to detail the duration of earthworks and exact volume of soil disturbance involved to upgrade the pump station. Once this has been established, an assessment can then be made with regards to whether the bulk earthworks can be completed as a permitted activity in accordance with the NESCS regulations. Discussions with HBRC indicated that it was likely that excess soil from the upgrade would be transported offsite to HBRC storage sites.

6.2 NESCS Consenting Summary

Based on a review of the available site history information, and due to the presence of possible HAIL activities at the site, a potential risk exists to human health. If the upgrade works are unable to meet the permitted activity requirements for soil disturbance, then further assessment (e.g. soil sampling investigation) maybe required. Irrespective, a soil sampling investigation may be required to characterise the soils to be excavated to inform offsite disposal requirements and health and safety management measures for site contractors and future site occupiers.

7.0 Conclusions

PDP has reviewed site history information for the Pakowhai Pump Station, located on the property legally described as PT PUNINGA 4A3 BLK XII HERETAUNGA SD INT IN & SUBJ TO R O W. (i.e., the site). The objective of the investigation was to identify any potential HAIL activities/sources of contamination from past and/or present land use activities at the site and to assess compliance with the NESCS for the upgrade of the pump station.

The investigation included a review of available site history information including historical aerial photographs, HDC and HBRC information, and a site walkover.

In summary, the available historical information for the site shows that it has been used as part of the drainage system since at least 1949. Since around 1964, a shed has been on the site and could potentially be part of an earlier version of the current Pakowhai Pump Station. The pump station was upgraded between 1980 and 1988 based on the changes noted in the aerial photographs. The surrounding land use has been predominantly rural/horticultural/viticultural.

Cyclone Gabrielle in February 2023 inundated the site, submerging both pump station buildings and leaving the area covered in a layer of silt. The northern building required roof repairs due to the extent of the flooding.

Through the process of this review, potential HAIL activities have been identified at the site, as follows:

- HAIL reference G3 - for the presence of either imported fill or deposition as a result of Cyclone Gabrielle.
- HAIL reference H - associated with the movement of materials from adjacent agricultural/horticultural/viticultural sites by flood waters and/or wind (spray drift).

The above HAIL activities would need to be confirmed through a soil sampling investigation. In addition to the two above identified HAIL activities, it is possible that the site soils contain other contaminants above local background concentrations, primarily as a result of the effects of Cyclone Gabrielle.

Based on a review of the available site history information, and due to the presence of likely HAIL activities at the site, a potential risk exists to human health. If the pump station upgrade works are unable to meet the NESCS permitted activity requirements for soil disturbance, then further assessment (e.g. soil sampling investigation) maybe required. Irrespective, a soil sampling investigation may be required to characterise the soils to be excavated to inform offsite disposal requirements and health and safety management measures for site contractors and future site occupiers.

8.0 References

Archaeology Hawkes Bay, June 2024. *HBRC Archaeological Screening: Pump Stations, Hawke's Bay*.

GNS Science. (2012). Geological Map of New Zealand [Data set]. GNS Science.

Ministry for the Environment. 2023. *Hazardous Activities and Industries List guidance: Identifying HAIL land*. Wellington: Ministry for the Environment.

Ministry for the Environment, 2021. *Contaminated Land Management Guidelines No. 1: Reporting on Contaminated Sites in New Zealand (Revised 2021)*. Ministry for the Environment, Wellington.

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

9.0 Limitations

This letter has been prepared by Pattle Delamore Partners Limited (PDP) on the specific instructions of Hawke's Bay Regional Council for the limited purposes described in the letter. PDP accepts no liability if the letter is used for a different purpose or if it is used or relied on by any other person. Any such use or reliance will be solely at their own risk.

This letter has been prepared on the basis of information provided by Hawke's Bay Regional Council and others (not directly contracted by PDP for the work), including Hastings District Council. PDP has not independently verified the provided information and has relied upon it being accurate and sufficient for use by PDP in preparing the letter. PDP accepts no responsibility for errors or omissions in, or the currency or sufficiency of, the provided information.

Owing to the limited nature of this assessment (as described in the Introduction), there may be soil and/or groundwater contamination conditions at the site that have not been identified and which have not been considered in this letter. The associated risk may be able to be reduced by undertaking further research or subsoil investigation.

Yours faithfully

PATTLE DELAMORE PARTNERS LIMITED

Prepared by

pp

Nicole Bidart

Environmental Scientist

Reviewed by

Sally McKinnon

Service Leader - Contaminated Land

Approved by

Guy Knoyle
Technical Director - Contaminated Land

Appendix A - Certifying Statements

I, Guy Knoyle of Pattle Delamore Partners Limited, certify that:

1. This preliminary site investigation meets the requirements of the *Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011* (the NESCS) because it has been:
    a. done by a suitably qualified and experienced practitioner, and
    b. reported on in accordance with the current edition of *Contaminated land management guidelines No 1 – Reporting on contaminated sites in New Zealand*, and
    c. the report is certified by a suitably qualified and experienced practitioner.
2. This preliminary site investigation concludes that the NESCS regulations are considered to be applicable for the activities covered by the NESCS (i.e. soil disturbance) associated with the upgrade of the pump station.

Evidence of the qualifications and experience of the suitably qualified and experienced practitioner who has done this investigation and certified this report is provided below.

This certification applies to the date of this report.

Signed

Guy Knoyle

Technical Director – Contaminated Land

Guy Knoyle – Project Director

Guy is an environmental scientist with over 29 years of experience in undertaking environmental and contaminated land assessments. He has a BSc (Joint Honours) in Environmental Science and Zoology, and a MSc in Applied Hydrobiology, both from the University of Wales, College of Cardiff. Guy currently project manages contaminated land assessments and monitoring programmes for a diverse range of sites including commercial/industrial and largescale residential developments, former market gardens, horticultural and timber treatment sites, pesticide storage depots, landfills, the petroleum industry, former gas works sites and illicit methamphetamine laboratories, with experience attained over several hundred sites.

Guy has experience involved in a wide range of environmental issues, across a broad range of media including soil, sediment, surface water, groundwater, and ground gas; and for a wide range of contaminants including heavy metals, petroleum hydrocarbons, and asbestos.

Guy's knowledge has also allowed him to present technical evidence on behalf of various clients, as part of a multi-disciplinary team, at District Court, High Court and Environment Court mediation and at numerous joint territorial and regional authority hearings.

Guy has familiarity with and understanding of the current contaminated land regulation and practice in New Zealand including assessments against the NESCS, and in the consenting of contaminated sites.

Appendix B – Figure

0 50 100
METRES
SCALE : 1:5,000 (A3)

NO.	REVISION	DATE	BY
B	FINAL	SEPT 24	KB
A	ISSUED FOR REVIEW	SEPT 24	KB

SOURCE:
1. AERIAL IMAGERY (FLOWN FEB 2024) DERIVED FROM GOOGLE EARTH PRO (MAY NOT BE SPATIALLY ACCURATE).
2. CADASTRAL/TOPOGRAPHICAL INFORMATION AND INSET DERIVED FROM LINZ DATA.
3. HBRC DRAIND AND HAIL ZONES SOURCED FROM HBRC OPEN DATA ACCESS 30.08.24.

CLIENT
HAWKE'S BAY REGIONAL COUNCIL

FIGURE
FIGURE 1: SITE LOCATION

PROJECT
PRELIMINARY SITE INVESTIGATION: PAKOWHAI PUMP STATION

Appendix C – Site Photos

Photograph 1: View from the western section of the site, looking south-west towards the two buildings that make up the pump station.

Photograph 2: View from the western edge of the pump station building platform, looking towards the eastern building (taller) with the stopbank in the background.

Photograph 3: View facing the western pump station building.

Photograph 4: View from the edge of the pump station's concrete slab, looking south-west along the main drain channel adjacent to the pump station.

Photograph 5: View of the overhead power lines running south-west along the edge of the main drain channel, supplying power to the pump station.

Photograph 6: Overhead cables connected to the taller pump station building.

Photograph 7: The area has been largely cleared of Cyclone Gabrielle silt, with some stockpiled logs adjacent to the site, along with small stockpiles of an old red hose and remnants of old fencing.

Photograph 8: Pile of old fencing remaining from Cyclone Gabrielle nearby the site.

Photograph 9: Interior of the taller pump station building, showing remaining wetness on the ceiling from the flood.

Appendix D – Well Information

Well 1489

IDENTIFICATION		WELL INFORMATION	
WQ Site	1887	**Drill Date**	02/07/1983
NZTM Easting	1934405.714	**Driller**	Hill Well Drillers Ltd
NZTM Northing	5612503.961	**Casing Diameter (mm)**	100
Method	Hand-held GPS	**Bore Depth (m)**	
Address	SISSONS RD (L/C)	**Well Depth (m)**	50.9500007629395
		Screen top (m)	
		Screen bottom (m)	
		Open hole top (m)	
		Open hole bottom (m)	
		Water access	Unknown

Aquifer Information

Initial Water Level	0
Initial Water Level Date	
Aquifer Lithology	Unknown
Aquifer Condition	Flowing confined
Comments	Permit number is 1489 Metric Grid Reference : V21:7.3 189085 Driller is HILL Owner is CORNERS P H Well location is SISSONS RD Legal description is LOT 2 DP 15447 BLK X11 HERETAUNGA SD General remarks : FF 1824l/min Screen type is 2.0m DRILLED PIPE

Aquifer Test

Test Date	02-07-1983
Report Number	
Maximum Pumping Rate (l/s)	
Maximum DrawDown (m)	
Duration (hours)	
Number Of Pumping Steps	

Well 1489

Aquifer Thickness (m)	
Transmissivity (m^2/d)	
Storativity	
Hydralic Conductivity (m/d)	
Specific Capacity ((l/s)/m)	

Bore Log

From Depth (m)	To Depth (m)	Lithology
0	2.8	TOPSOIL
2.8	4.6	brown CLAY (loose)
4.6	8.2	grey CLAY (loose)
8.2	8.8	PEAT/VEG/WOOD
8.8	10.3	grey CLAY
10.3	11.7	black SAND with shell
11.7	34	blue CLAY
34	35.2	SAND
35.2	47	CLAY with sand
47	48	blue/brown GRAVEL with sand
48	50.95	blue/brown GRAVEL

Well 3699

IDENTIFICATION		WELL INFORMATION	
WQ Site	2137	**Drill Date**	07/12/1994
NZTM Easting	1935268.432	**Driller**	Hill Well Drillers Ltd
NZTM Northing	5612896.631	**Casing Diameter (mm)**	50
Method	Differential GPS	**Bore Depth (m)**	254
Address	Ngaruroro/Tutakuri stop bank	**Well Depth (m)**	220.800003051758
		Screen top (m)	220.300003051758
		Screen bottom (m)	220.800003051758
		Open hole top (m)	
		Open hole bottom (m)	
		Water access	Unknown

Aquifer Information

Initial Water Level	
Initial Water Level Date	
Aquifer Lithology	
Aquifer Condition	
Comments	This well was drilled on a mound constructed on top of a stopbank. The level on top of the mound (16.4m amsl) was the datum used for drilled depths initially. After completion of drilling the mound was removed and the ground level restored to 6.534m am

Aquifer Test

Bore Log

From Depth (m)	To Depth (m)	Lithology
0	6.5	FILL
6.5	14.5	brown/grey SILT with peat/veg/wood (fluvial, 1180 years before present)
14.5	24.5	grey SILT with peat/veg/wood/sand/shell (marine, lagoonal, estuarine, 5660 to 6200 ybp)

HAWKE'S BAY REGIONAL COUNCIL

Well 3699

24.5	36	grey SILT with clay/peat/veg/wood/shell (6922 to 8320 ybp)
36	49.3	poorly sorted blue GRAVEL with peat/veg/wood/sand (post glacial fluvial, 8350 to 9195 ybp)
49.3	60	poorly sorted blue GRAVEL with sand/silt (post glacial fluvial, 9195 to 10247 ybp)
60	64.5	brown GRAVEL with sand/silt (c 14000ybp?)
64.5	86.5	brown GRAVEL with clay/sand/silt (clayey silt is yellow/brown, increasing downward)
86.5	87.4	brown/yellow SILT with clay
87.4	90.8	brown GRAVEL with sand/silt (sandy silt is yellow/brown)
90.8	95.5	blue/grey SILT with clay/peat/veg/wood (carbonaceous)
95.5	108	brown GRAVEL with clay/sand/silt (clayey silt is yellow/brown)
108	109	blue/grey SILT
109	112.5	brown/grey GRAVEL with sand/silt (silt is yellow/brown, c70000ybp)
112.5	117.5	blue/grey GRAVEL with limestone/sand/shell/silt
117.5	128.2	blue/grey CLAY with peat/veg/wood/silt (carbonaceous)
128.2	132	grey GRAVEL with sand/silt
132	155.5	grey SILT with clay/peat/veg/wood/silt (carbonaceous, bottom c120000ybp)

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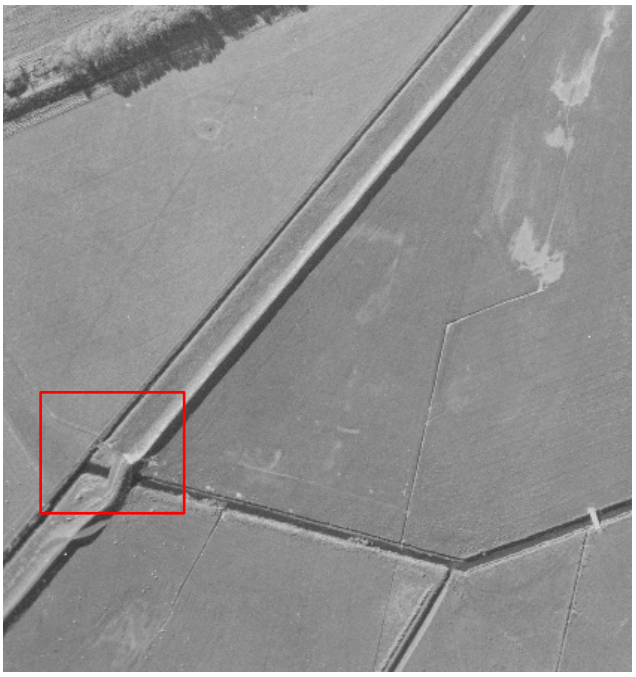
Well 3699

155.5	163.6	black/blue GRAVEL with peat/veg/wood/sand/silt
163.6	175	grey GRAVEL with clay/peat/veg/wood/silt (glacial period)
175	176.3	grey GRAVEL with sand/silt
176.3	187	blue/grey CLAY with peat/veg/wood/silt (c200000ybp)
187	223.3	grey CLAY with peat/veg/wood/sand/silt
223.3	226	grey GRAVEL with peat/veg/wood/sand/silt
226	230	blue/grey CLAY with silt
230	249.5	grey GRAVEL with limestone/sand/shell/silt
249.5	254	brown/grey GRAVEL with sand/silt (sandy silt is yellow, c250000ybp? Glacial fluvial)

Appendix E – Historical Aerial Photographs and Images

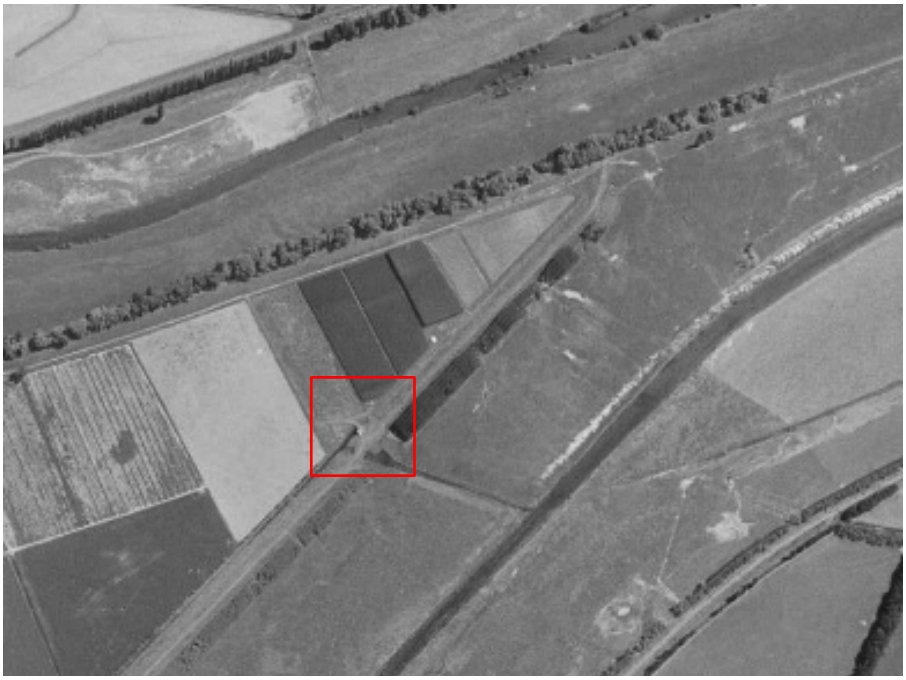


Historical Aerial Photograph: 16 May 1949 (Source - Retrolens). The site is highlighted in red.

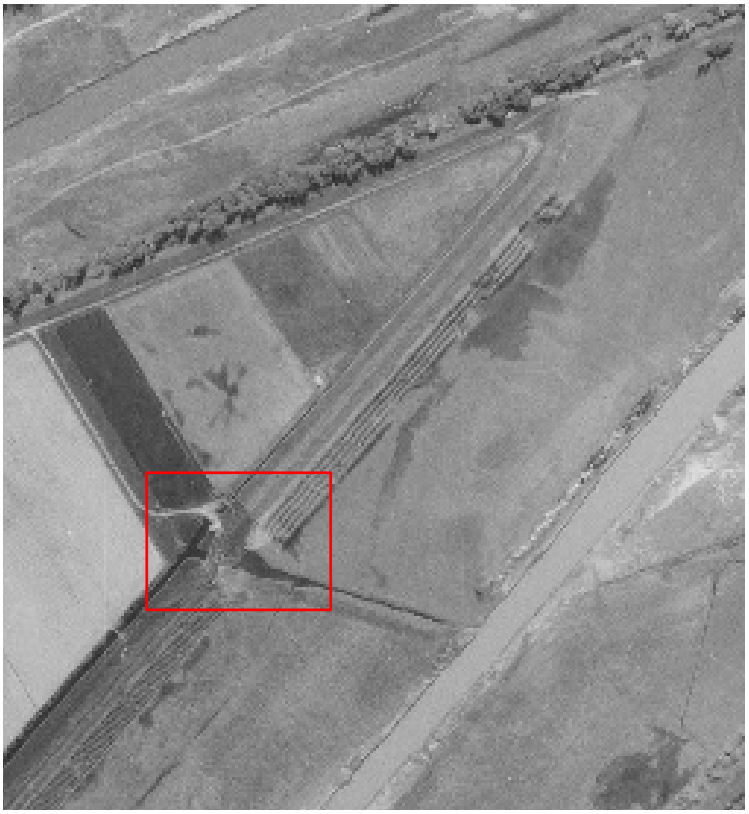
Historical Aerial Photograph: 21 September 1950 (Source - Retrolens). The site is highlighted in red.

Historical Aerial Photograph: 5 September 1964 (Source - Retrolens). The site is highlighted in red.

Historical Aerial Photograph: 4 August 1969 (Source - Retrolens). The site is highlighted in red.

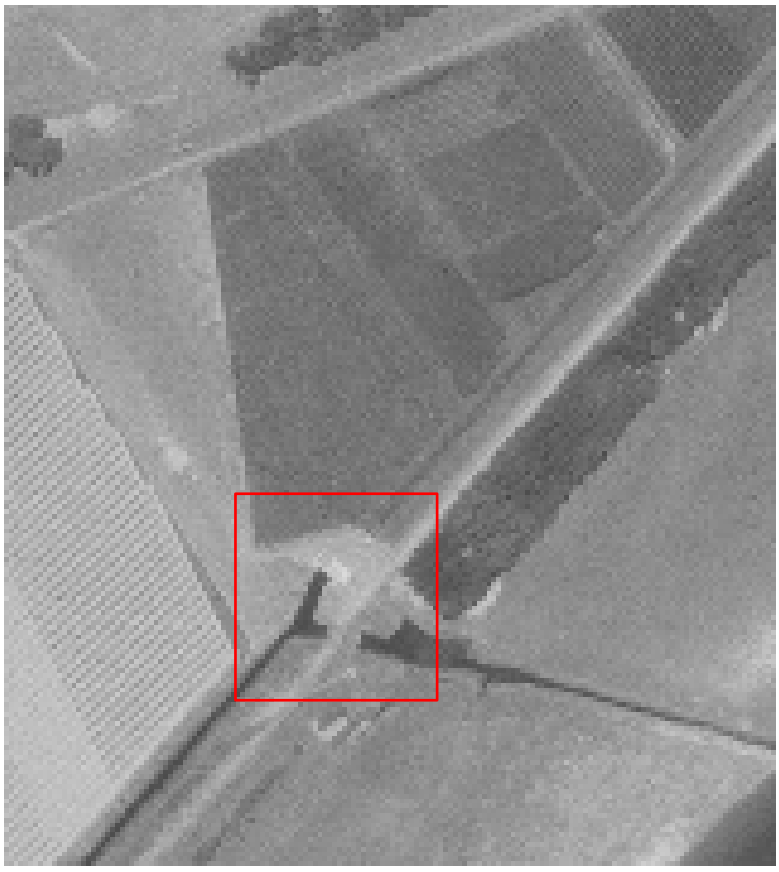


Historical Aerial Photograph: 16 January 1974 (Source - Retrolens). The site is highlighted in red.



Historical Aerial Photograph: 29 September 1977 (Source - Retrolens). The site is highlighted in red.

Historical Aerial Photograph: 19 August 1980 (Source - Retrolens). The site is highlighted in red.



Historical Aerial Photograph: 26 November 1988 (Source - Retrolens). The site is highlighted in red.

Historical Aerial Photograph: 17 December 1996 (Source - Retrolens). The site is highlighted in red.

Historical Aerial Image – January 2003 (Source – Google Earth Pro). The site is highlighted in red.

Historical Aerial Image – **September 2012** (Source – Google Earth Pro). The site is highlighted in red.

Historical Aerial Image – **May 2015** (Source – Google Earth Pro). The site is highlighted in red.

Historical Aerial Image – **December 2021** (Source – Google Earth Pro). The site is highlighted in red.

Historical Aerial Image – **19-20 February 2023** (Source – LINZ). The site is highlighted in red.

Historical Aerial Image – **April 2023** (Source – Google Earth Pro). The site is highlighted in red.

Appendix F – Hawke's Bay Regional Council and Hastings District Council Information

HBRC ARCHAEOLOGICAL SCREENING: PUMP STATIONS, HAWKE'S BAY

LEGISLATION

Under the current legislation (HNZPTA 2014) all archaeology is protected. This includes both recorded archaeology (that which we know is present) and unrecorded archaeology (that which remains to be formally identified).

PRELIMINARY SCREENING

This document is a high-level desk top screening only. It does not constitute a full Archaeological Assessment of Effects and at time of initial release did not involve a site visit UNLESS a Site Visit section is presented. The purpose of the screening is to help the recipient in determining the appropriate or legally required archaeological inputs during the preliminary planning stages of the screened project(s). At the completion of each project screening a progression recommendation is made, based on the information presented and the archaeologists' understanding of the potential risks. It is the recipient's responsibility to follow the advice and recommendations made.

BACKGROUND

An archaeological risk screening of three proposed replacement pump stations has been requested from Archaeology Hawke's Bay Ltd (AHB) by J.P. Neethling for Hawke's Bay Regional Council (HBRC).

LOCATION

This screening relates to the following pump station sites:

- Awatoto
- Brookfields
- Pakowhai

Locations of the three pump stations in broad context.

PROPOSED WORK

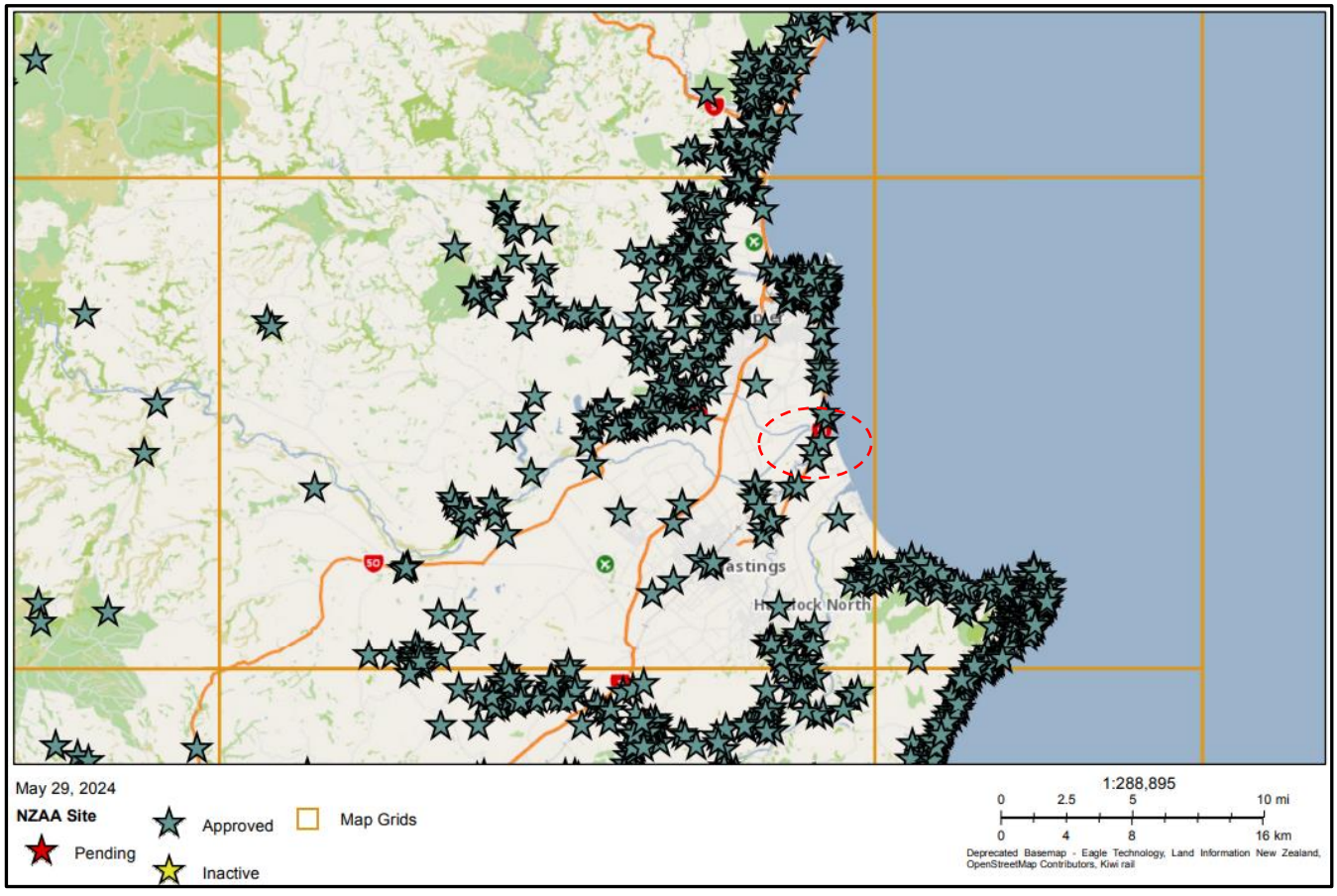
The proposed work involves the demolition of the existing pump station building(s) at each location and the construction of two new buildings per location (as provided by J.P. Neethling via e-mail 15/05/2024).

- Building 1: foundation (approximately) 13 m x 4.5 m x 4.5 m deep
- Building 2: foundation (approximately) 14 m x 7 m x 1 m deep (excluding pile depths)
- General earthworks: excavation of foundations to indicated depths and introduction of introduced fill- note depths remain subject to geotechnical confirmation so may go deeper or shallower. Further cut and fill earthworks to an unspecified extent will be required to create access platforms.

OVERVIEW OF ARCHAEOLOGICAL POTENTIAL

Traditionally river corridors and river mouth environments were utilized for resource gathering and as transportation routes, either by foot or waka. Prior to and since Cyclone Gabrielle there have been several instances of archaeological sites having been encountered at significant depth below current ground levels (> 1 m) along river or stream corridors e.g. during the Whakatū Arterial Link project (V21/464, V21/463, V21/465, V21/461, V21/462) and during the Springfield Stopbank repairs (V21/531)

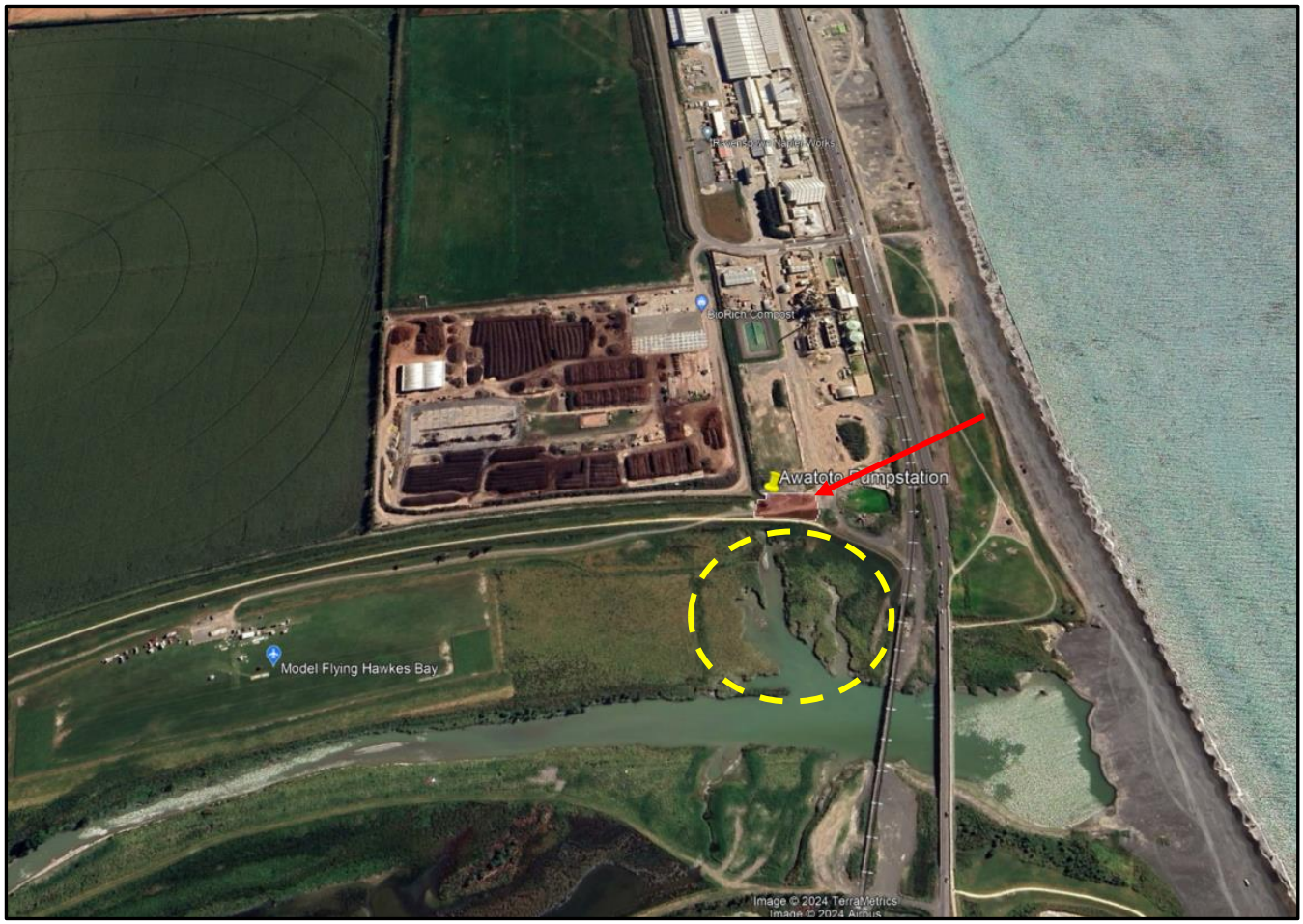
These pump stations lie adjacent to the present day Tutaekuri and Ngaruroro Rivers. These rivers are in places much modified from their pre 1900 course, with three now essentially exiting at the one river mouth. Therefore, the location, size and form of the current rivers cannot be assumed to closely reflect that of the pre-1900 environment. Further, because of Cyclone Gabrielle (Feb 2023) the river mouth area was significantly altered with gouging of banks and the creation of numerous new inlets.



Wider archaeological landscape of proposed pump station projects (red dash) (ArchSite).

AWATOTO PUMP STATION

The Awatoto pump station is located adjacent to the Tutaekuri, Ngaruroro and Clive River mouth. This area has been considerably modified by industrial activity throughout the 20th Century and has also been impacted by river redirection work. During Cyclone Gabrielle the Awatoto area was significantly impacted by the volume of water from three flooding rivers being funneled to this one exit point. The physical changes to the river mouth include newly formed inlets gouged out during the flooding (see below).



Awatoto Pump Station location in local context, arrowed red shade indicated project area, yellow dash = newly formed inlets (Google Earth Pro & kmz data provided by J.P. Neethling).

ARCHSITE

There are two currently recorded archaeological sites within approximately 300 m of the proposed replacement Awatoto pump station:

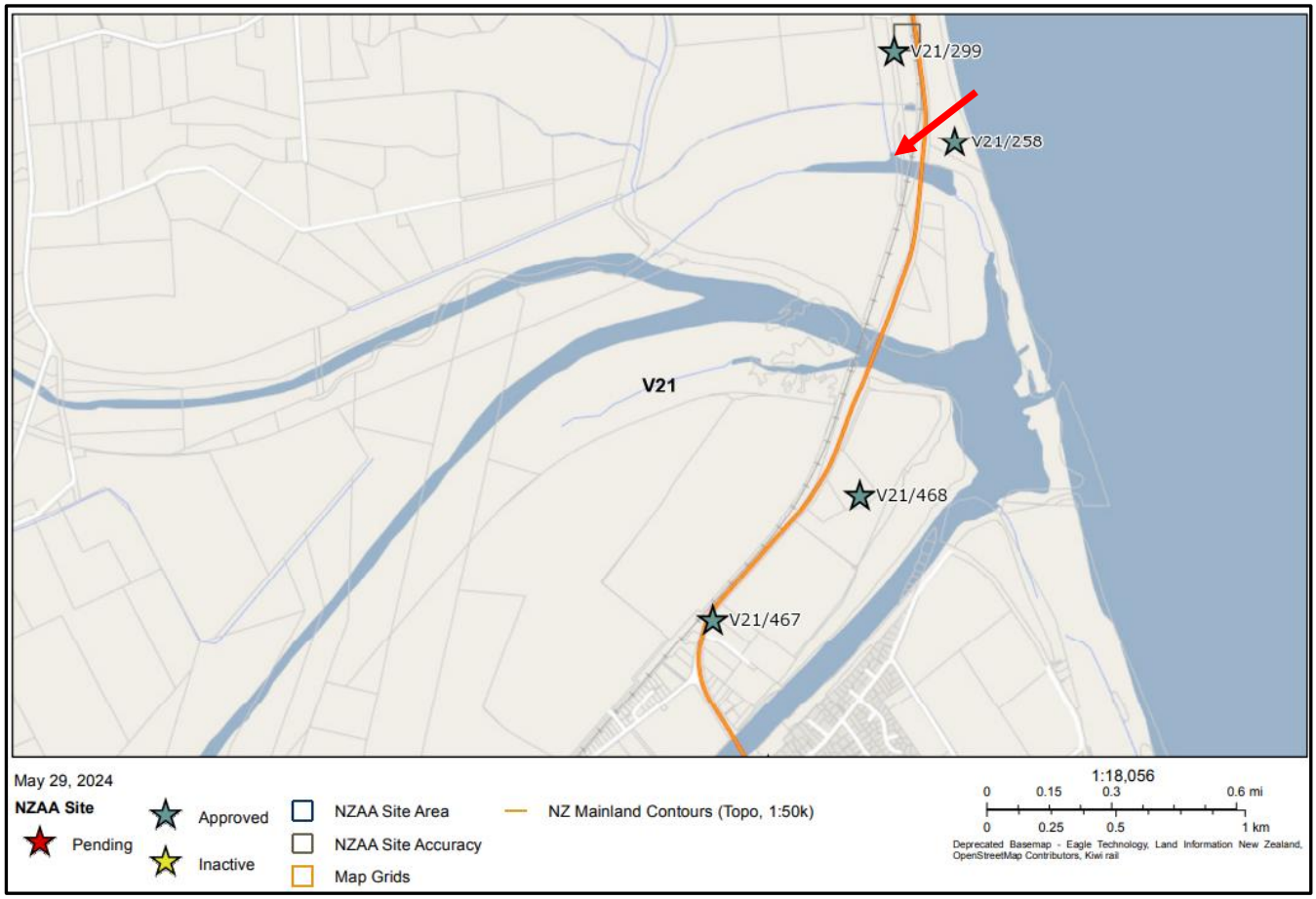
V21/258 – WWII Pillbox

V21/299 – Te Awapuni Pā, chapel and burial ground associated with William Colenso's mission

station.

Recorded site V21/258 is a WWII military pillbox, is observable from the surface and has a highly defined and localized footprint. This archaeological site will not be impacted by the proposed work.

Recorded site V20/299 is described as Te Awapuni Pā and is recorded as having a chapel and burial ground that are associated with William Colenso's mission station. This would suggest that this is potentially an extensive site as pā often had activity areas much more expansive than the pā palisades or defenses might indicate. The additional chapel and burial ground potentially extended this site further. However, this site is recorded from historic documents only, there is no physical evidence at the surface, and aside from anecdotal records of human remains being encountered during work at the Ravensdown factory (mid – late 20th C?), no archaeological evidence of the pā, chapel or burial ground has been recovered to date.

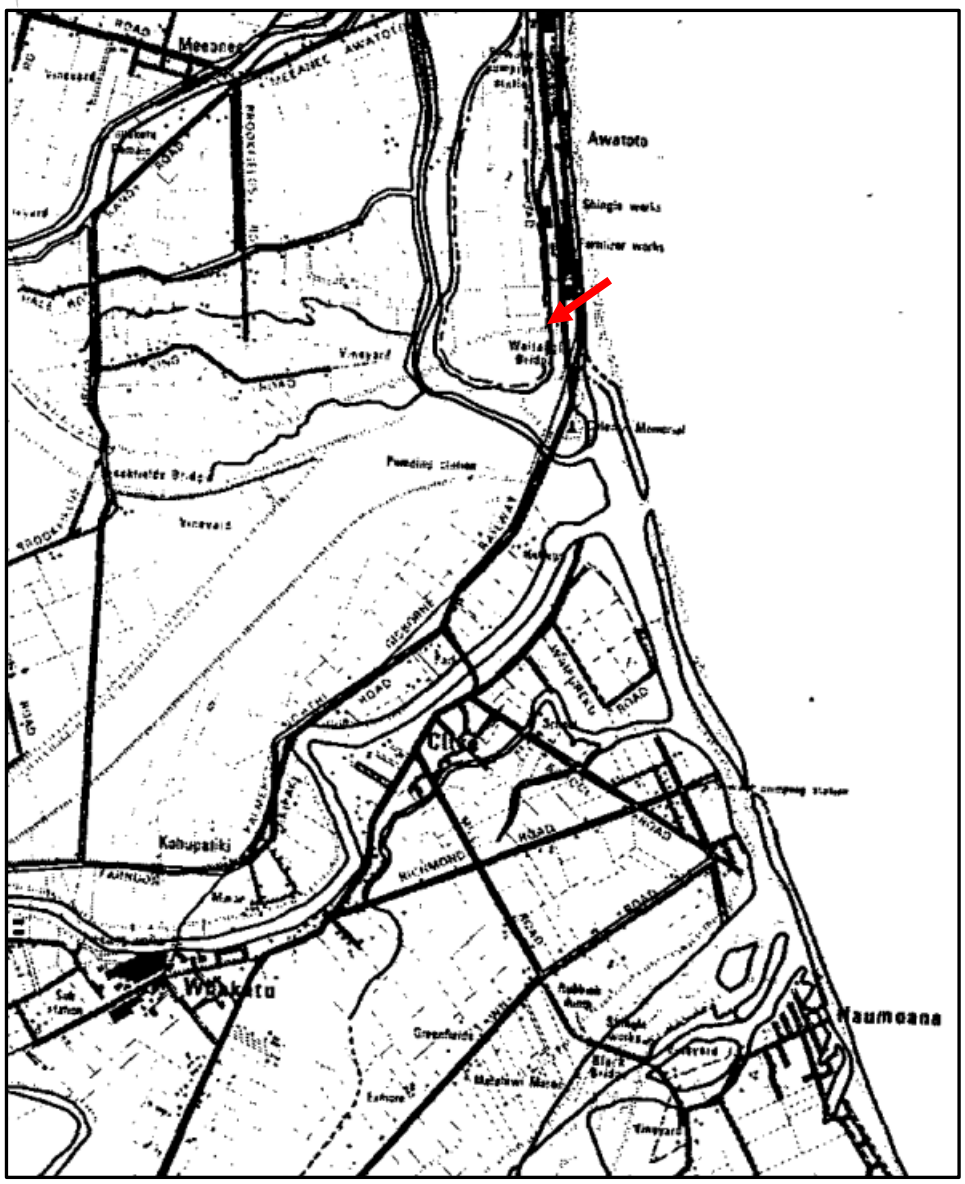


Archsite excerpt showing the recorded archaeological sites in the immediate vicinity of the pump station location (arrowed).

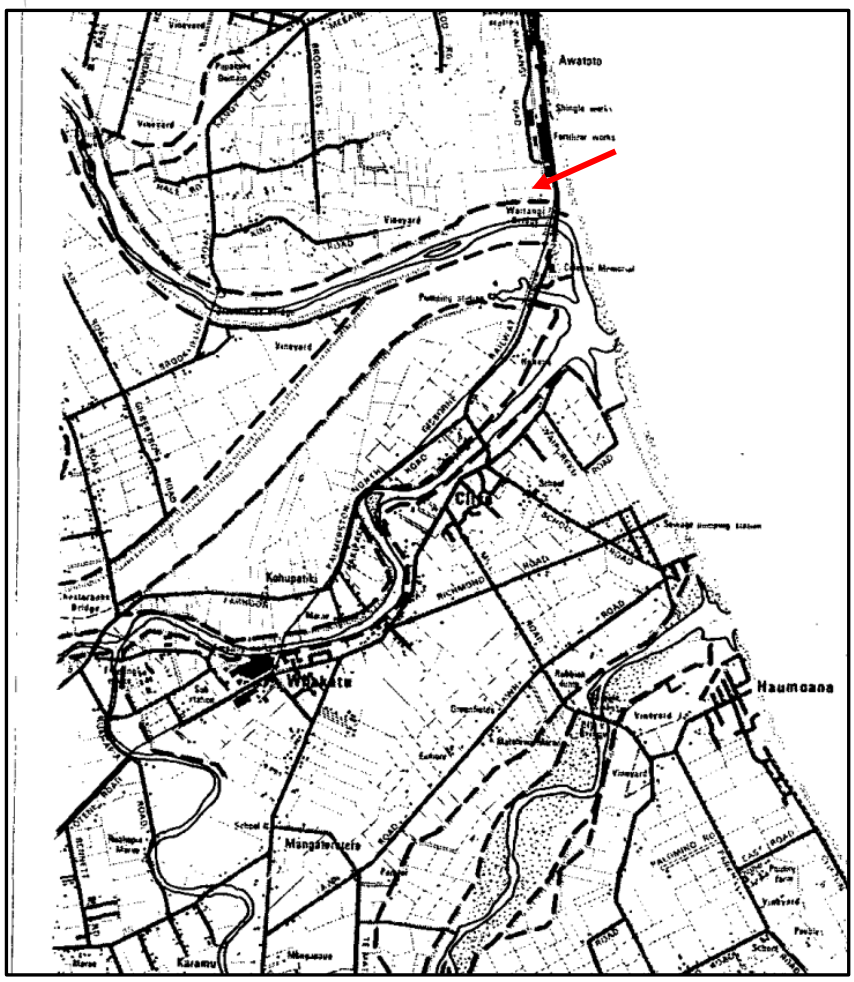
HISTORIC MAPS

Historic maps are very useful for understanding past landscapes, especially in areas such as this where river courses have been significantly modified both by natural and engineered means. A series of Hawke's Bay Rivers Board map excerpts included in the V21/299 Site Record form shows the changes to the river mouth and river corridors between 1875 and 1990. In 1875 there were multiple streams and three major rivers: Ngāruroro, Clive and Tukituki all feeding into an extensive long narrow estuary running from the Waitangi Bridge to Haumoana, separated from the sea by a narrow gravel bar.

By 1958 the Tutaekuri had been diverted to its current path and the proposed Ngaruroro diversion had been seemingly confirmed. The extensive estuary had been closed off with one river mouth for the Tutaekuri and Clive Rivers between Waitangi Bridge and Clive; and a second for the Tukituki at Haumoana.



Hawke's Bay Rivers Board plan excerpt showing 1875 rivers and coastal environment in the Awatoto to Haumoana area, project area arrowed.



Hawke's Bay Rivers Board plan excerpt showing 1958 rivers and coastal environment in the Awatoto to Haumoana area, project area arrowed.

HISTORIC AERIAL IMAGES

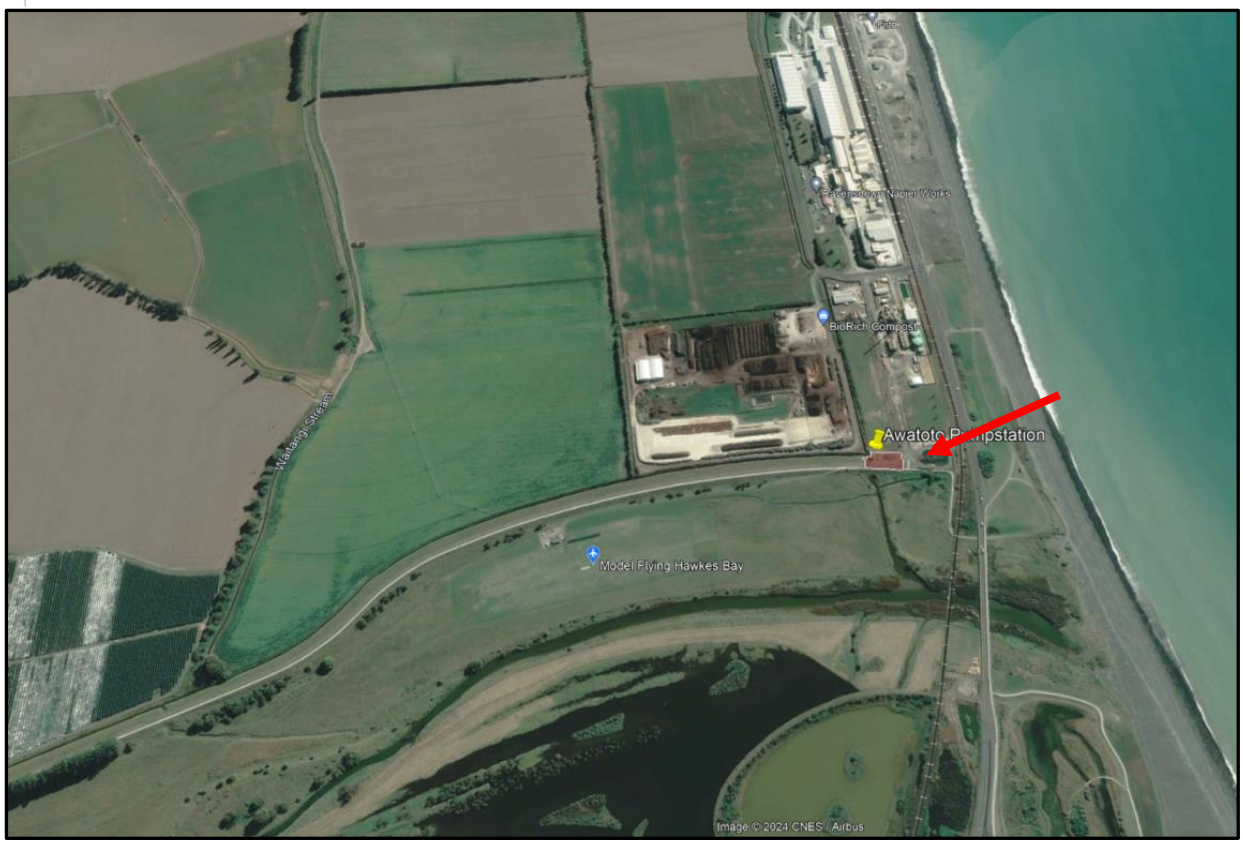
Several Retrolens historic aerial images dating from the 1930s to 1990s were scanned for information relating to the recent history of modifications to the pump station location and for potential unrecorded archaeological sites that might be affected by the proposed work. The earliest images of use found were from 1939 and shows the area prior to the major industrial activity of the 20th C. and during a flood event. By this time the river mouth stopbanks had been formed and the wetland, river and stream channels closest to the pump station appear largely consistent with those up until Cyclone Gabrielle. There was no indication in any of the images of unrecorded archaeology or features that might be associated with V21/299.

Awatoto area and river mouth within 1939 flood landscape (Retrolens taken 15/06/1939).

Indicative location of proposed work within 1939 landscape (Retrolens).

Indicative location of proposed work within 1969 landscape (Retrolens).

Indicative location of proposed work within 1980 landscape (Retrolens).

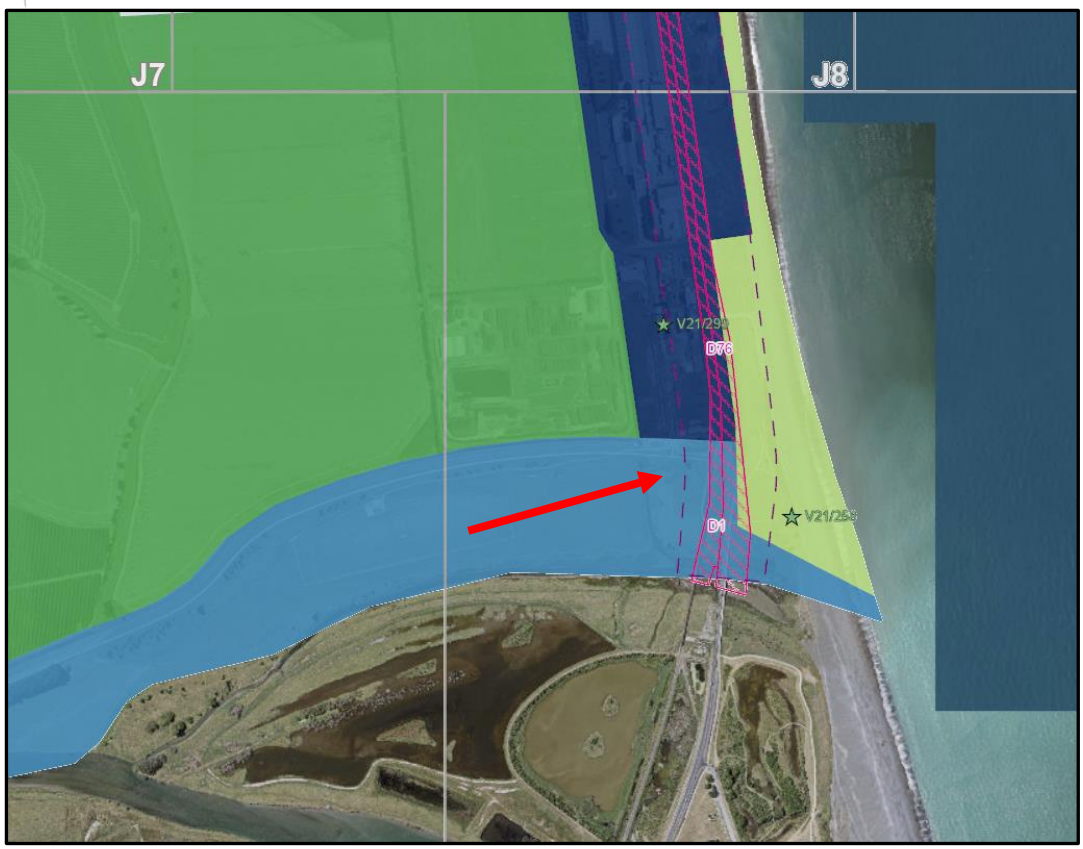


Location of proposed work within 2021 landscape (GoogleEarthPro).

DISTRICT PLANS

The area of proposed work lies within the Napier City Council region and is zoned as River Conservation. There are no items of cultural or historical significance aside from the two recorded archaeological sites, identified in the immediate area on the Operative District Plan[1].

[1] https://napier.isoplan.co.nz/eplan/property/0/0/42



Indicative location of proposed work (arrowed) in relation to NCC District Plan.

DISCUSSION

The proposed replacement pump station has two recorded archaeological sites within approximately 300 m. One, V21/ 258, is known to be outside the area of proposed work. Recorded site V21/299 has not had any surface or subsurface indicators identified since it's recording based on historic documents. Although this site is potentially sufficiently large that it could have extended to the area of proposed work, there is no evidence to suggest this to date. Unfortunately, the flood history of the Heretaunga Plains has obscured from view the types of surface archaeological indicators that are usually seen such as dips, hollows and banks; and materials such as burnt stone, shell, ceramic and glass. Over the past 5 – 10 years there has been an increasing realization that much of the archaeology of the Heretaunga Plains is buried beneath past flood depositions. Where earthwork is limited to the upper 300 – 500 mm of ground these archaeological horizons may not be revealed and remain intact beneath the modern landscape. However, where deeper foundations, footprints or excavations are required these archaeological horizons can unexpectedly be revealed.

SUMMARY STATEMENT

The proposed work does not directly impact any currently recorded archaeology. Nor is there

any evidence to date known to the writer that there is a high risk of encountering currently unrecorded archaeology within the proposed building footprints. However, there is an unquantified 'moderate' risk that archaeological features or materials associated either with V21/299 or unrelated activities occurring at the river mouth could be encountered during the work. Any such encounter, without an approved Archaeological Authority in place, could result in significant delays to the project whilst an Authority is sought and the required investigations carried out.

RECOMMENDATIONS

The pump station demolition and replacement could be undertaken under Accidental Discovery Protocol (ADP).

Hawke's Bay RC are encouraged to consider the risks associated with an ADP approach in terms of project delays should currently unrecorded archaeology be encountered. If an Archaeological Authority were required mid-project this could result in delays in the order of 4 - 6 months for document preparation, iwi consultation and HNZPT processing times. Alternatively, a pre-emptive Archaeological Authority could be applied for, potentially incurring costs and time delays (pre-start) that later prove to be unnecessary.

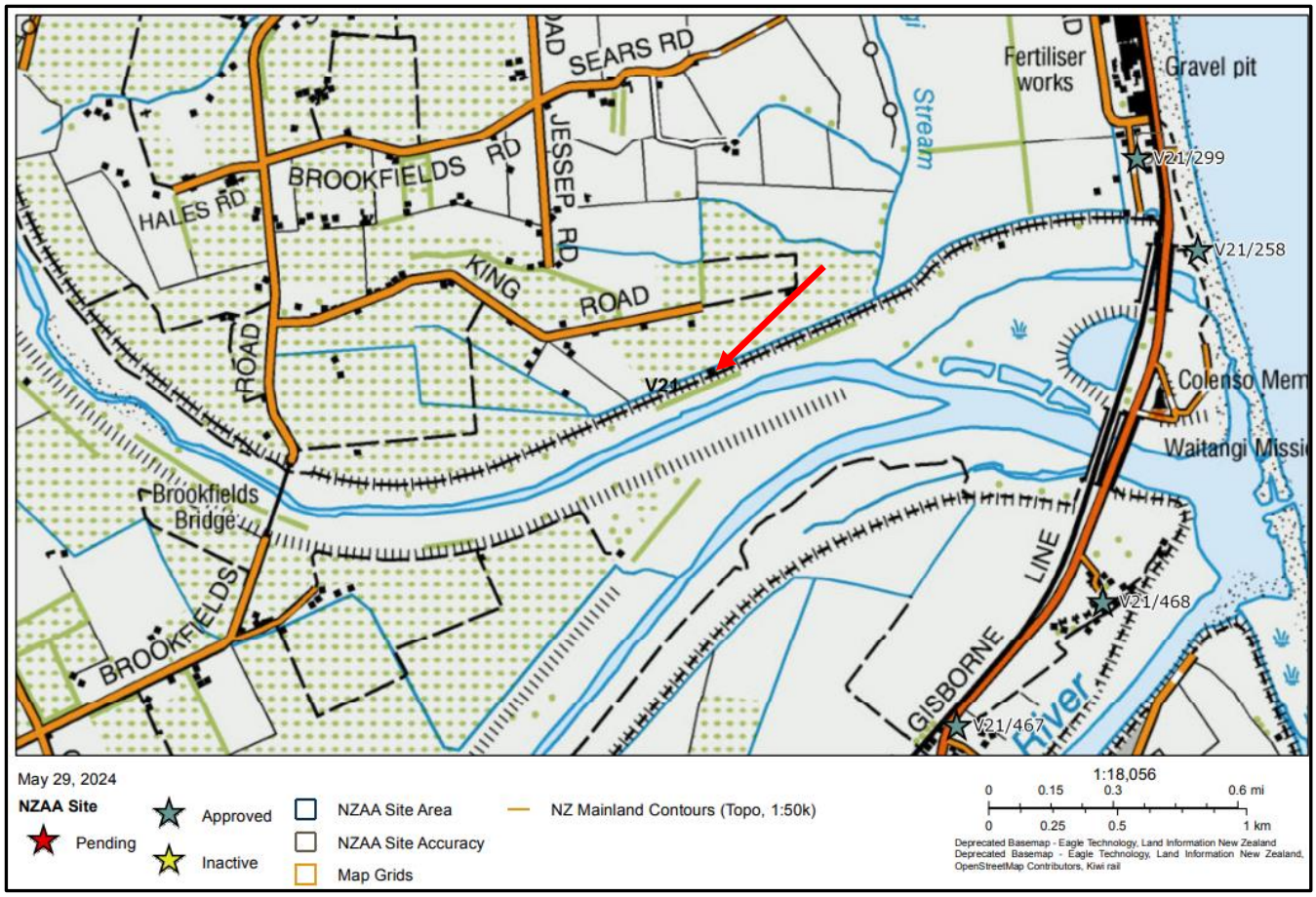
BROOKFIELDS PUMP STATION

Brookfields pump station is located adjacent to the Tutaekuri River corridor. The area is primarily used for horticulture, viticulture and orchards. The redirected Tutaekuri runs to the south, whilst the redirected Ngaruroro joins the Tutaekuri channel to the east (see below).

Brookfields Pump Station location in local context, arrowed red shade indicated project area (Google Earth Pro & kmz data provided by J.P. Neethling).

ARCHSITE

There are currently no recorded archaeological sites within 1 km of the proposed replacement Brookfields pump station. The nearest recorded sites lie > 1.5 km east and include V21/258 and V21/299.



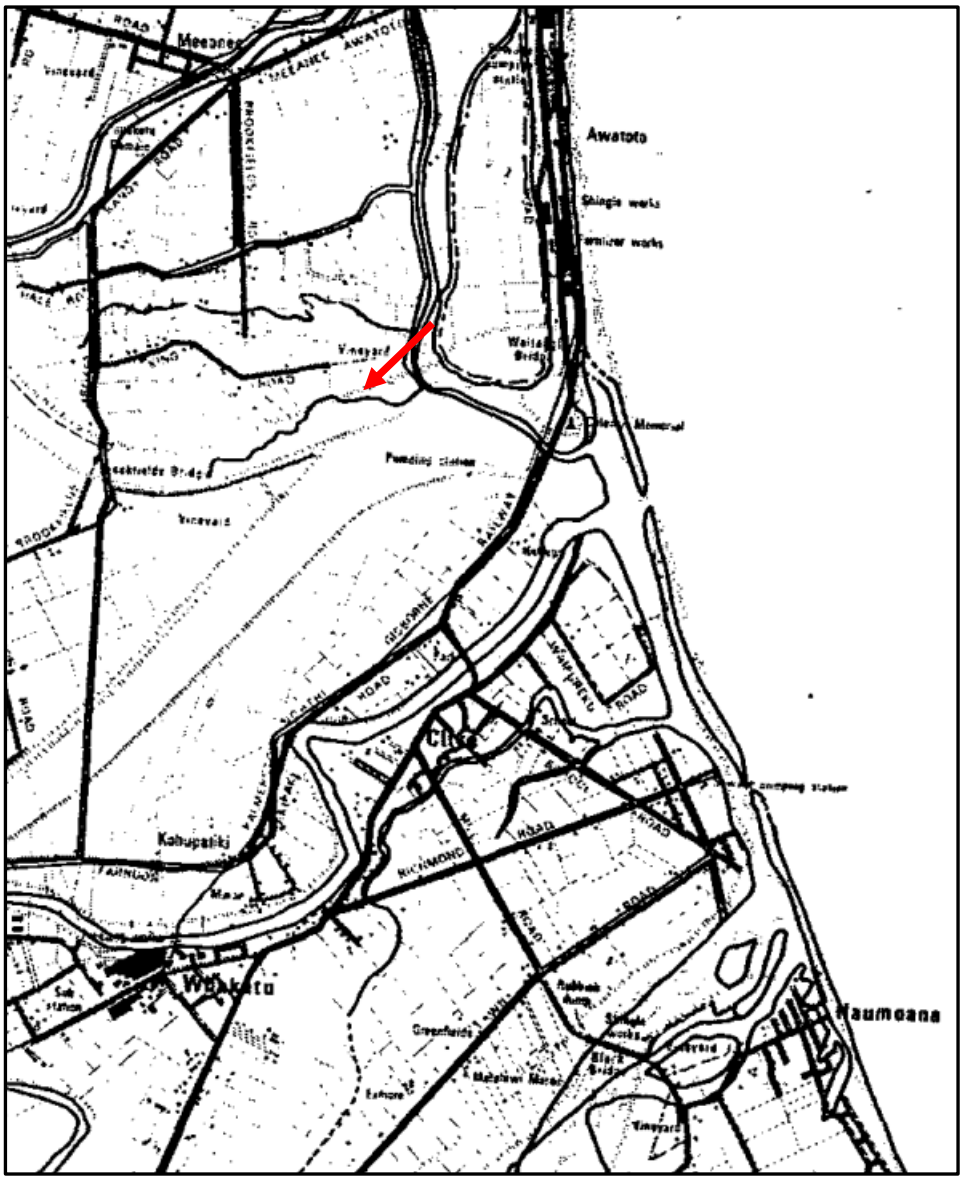
Archsite excerpt showing the recorded archaeological sites in the immediate vicinity of the pump station location (arrowed).

HISTORIC MAPS

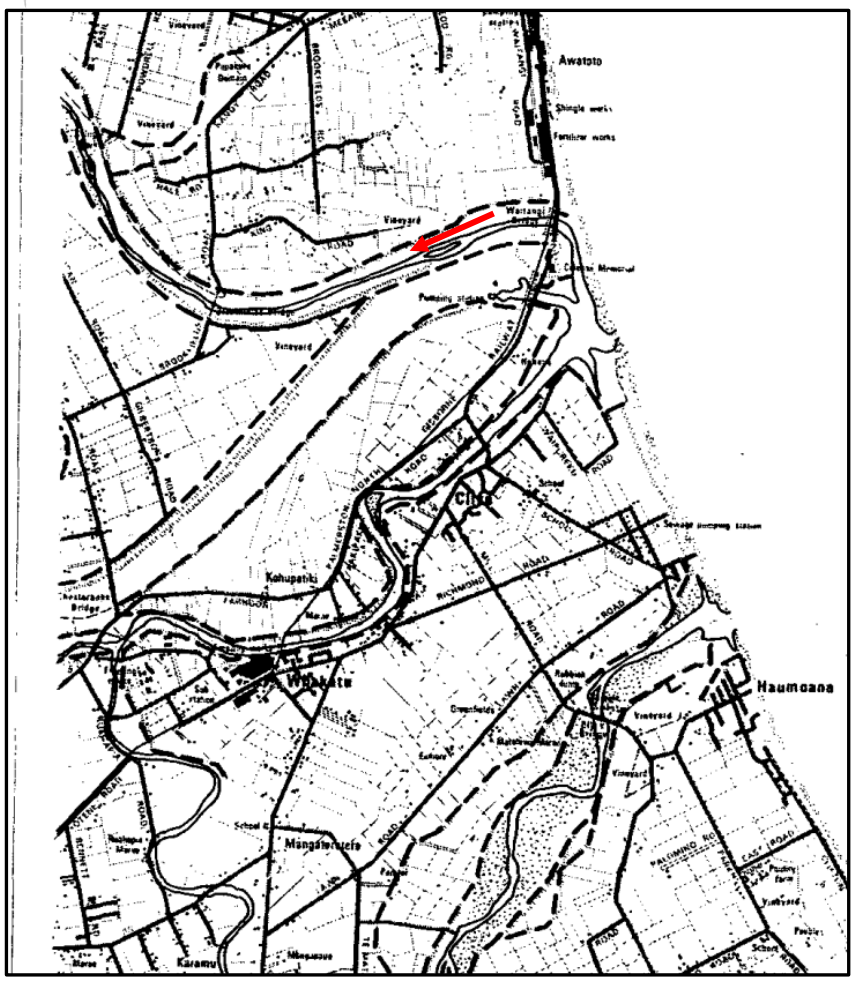
Historic maps are very useful for understanding past landscapes, especially in areas such as this where river courses have been significantly modified both by natural and engineered means. A series of Hawke's Bay Rivers Board map excerpts included in the V21/299 Site Record form shows the changes to the river mouth and river corridors between 1875 and 1990. In 1875 the Brookfield pump station location is near a small stream. This environment of meandering streams and wetlands was potentially high in resource value and therefore archaeological risk.

By 1958 the Tutaekuri had been diverted to its current path and the proposed Ngaruroro diversion had been seemingly confirmed. The Brookfield pump station location is now

adjacent to the newly formed Tutaekuri river channel. It is assumed that the creation of the new river channel would have involved extensive invasive earthwork that would have destroyed any archaeological features or horizons in this area.



Hawke's Bay Rivers Board plan excerpt showing 1875 rivers and coastal environment in the Awatoto to Haumoana area, project area arrowed.



Hawke's Bay Rivers Board plan excerpt showing 1958 rivers and coastal environment in the Awatoto to Haumoana area, project area arrowed.

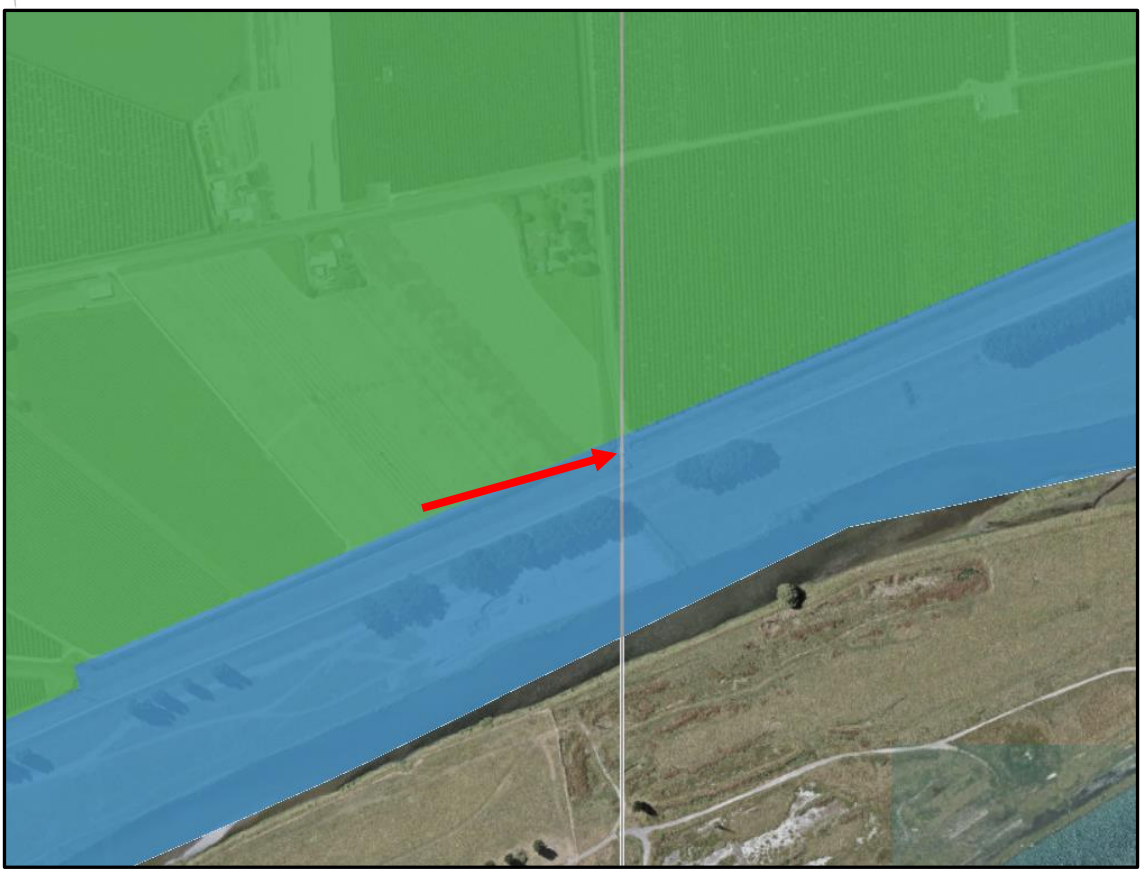
HISTORIC AERIAL IMAGES

Several Retrolens historic aerial images dating from the 1930s to 1990s were scanned for information relating to the recent history of modifications to the pump station location and for potential unrecorded archaeological sites that might be affected by the proposed work. Although there are several images that cover the area, none showed anything of archaeological interest.

DISTRICT PLANS

The area of proposed work lies within the Napier City Council region and is zoned as River Conservation. There are no items of cultural or historical significance identified in the immediate area on the Operative District Plan[2].

[2] https://napier.isoplan.co.nz/eplan/property/0/0/42



Indicative location of proposed work (arrowed) in relation to NCC District Plan.

DISCUSSION

The proposed replacement pump station has no recorded archaeological sites within 1 km, the nearest recorded sites being > 1.5 km distant. Prior to the mid-20th C the Brookfields pump station location sat adjacent to a small stream and potentially within an environment of high archaeological resources. However, with the realignment of the Tutaekuri River through this area any archaeology, even that buried at depth, would likely have been destroyed.

SUMMARY STATEMENT

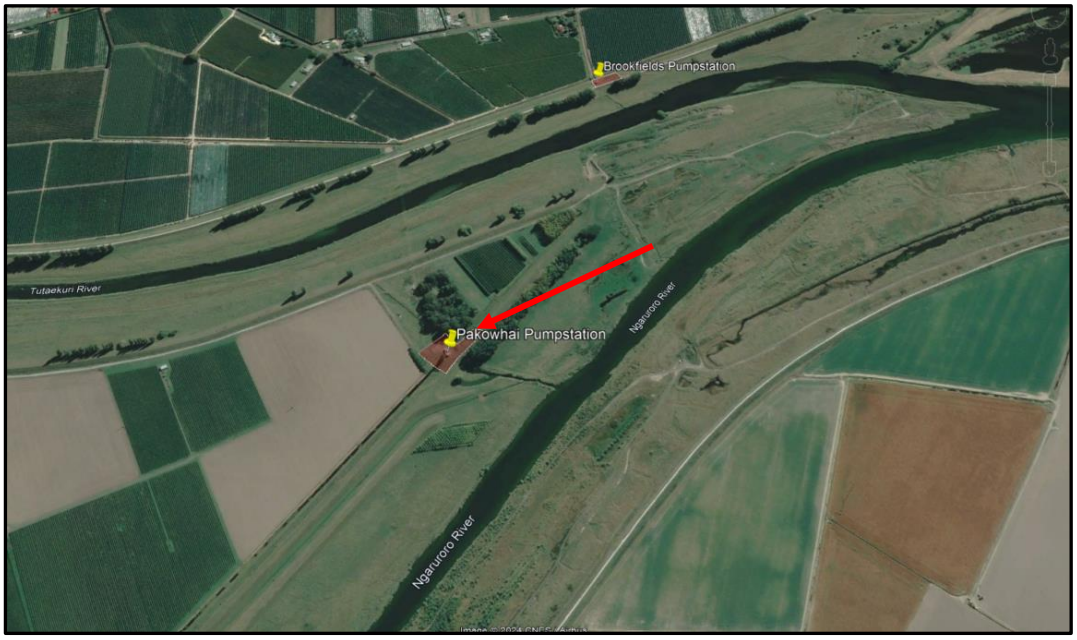
The proposed work does not directly impact any currently recorded archaeology. The realignment of the Tutaekuri River at this location would likely have destroyed any archaeology encountered. Therefore, although the wider landscape carries an unquantified risk of flood buried archaeological horizons being encountered, the 20th C modifications in this location reduce the archaeological risk to low or very low.

RECOMMENDATIONS

The pump station demolition and replacement could be undertaken under Accidental Discovery Protocol (ADP).

PAKOWHAI PUMP STATION

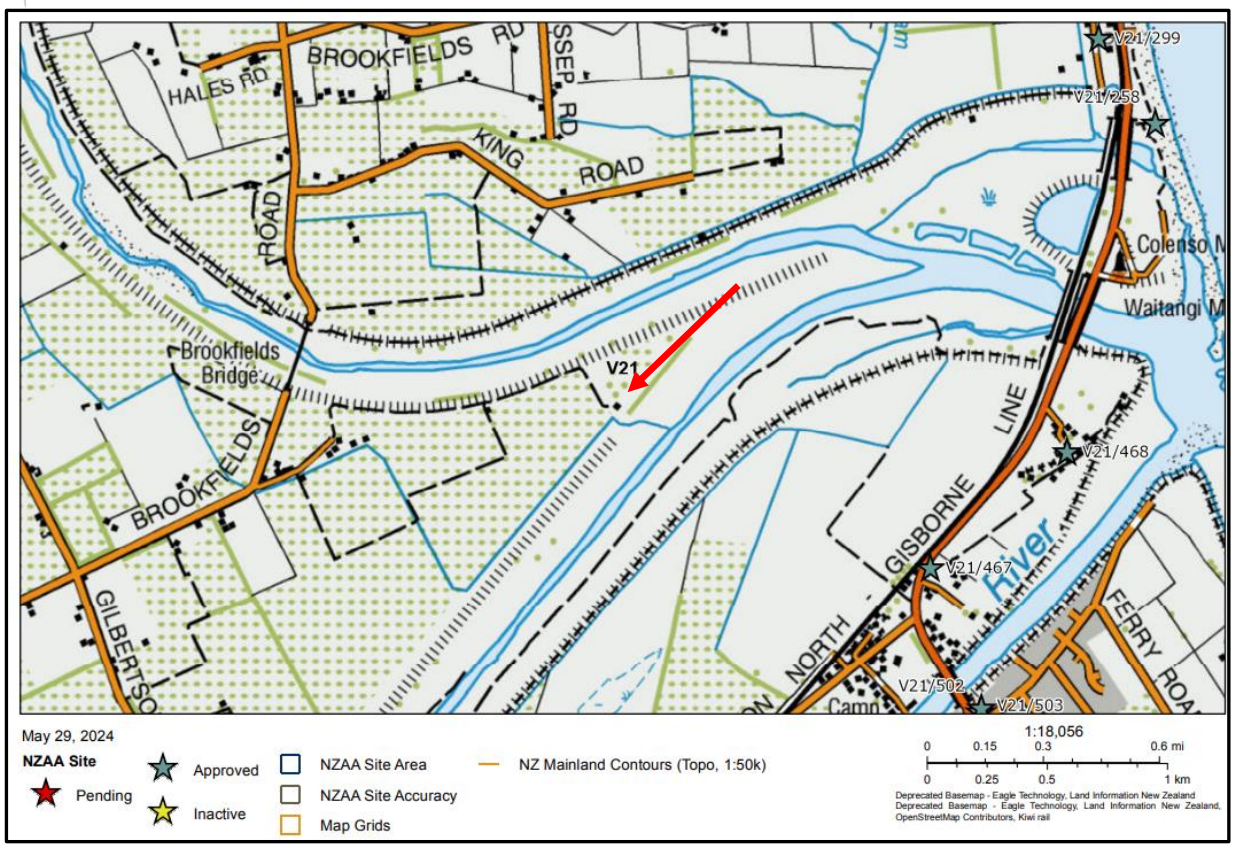
Pakowhai pump station is located between the present day Tutaekuri and Ngaruroro River corridor. The area is primarily used for horticulture, viticulture and orchards. The redirected Tutaekuri runs to the north, whilst the redirected Ngaruroro joins the Tutaekuri channel to the east (see below).



Pakowhai Pump Station location in local context, arrowed red shade indicated project area (Google Earth Pro & kmz data provided by J.P. Neethling).

ARCHSITE

There are currently no recorded archaeological site within 1 km of the proposed replacement Pakowhai pump station. The nearest recorded sites lie > 1.5 km south east and include V21/467 and V21/503.

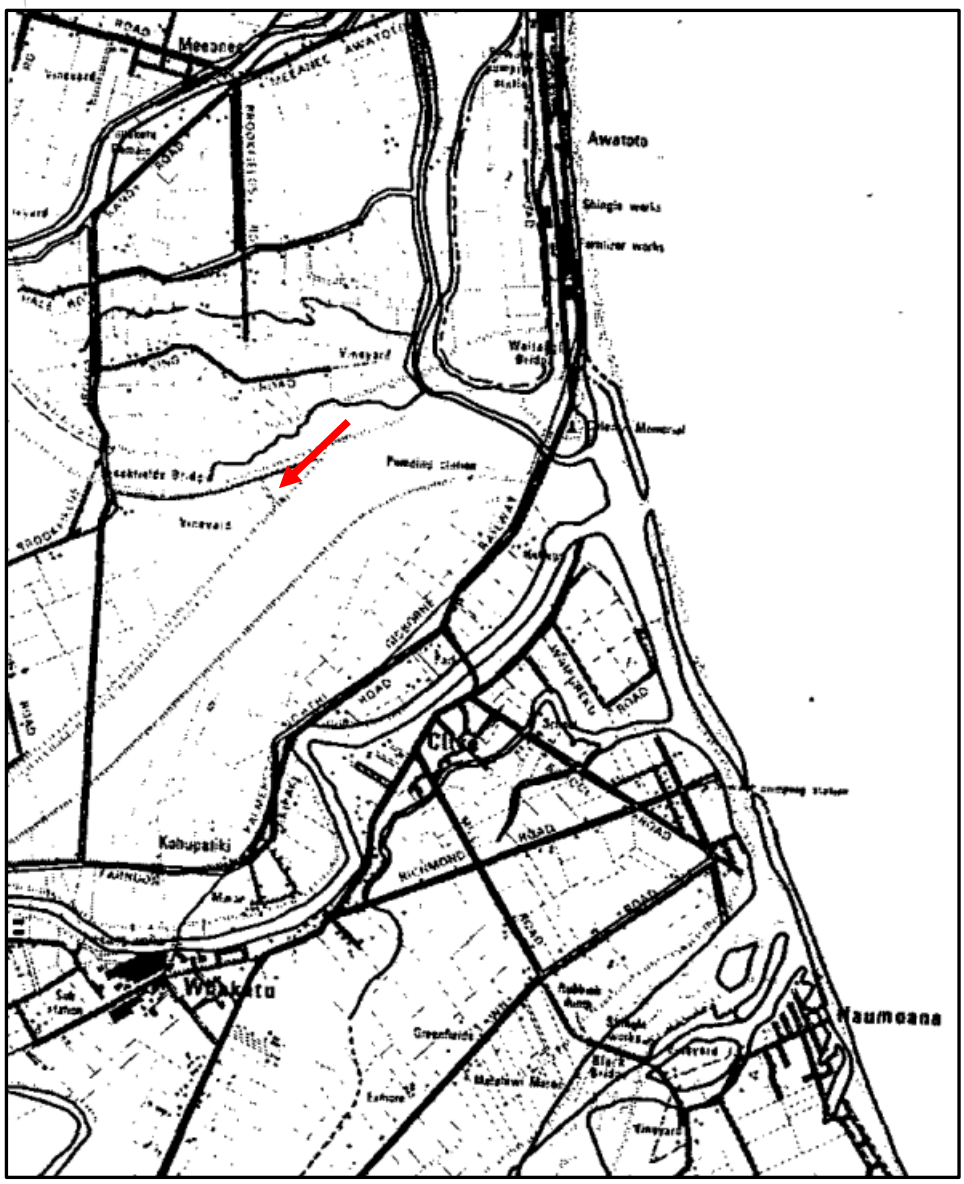


Archsite excerpt showing the recorded archaeological sites in the immediate vicinity of the pump station location (arrowed).

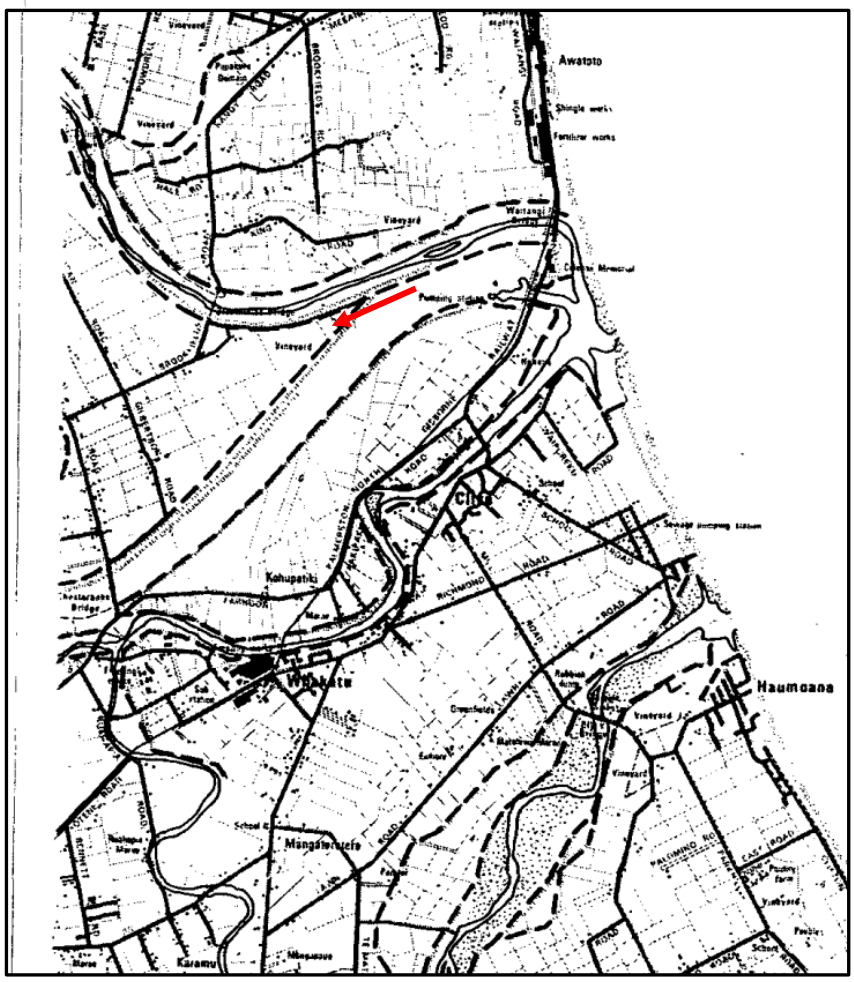
HISTORIC MAPS

Historic maps are very useful for understanding past landscapes, especially in areas such as this where river courses have been significantly modified both by natural and engineered means. A series of Hawke's Bay Rivers Board map excerpts included in the V21/299 Site Record form shows the changes to the river mouth and river corridors between 1875 and 1990. In 1875 the Pakowhai pump station location is near a small stream. This environment of meandering streams and wetlands was potentially high in resource value and therefore archaeological risk.

By 1958 the Tutaekuri had been diverted to its current path and the proposed Ngaruroro diversion had been seemingly confirmed. The Pakowhai pump station location is now between the newly formed Tutaekuri and proposed (later constructed) Ngaruroro river channels. It is assumed that the creation of the new river channels would have involved extensive invasive earthwork that would have destroyed any archaeological features or horizons in this area.



Hawke's Bay Rivers Board plan excerpt showing 1875 rivers and coastal environment in the Awatoto to Haumoana area, project area arrowed.



Hawke's Bay Rivers Board plan excerpt showing 1958 rivers and coastal environment in the Awatoto to Haumoana area, project area arrowed.

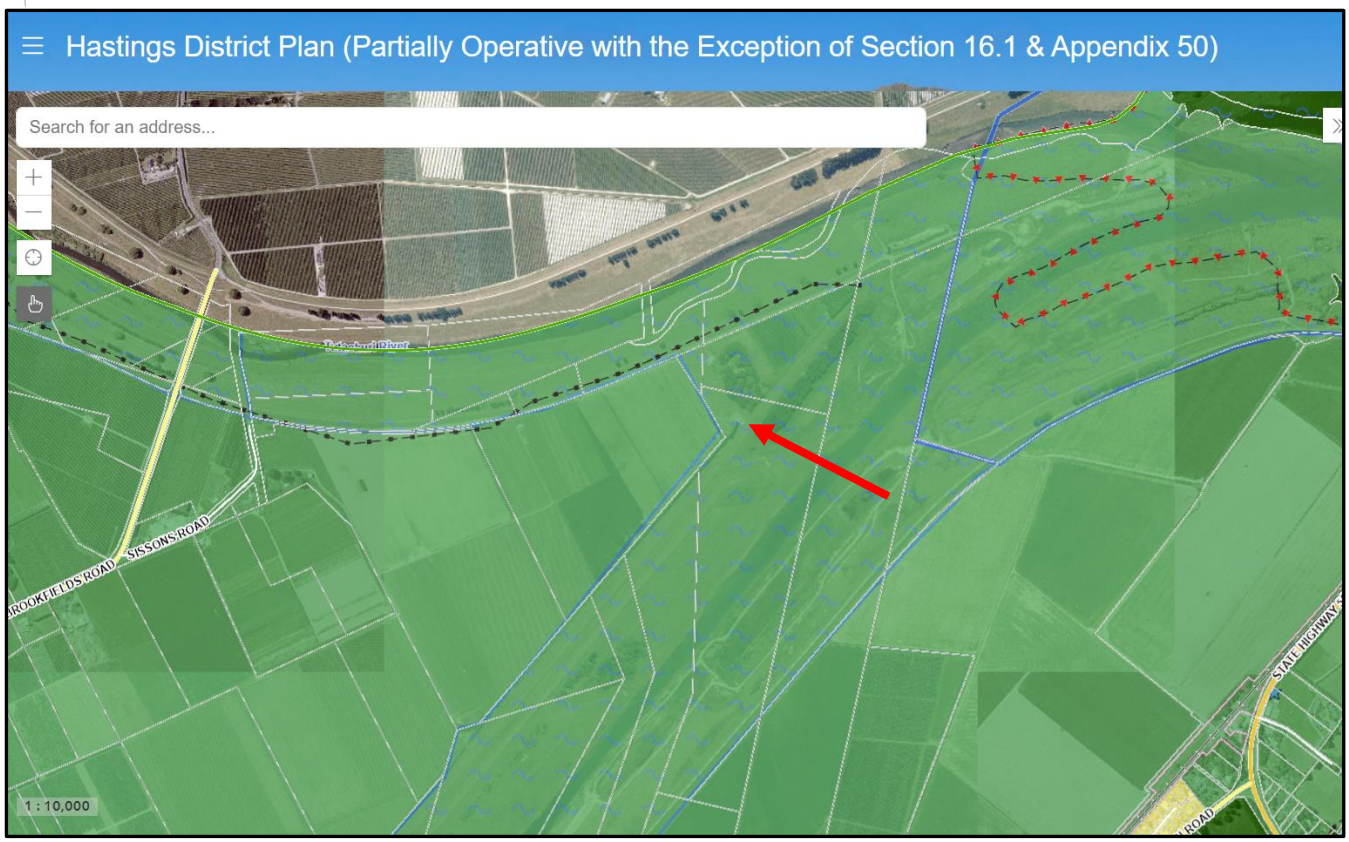
HISTORIC AERIAL IMAGES

Several Retrolens historic aerial images dating from the 1930s to 1990s were scanned for information relating to the recent history of modifications to the pump station location and for potential unrecorded archaeological sites that might be affected by the proposed work. Although there are a number of images that cover the area, none showed anything of archaeological interest.

DISTRICT PLANS

The area of proposed work lies within the Hastings District Council region and is zoned as Rural and River Hazard. There are no items of cultural or historical significance identified in the immediate area on the Operative District Plan[3].

[3] https://eplan.hdc.govt.nz/eplan/property/2051389/1772783/5702598/5557738/0/1213



Indicative location of proposed work (arrowed) in relation to HDC District Plan.

DISCUSSION

The proposed replacement pump station has no recorded archaeological sites within 1 km, the nearest recorded sites being circa 1.5 km distant. Prior to the mid-20th C the Pakowhai pump station location sat near a small stream and potentially within an environment of high archaeological resources. However, with the realignment of the Tutaekuri and Ngaruroro Rivers through this area any archaeology, even that buried at depth, would likely have been destroyed.

SUMMARY STATEMENT

The proposed work does not directly impact any currently recorded archaeology. The realignment of the Tutaekuri and Ngaruroro Rivers at this location would likely have destroyed any archaeology encountered. Therefore, although the wider landscape carries an unquantified risk of flood buried archaeological horizons being encountered, the 20th C modifications in this location reduce the archaeological risk to low or very low.

RECOMMENDATIONS

The pump station demolition and replacement could be undertaken under Accidental Discovery Protocol (ADP).

RECOMMENDATIONS SUMMARY

Pump Station	**Recommendation**	**Further Action**
Awatoto	ADP / Precautionary Authority	HBRC consider the risks to the project if unrecorded archaeology is encountered vs potentially unnecessary costs of applying for and complying with a precautionary Authority.
Brookfields	ADP	None Required
Pakowhai	ADP	None Required

DISCLAIMER

It should be noted that even where the archaeological risk posed by this project is ultimately determined as low, this does not guarantee that archaeological features or materials will not be encountered.

Any such features or materials encountered are protected under the HNZPTA 2014 and if encountered are required to be reported and dealt with appropriately. This could result in significant delays to the work program. Therefore, HBRC are recommended to consider the completing an Archaeological Authority application process prior to works commencing as a risk management measure.

It is recommended that the individual potential Applicants / Authority Holders are briefed on this process PRIOR to commissioning any Assessment of Effects and Authority Application.

An Archaeology Hawke's Bay Ltd information sheet can be provided at the appropriate juncture, or alternatively the HNZPT website can be consulted for further information: http://www.heritage.org.nz/.

Borehole No. 01-AW

Project:	HBRC Pumpstation(s) Development	*Coordinates:*	1936948 E 5613848 N
Client:	Hawke's Bay Regional Council	*Ref. Grid:*	NZTM
Project No.:	2-S5717	*R.L.:*	1.5 m
Location:	Awatoto Pumpstation	*Datum:*	NZ Vertical Datum 2016

Depth: 15.45 m
Inclination: Vertical

GEOLOGY	MAIN DESCRIPTION / DETAIL DESCRIPTION	R.L. (m)	DEPTH (m)	GRAPHIC LOG	TESTS: SPT 'N' VALUE	TESTS: SPT BLOW COUNTS OR SHEAR VALUE	CORE: CORE TYPE	CORE: TOTAL CORE RECOVERY (%)	DRILLING: DRILLING METHOD	DRILLING: CASING	DRILLING: BASE OF HOLE & WATER LEVEL	NOTES / OTHER TESTS	INSTALLATION DETAILS
Fill	Sandy medium to coarse GRAVEL, dark grey. Tightly packed; wet; poorly graded; gravel, sub-angular to sub-rounded, sandstone; sand, medium to coarse.	0	1				VE	0	Sonic core drilling		SWL 0.90m 2/07	0.00-1.50m - hydro-excavated, some soil disturbance to base of hole expected prior to SPT at 1.5m.	Bentonite backfill
					10	4// 2/4/2/2	SPT	100				0.90m - standing water level measured morning after completing drilling.	
			2				Sonic	75					
Heretaunga Formation Alluvium	Fine SAND; greyish brown. Loosely packed; wet; uniformly graded.												
	SILT, with minor clay and sand; grey. Soft; wet; low plasticity; sand, fine.						Sonic	100			SWL 2.70m 1/07		
			3		4	0// 1/1/1/1	SPT	100				Lab: 2.6-2.8m - PSD (with hydrometer); Atterberg Limit Set. 2.70m - standing water level measured immediately after borehole completion.	
	3.50m - clay appears absent; low plasticity.	-2											
	Silty fine SAND, with trace clay; grey. Loose; wet; well graded.		4				Sonic	100					
	4.50m - silt, some.				5	1// 1/2/1/1	SPT	100					
			5									Lab: 5.0-5.2m - PSD (with hydrometer); Atterberg Limit Set.	
	5.25m - silty. 5.40m - silt, some. 5.60m - silty.	-4					Sonic	100					
	5.95m - silt, minor. 6.00m - becomes medium dense.		6		14	3// 3/3/4/4	SPT	100					
	6.50-6.60m - with trace shells, white, fractured.												
	Sandy SILT, with trace organics; brownish grey. Soft to firm; wet; low plasticity; sand, fine; organics, wood/plant speckled remains, fibrous, highly decomposed.		7				Sonic	100					
	Fine SAND, with minor silt; grey. Loosely packed; wet; uniformly graded.	-6											
	Sandy SILT; grey. Stiff; wet; non-plastic; sand, fine.				21	6// 5/5/6/5	SPT	100					
	8.00-8.05m - with organic inclusions, wood fragments, fibrous, moderately fresh.		8										
	Fine SAND, with trace shells; grey. Loose; wet; uniformly graded.						Sonic	100					
			9		6	2// 2/1/1/2	SPT	25					
		-8											
	SILT, with some sand and clay; greyish brown. Soft; wet to saturated; low plasticity; sand, fine.						Sonic	100					
	Shelly fine to medium SAND; grey. Very loose.												

Notes:

SPT Hammer No. 322914-34. SPT hammer energy ratio 96%
Hand-held shear vane measurements attempted in cohesive soils - no reliable data able to be retreived (core breakage when applying vane tests).

Started:	1/07/2024	*Finished:*	1/07/2024
Drilling Co.:	Geotech Drilling	*Drilling Rig:*	Sonicsampdrill CRS-T
Logged by:	R. Loomes	*Checked by:*	S. Hill

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.

Scale 1:50 @ A4

Borehole No. 01-AW

Project:	HBRC Pumpstation(s) Development	*Coordinates:*	1936948 E 5613848 N
Client:	Hawke's Bay Regional Council	*Ref. Grid:*	NZTM
Project No.:	2-S5717	*R.L.:*	1.5 m
Location:	Awatoto Pumpstation	*Datum:*	NZ Vertical Datum 2016

Depth: 15.45 m
Inclination: Vertical

GEOLOGY	MAIN DESCRIPTION / DETAIL DESCRIPTION	R.L. (m)	DEPTH (m)	GRAPHIC LOG	TESTS: SPT 'N' VALUE	TESTS: SPT BLOW COUNTS OR SHEAR VALUE	CORE: CORE TYPE	CORE: TOTAL CORE RECOVERY (%)	DRILLING: DRILLING METHOD	DRILLING: CASING	DRILLING: BASE OF HOLE & WATER LEVEL	NOTES / OTHER TESTS	INSTALLATION DETAILS
Heretaunga Formation Alluvium	Shelly fine to medium SAND; grey. Very loose.*(continued)* 10.30m - shells become absent.						Sonic	100	Sonic core drilling				Bentonite backfill
					1	2// 0/0/0/1	SPT	100					
	Sandy SILT, with minor clay; grey. Very soft; wet to saturated; low plasticity; sand, fine.	11					Sonic	100					
		-10											
	Fine SAND; grey. Medium dense to dense; wet; uniformly graded.	12			29	2// 5/9/7/8	SPT	100					
	SILT, with some clay; grey. Soft to firm; wet; low plasticity. 13.40m - clay appears absent.	13					Sonic	100					
		-12			8	2// 1/2/2/3	SPT	100					
	14.00-14.10m - with some shells.	14					Sonic	100					
	Sandy SILT; grey. Soft; wet; low plasticity.	15			8	4// 2/2/2/2	SPT	100					
	END OF BOREHOLE AT 15.45m - Target Depth Reached	-14											
		16											
		17											
		-16											
		18											
		19											
		-18											

Notes:
SPT Hammer No. 322914-34. SPT hammer energy ratio 96%
Hand-held shear vane measurements attempted in cohesive soils - no reliable data able to be retreived (core breakage when applying vane tests).

Started: 1/07/2024
Finished: 1/07/2024
Drilling Co.: Geotech Drilling
Drilling Rig: Sonicsampdrill CRS-T
Logged by: R. Loomes
Checked by: S. Hill

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.
Scale 1:50 @ A4

Borehole No. 01-AW

Project:	HBRC Pumpstation(s) Development	*Coordinates:*	1936948 E 5613848 N		
Client:	Hawke's Bay Regional Council	*Ref. Grid:*	NZTM	*Depth:*	15.45 m
Project No.:	2-S5717	*R.L.:*	1.5 m	*Inclination:*	Vertical
Location:	Awatoto Pumpstation	*Datum:*	NZ Vertical Datum 2016		

PHOTOGRAPHS

Photo 01-AW.1
0.0 - 4.95m

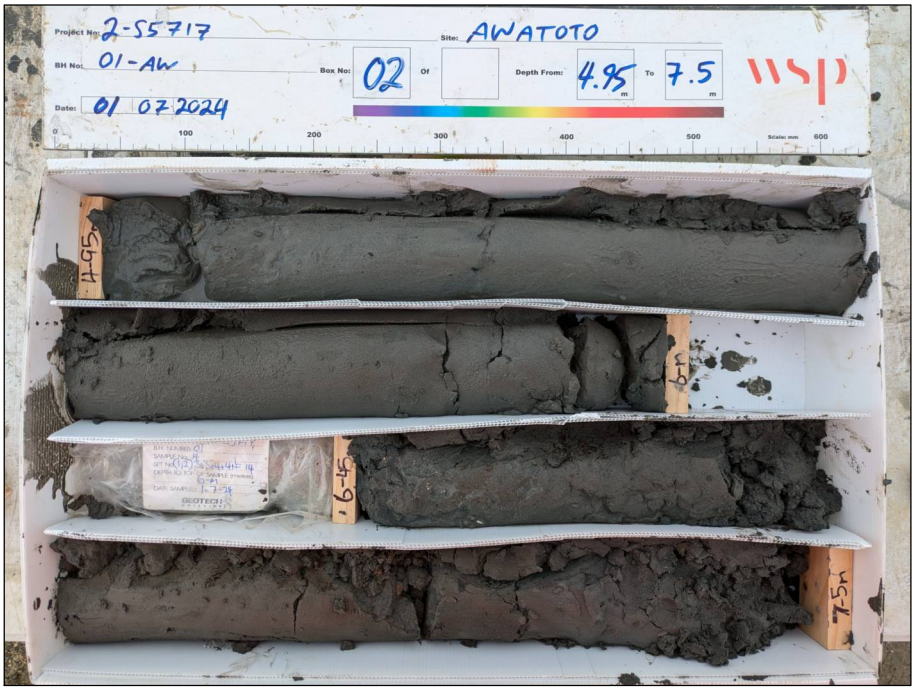


Photo 01-AW.2
4.95 - 7.5m

Notes:
SPT Hammer No. 322914-34. SPT hammer energy ratio 96%
Hand-held shear vane measurements attempted in cohesive soils - no reliable data able to be retreived (core breakage when applying vane tests).

Started:	1/07/2024	*Finished:*	1/07/2024
Drilling Co.:	Geotech Drilling	*Drilling Rig:*	Sonicsampdrill CRS-T
Logged by:	R. Loomes	*Checked by:*	S. Hill

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.

Scale 1:50 @ A4

Borehole No. 01-AW

Project:	HBRC Pumpstation(s) Development	*Coordinates:*	1936948 E 5613848 N
Client:	Hawke's Bay Regional Council	*Ref. Grid:*	NZTM
Project No.:	2-S5717	*R.L.:*	1.5 m
Location:	Awatoto Pumpstation	*Datum:*	NZ Vertical Datum 2016

Depth: 15.45 m
Inclination: Vertical

PHOTOGRAPHS

Photo 01-AW.3
7.5 - 10.1m

Photo 01-AW.4
10.1 - 12.8m

Notes:
SPT Hammer No. 322914-34. SPT hammer energy ratio 96%
Hand-held shear vane measurements attempted in cohesive soils - no reliable data able to be retreived (core breakage when applying vane tests).

Started:	1/07/2024	*Finished:*	1/07/2024
Drilling Co.:	Geotech Drilling	*Drilling Rig:*	Sonicsampdrill CRS-T
Logged by:	R. Loomes	*Checked by:*	S. Hill

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.
Scale 1:50 @ A4

Borehole No. 01-AW

Project:	HBRC Pumpstation(s) Development	*Coordinates:*	1936948 E 5613848 N
Client:	Hawke's Bay Regional Council	*Ref. Grid:*	NZTM
Project No.:	2-S5717	*R.L.:*	1.5 m
Location:	Awatoto Pumpstation	*Datum:*	NZ Vertical Datum 2016

Depth: 15.45 m
Inclination: Vertical

PHOTOGRAPHS

Photo 01-AW.5
12.8 - 15.45m

Notes:
SPT Hammer No. 322914-34. SPT hammer energy ratio 96%
Hand-held shear vane measurements attempted in cohesive soils - no reliable data able to be retreived (core breakage when applying vane tests).

Started:	1/07/2024	*Finished:*	1/07/2024
Drilling Co.:	Geotech Drilling	*Drilling Rig:*	Sonicsampdrill CRS-T
Logged by:	R. Loomes	*Checked by:*	S. Hill

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.
Scale 1:50 @ A4

Borehole No. 01-BR

Project:	HBRC Pumpstation(s) Development	*Coordinates:*	1936948 E 5613246 N
Client:	Hawke's Bay Regional Council	*Ref. Grid:*	NZTM
Project No.:	2-S5717	*R.L.:*	1.5 m
Location:	Brooksfield Pumpstation	*Datum:*	NZ Vertical Datum 2016

Depth: 15.45 m
Inclination: Vertical

GEOLOGY	MAIN DESCRIPTION / DETAIL DESCRIPTION	R.L. (m)	DEPTH (m)	GRAPHIC LOG	TESTS: SPT 'N' VALUE	TESTS: SPT BLOW COUNTS OR SHEAR VALUE	CORE: CORE TYPE	CORE: TOTAL CORE RECOVERY (%)	DRILLING: DRILLING METHOD	DRILLING: CASING	DRILLING: BASE OF HOLE & WATER LEVEL	NOTES / OTHER TESTS	INSTALLATION DETAILS
Fill	Sandy fine to coarse GRAVEL, with minor silt; light brownish grey. Tightly packed; moist; well graded; sand, fine.		1								SWL 0.70m 2/07		
	0.75m - becomes dry.	0					Sonic	50			SWL 1.00m 3/07	0.70m - standing water level measured immediately after borehole completion. 1.00m - standing water level measured morning after completing drilling.	
Heretaunga Formation Alluvium	SILT, with trace organics; grey. Very soft; wet; low plasticity; organics, woody, fibrous inclusions, moderately fresh.		2		0	1// 0/0/0/0	SPT	100					
							Sonic	100					
	SILT, with some clay and trace sand; with some silt; grey. Very soft; wet; low plasticity; sand, fine.		3		0	0// 0/0/0/0	SPT	100				SPT: sinking under hammer weight.	
	3.50m - becomes firm, with trace organics, fibrous, wood inclusions, moderately fresh.	-2					Sonic	100				Lab: 3.45-3.65m - PSD (with hydrometer); Atterberg Limit Set.	
	SILT, with minor clay and trace organics; grey. Very soft; wet; low plasticity; organics, amorphous.		4		0	0// 0/0/0/0	SPT	100				SPT: sinking under hammer weight.	
	Organic SILT; grey with dark brown flecks. Firm; moist; low plasticity; organics, fibrous, slightly spongey, plant matter, highly decomposed. 5.35m - organics become mostly amorphous, completely decomposed.	-4	5				Sonic	100	Sonic core drilling				Bentonite backfill
	SILT, with minor fine sand; grey. Soft; moist to wet; low plasticity.		6		0	0// 0/0/0/0	SPT	100				SPT: sinking under hammer weight.	
	6.00m - sand, some.												
	Sandy SILT; grey. Soft; wet; low plasticity; sand, fine.		7				Sonic	100					
	Fine SAND, with minor silt and trace clay; grey. Loose to medium dense; wet; uniformly graded.	-6			14	3// 2/3/3/6	SPT	75					
	8.20m - sand, fine to medium; with trace shells.		8				Sonic	100					
	8.80m - sand, fine.												
	9.00m - becomes loose to very loose.		9		4	2// 1/0/1/2	SPT	100				Lab: 8.9-9.3m - PSD (with hydrometer); Atterberg Limit Set.	
	9.50-9.55m - thin SILT lense; grey; wet.	-8					Sonic	100					

Notes:
SPT Hammer No. 322914-34. SPT hammer energy ratio 96%
Hand-held shear vane measurements attempted in cohesive soils - no reliable data able to be retreived (core breakage when applying vane tests).

Started:	2/07/2024	*Finished:*	2/07/2024
Drilling Co.:	Geotech Drilling	*Drilling Rig:*	Sonicsampdrill CRS-T
Logged by:	R. Loomes	*Checked by:*	S. Hill

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.

Scale 1:50 @ A4

Borehole No. 01-BR

Project:	HBRC Pumpstation(s) Development	*Coordinates:*	1936948 E 5613246 N
Client:	Hawke's Bay Regional Council	*Ref. Grid:*	NZTM
Project No.:	2-S5717	*R.L.:*	1.5 m
Location:	Brooksfield Pumpstation	*Datum:*	NZ Vertical Datum 2016

Depth: 15.45 m
Inclination: Vertical

GEOLOGY	MAIN DESCRIPTION / DETAIL DESCRIPTION	R.L. (m)	DEPTH (m)	GRAPHIC LOG	TESTS: SPT 'N' VALUE	TESTS: SPT BLOW COUNTS OR SHEAR VALUE	CORE: CORE TYPE	CORE: TOTAL CORE RECOVERY (%)	DRILLING: DRILLING METHOD	DRILLING: CASING	DRILLING: BASE OF HOLE & WATER LEVEL	NOTES / OTHER TESTS	INSTALLATION DETAILS
Heretaunga Formation Alluvium	9.90-9.95m - thin SILT lense; grey; wet. Fine SAND, with minor silt and trace clay; grey. Loose to medium dense; wet; uniformly graded.*(continued)* 10.30-10.33m - thin SILT lense; grey; wet.						Sonic	100	Sonic core drilling				Bentonite backfill
			11		0	2// 0/0/0/0	SPT	100					
	10.90-11.20m - shelly.	-10					Sonic	100					
			12		6	4// 1/1/2/2	SPT	100					
	Sandy SILT; grey. Very soft; wet; low plasticity.						Sonic	100					
	SILT, with minor clay; grey. Soft; wet; low plasticity.		13										
		-12			23	6// 4/6/6/7	SPT	100					
	Sandy SILT; grey. Very soft; wet; non-plastic; sand, fine.		14				Sonic	100					
	Silty fine SAND; grey. Medium dense; wet; well graded.		15		6	0// 2/2/0/2	SPT	100					
	END OF BOREHOLE AT 15.45m - Target Depth Reached	-14											
			16										
			17										
		-16											
			18										
			19										
		-18											

Notes:
SPT Hammer No. 322914-34. SPT hammer energy ratio 96%
Hand-held shear vane measurements attempted in cohesive soils - no reliable data able to be retreived (core breakage when applying vane tests).

Started:	2/07/2024	*Finished:*	2/07/2024
Drilling Co.:	Geotech Drilling	*Drilling Rig:*	Sonicsampdrill CRS-T
Logged by:	R. Loomes	*Checked by:*	S. Hill

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.
Scale 1:50 @ A4

Borehole No. 01-BR

Project:	HBRC Pumpstation(s) Development	*Coordinates:*	1936948 E 5613246 N		
Client:	Hawke's Bay Regional Council	*Ref. Grid:*	NZTM	*Depth:*	15.45 m
Project No.:	2-S5717	*R.L.:*	1.5 m	*Inclination:*	Vertical
Location:	Brooksfield Pumpstation	*Datum:*	NZ Vertical Datum 2016		

PHOTOGRAPHS

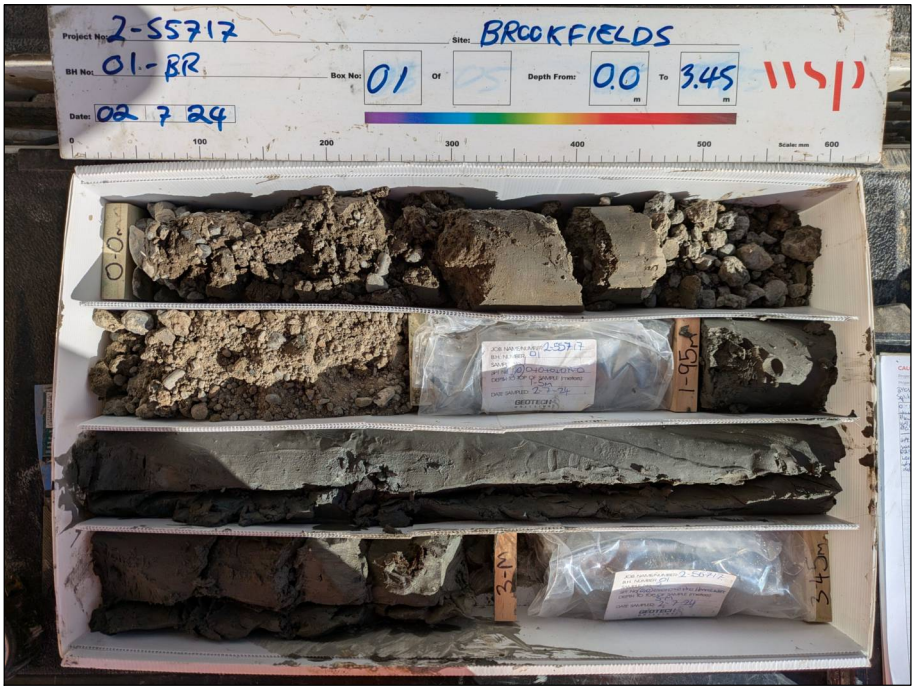


Photo 01-BR.1
0.0 - 3.45m

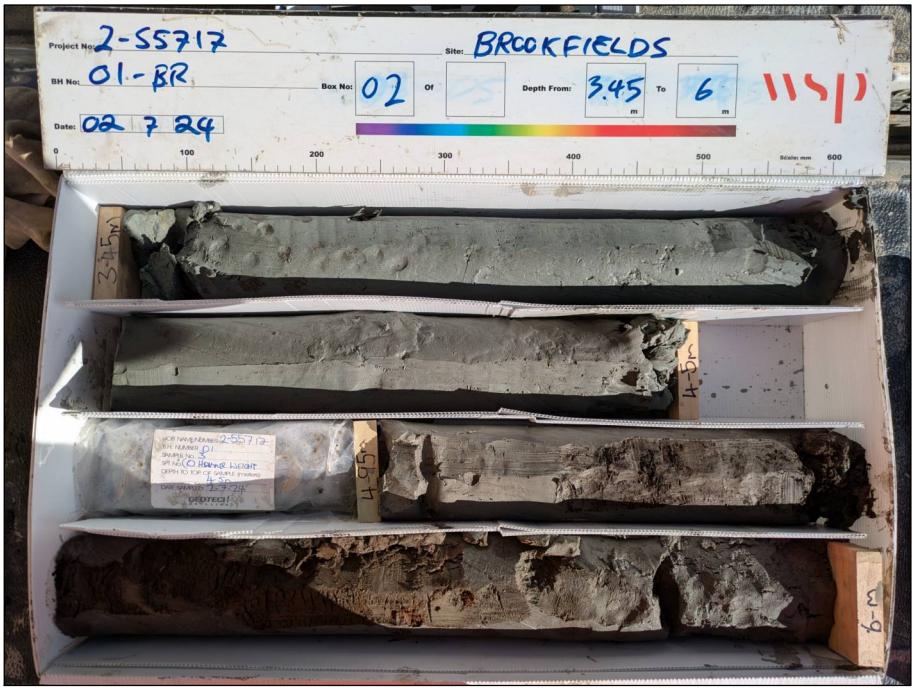


Photo 01-BR.2
3.45 - 6m

BOREHOLE SOIL LOG A4 - WSP HBRC PUMPSTATIONS.GPJ WSP-OPUS2018_TEM.GDT 9/8/24

Notes:
SPT Hammer No. 322914-34. SPT hammer energy ratio 96%
Hand-held shear vane measurements attempted in cohesive soils - no reliable data able to be retreived (core breakage when applying vane tests).

Started:	2/07/2024	*Finished:*	2/07/2024
Drilling Co.:	Geotech Drilling	*Drilling Rig:*	Sonicsampdrill CRS-T
Logged by:	R. Loomes	*Checked by:*	S. Hill

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.
Scale 1:50 @ A4

Borehole No. 01-BR

Project:	HBRC Pumpstation(s) Development	*Coordinates:*	1936948 E 5613246 N		
Client:	Hawke's Bay Regional Council	*Ref. Grid:*	NZTM	*Depth:*	15.45 m
Project No.:	2-S5717	*R.L.:*	1.5 m	*Inclination:*	Vertical
Location:	Brooksfield Pumpstation	*Datum:*	NZ Vertical Datum 2016		

PHOTOGRAPHS

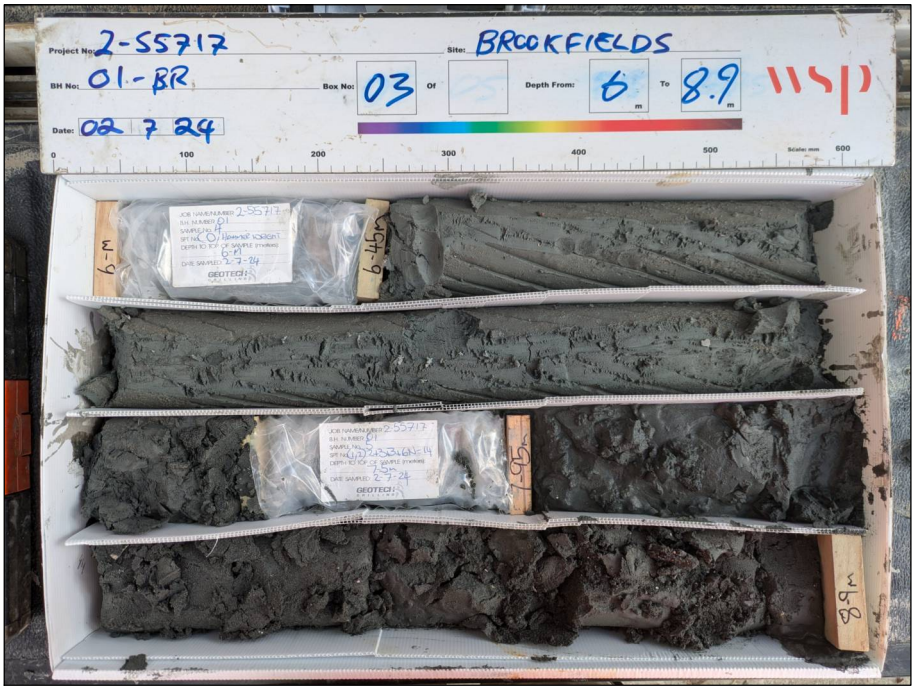


Photo 01-BR.3
6.0 - 8.9m

Photo 01-BR.4
8.9 - 11.5m

Notes:

SPT Hammer No. 322914-34. SPT hammer energy ratio 96%
Hand-held shear vane measurements attempted in cohesive soils - no reliable data able to be retreived (core breakage when applying vane tests).

Started:	2/07/2024	*Finished:*	2/07/2024
Drilling Co.:	Geotech Drilling	*Drilling Rig:*	Sonicsampdrill CRS-T
Logged by:	R. Loomes	*Checked by:*	S. Hill

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.

Scale 1:50 @ A4

Borehole No. 01-BR

Project:	HBRC Pumpstation(s) Development	*Coordinates:*	1936948 E 5613246 N		
Client:	Hawke's Bay Regional Council	*Ref. Grid:*	NZTM	*Depth:*	15.45 m
Project No.:	2-S5717	*R.L.:*	1.5 m	*Inclination:*	Vertical
Location:	Brooksfield Pumpstation	*Datum:*	NZ Vertical Datum 2016		

PHOTOGRAPHS

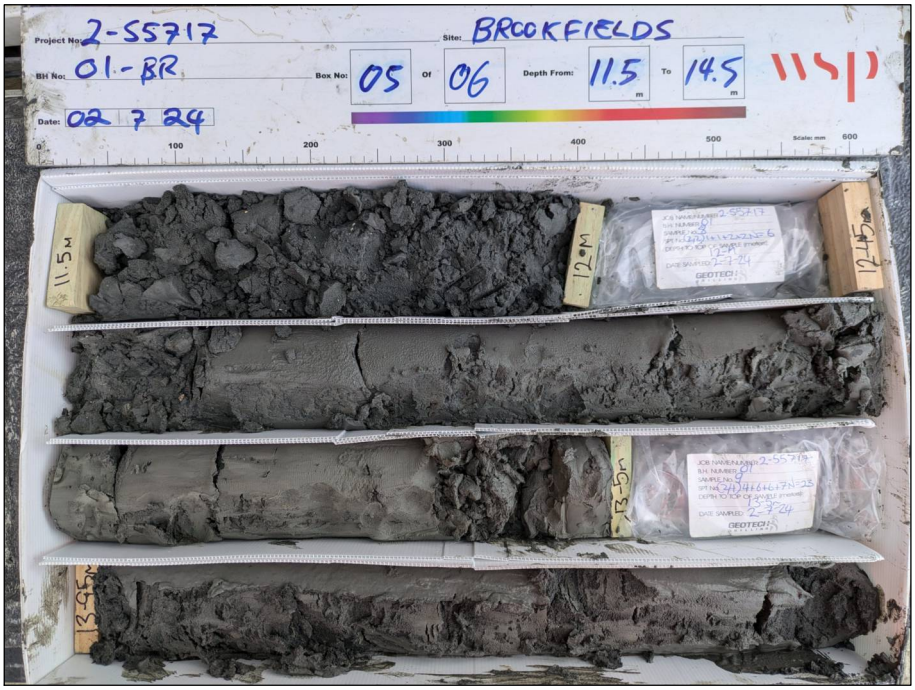


Photo 01-BR.5
11.5 - 14.5m

Photo 01-BR.6
14.5 - 15.45m

Notes:

SPT Hammer No. 322914-34. SPT hammer energy ratio 96%
Hand-held shear vane measurements attempted in cohesive soils - no reliable data able to be retreived (core breakage when applying vane tests).

Started:	2/07/2024	*Finished:*	2/07/2024
Drilling Co.:	Geotech Drilling	*Drilling Rig:*	Sonicsampdrill CRS-T
Logged by:	R. Loomes	*Checked by:*	S. Hill

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.

Scale 1:50 @ A4

Borehole No. 01-PA

Project:	HBRC Pumpstation(s) Development	*Coordinates:*	1934971 E 5612525 N
Client:	Hawke's Bay Regional Council	*Ref. Grid:*	NZTM
Project No.:	2-S5717	*R.L.:*	6.5 m
Location:	Pakowhai Pumpstation	*Datum:*	NZ Vertical Datum 2016

Depth: 15.45 m
Inclination: Vertical

GEOLOGY	MAIN DESCRIPTION / DETAIL DESCRIPTION	R.L. (m)	DEPTH (m)	GRAPHIC LOG	TESTS: SPT 'N' VALUE	TESTS: SPT BLOW COUNTS OR SHEAR VALUE	CORE: CORE TYPE	CORE: TOTAL CORE RECOVERY (%)	DRILLING: DRILLING METHOD	DRILLING: CASING	DRILLING: BASE OF HOLE & WATER LEVEL	NOTES / OTHER TESTS	INSTALLATION DETAILS
Fill	SILT, with some sand; light brown. Stiff; moist; low plasticity; sand, fine.	6	0				Sonic	50	Sonic core drilling			0.00-4.50m - Approximate height of stopbank - base of fill uncertain.	Bentonite backfill
			1		15	5// 3/4/4/4	SPT	100					
	SILT, with trace organics; grey speckled black. Very stiff; moist; low plasticity; organics, rootlets and amorphous.	4	2				Sonic	100					
			3		6	2// 1/1/2/2	SPT	100					
	4.00m - becomes very stiff.		4				Sonic	100					
Heretaunga Formation Alluvium	SILT, with minor sand and clay; light brown with trace orange mottles. Stiff; moist; low to moderate plasticity; sand, fine.	2	5		5	2// 1/1/1/2	SPT	100					
	5.00m - becomes firm.						Sonic	100				Lab: 5.3-5.5m - PSD (with hydrometer); Atterberg Limit Set.	
	5.75m - becomes stiff.		6		3	0// 0/1/1/1	SPT	100			SWL 6.20m 3/07	6.20m - standing water level measured immediately after borehole completion.	
	6.50m - with minor clay.	0	7				Sonic	100			SWL 7.30m 4/07	7.30m - standing water level measured morning after completing drilling.	
	Fine SAND, with some silt; grey. Loosely packed; wet; uniformly graded.												
	Clayey SILT; grey. Soft; wet; high plasticity.				1	1// 1/0/0/0	SPT	100					
		-2	8				Sonic	100				Lab: 8.1-8.3m - PSD (with hydrometer); Atterberg Limit Set.	
	Fine SAND; with some silt; grey. Loose; wet; uniformly graded.		9		6	0// 1/1/2/2	SPT	100					
	Clayey SILT; with trace sand; grey. Firm; moist; high plasticity; sand, fine.						Sonic	100					

Notes:
SPT Hammer No. 322914-34. SPT hammer energy ratio 96%
Hand-held shear vane measurements attempted in cohesive soils - no reliable data able to be retreived (core breakage when applying vane tests).

Started: 3/07/2024 *Finished:* 3/07/2024
Drilling Co.: Geotech Drilling *Drilling Rig:* Sonicsampdrill CRS-T
Logged by: R. Loomes *Checked by:* S. Hill

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.

Scale 1:50 @ A4

Borehole No. 01-PA

Project:	HBRC Pumpstation(s) Development	*Coordinates:*	1934971 E 5612525 N
Client:	Hawke's Bay Regional Council	*Ref. Grid:*	NZTM
Project No.:	2-S5717	*R.L.:*	6.5 m
Location:	Pakowhai Pumpstation	*Datum:*	NZ Vertical Datum 2016

Depth: 15.45 m
Inclination: Vertical

GEOLOGY	MAIN DESCRIPTION / DETAIL DESCRIPTION	R.L. (m)	DEPTH (m)	GRAPHIC LOG	TESTS: SPT 'N' VALUE	TESTS: SPT BLOW COUNTS OR SHEAR VALUE	CORE: CORE TYPE	CORE: TOTAL CORE RECOVERY (%)	DRILLING: DRILLING METHOD	DRILLING: CASING	DRILLING: BASE OF HOLE & WATER LEVEL	NOTES / OTHER TESTS	INSTALLATION DETAILS
Heretaunga Formation Alluvium	Clayey SILT; with trace sand; grey. Firm; moist; high plasticity; sand, fine.*(continued)*	-4	11		0	0// 0/0/0/0	Sonic	100	Sonic core drilling			SPT: sinking under hammer weight.	Bentonite backfill
							SPT	100					
	Pumiceous fine to medium SAND; grey. Loosely packed; wet; poorly graded.												
	SILT, with some clay and organics; grey speckled dark brown. Firm; wet; low plasticity; organics, fibrous, woody fragments, highly decomposed. 11.50m - organics absent.		12				Sonic	100					
					5	0// 0/1/2/2	SPT	100					
	Silty fine SAND, with trace organics (as above); grey. Loose; wet; well graded.	-6	13				Sonic	100					
	Sandy SILT; grey. Soft; wet; low plasticity; sand, fine, present in thin interlayers typically appear <25mm thick.				28	6// 10/8/5/5	SPT	100					
			14										
	Fine SAND with minor silt; grey. Medium dense; wet; well graded.	-8					Sonic	100					
			15		12	3// 3/4/3/2	SPT	100					
	END OF BOREHOLE AT 15.45m - Target Depth Reached		16										
		-10	17										
			18										
		-12	19										

Notes:
SPT Hammer No. 322914-34. SPT hammer energy ratio 96%
Hand-held shear vane measurements attempted in cohesive soils - no reliable data able to be retreived (core breakage when applying vane tests).

Started: 3/07/2024
Finished: 3/07/2024
Drilling Co.: Geotech Drilling
Drilling Rig: Sonicsampdrill CRS-T
Logged by: R. Loomes
Checked by: S. Hill

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.
Scale 1:50 @ A4

Borehole No. 01-PA

Project:	HBRC Pumpstation(s) Development	*Coordinates:*	1934971 E 5612525 N		
Client:	Hawke's Bay Regional Council	*Ref. Grid:*	NZTM	*Depth:*	15.45 m
Project No.:	2-S5717	*R.L.:*	6.5 m	*Inclination:*	Vertical
Location:	Pakowhai Pumpstation	*Datum:*	NZ Vertical Datum 2016		

PHOTOGRAPHS

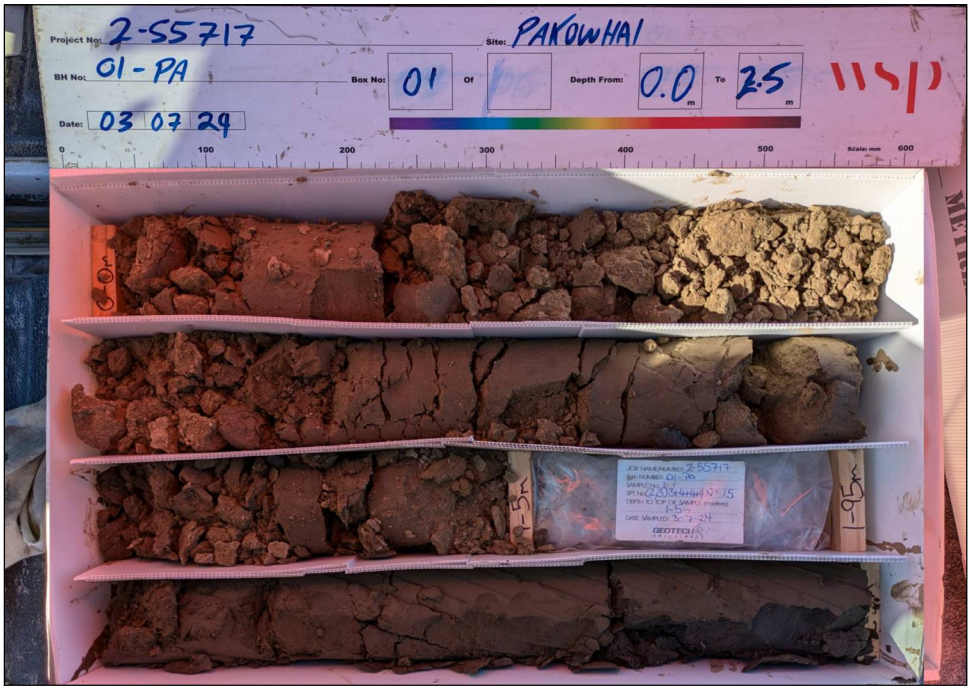


Photo 01-PA.1
0.0 - 2.5m

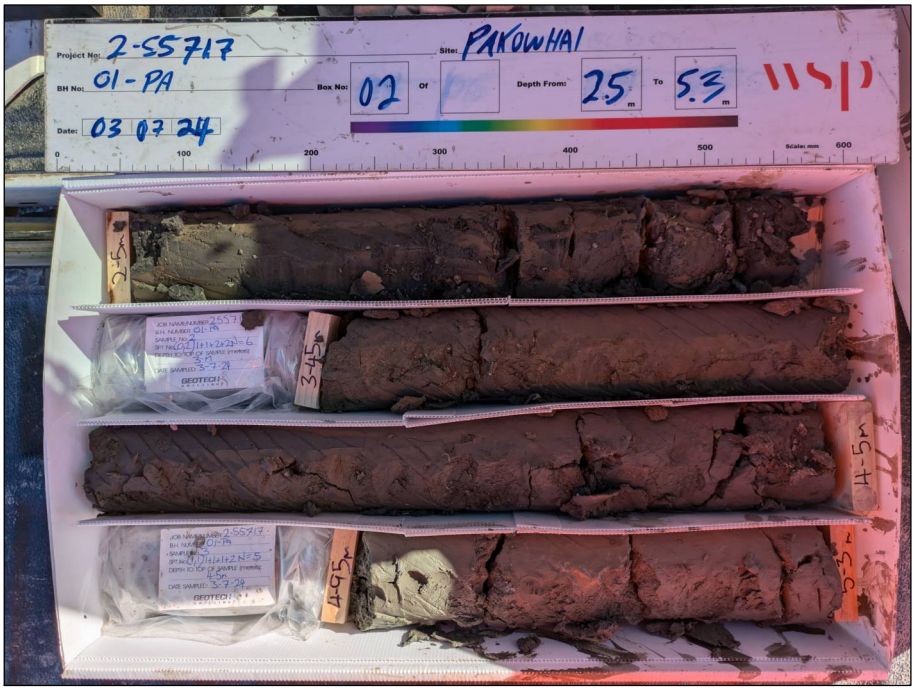


Photo 01-PA.2
2.5 - 5.3m

Notes:
SPT Hammer No. 322914-34. SPT hammer energy ratio 96%
Hand-held shear vane measurements attempted in cohesive soils - no reliable data able to be retreived (core breakage when applying vane tests).

Started:	3/07/2024	*Finished:*	3/07/2024
Drilling Co.:	Geotech Drilling	*Drilling Rig:*	Sonicsampdrill CRS-T
Logged by:	R. Loomes	*Checked by:*	S. Hill

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.
Scale 1:50 @ A4

Borehole No. 01-PA

Project:	HBRC Pumpstation(s) Development	*Coordinates:*	1934971 E 5612525 N		
Client:	Hawke's Bay Regional Council	*Ref. Grid:*	NZTM	*Depth:*	15.45 m
Project No.:	2-S5717	*R.L.:*	6.5 m	*Inclination:*	Vertical
Location:	Pakowhai Pumpstation	*Datum:*	NZ Vertical Datum 2016		

PHOTOGRAPHS

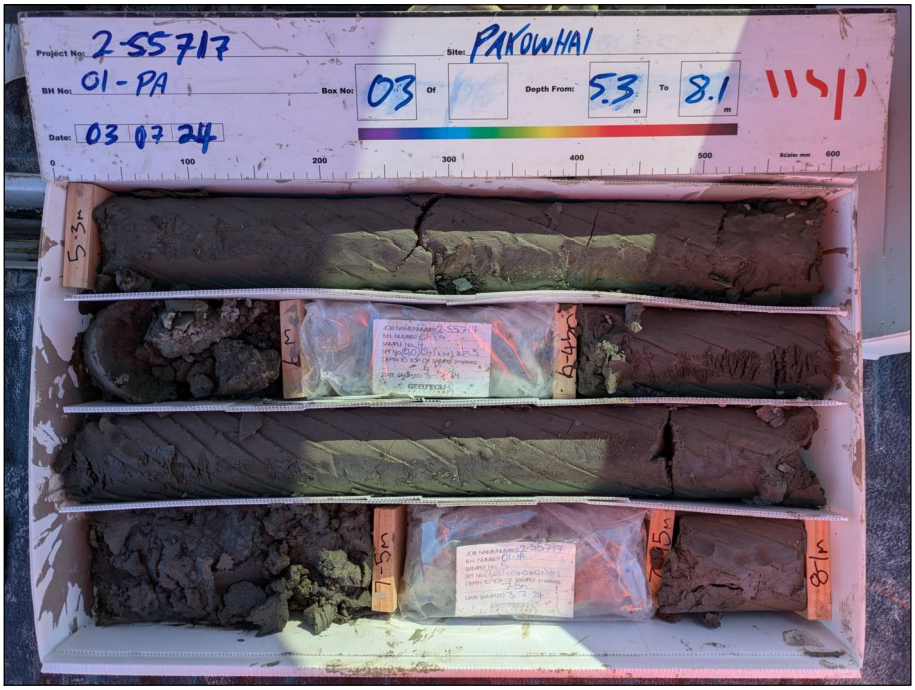


Photo 01-PA.3
5.3 - 8.1m

Photo 01-PA.4
8.1 - 10.95m

Notes:
SPT Hammer No. 322914-34. SPT hammer energy ratio 96%
Hand-held shear vane measurements attempted in cohesive soils - no reliable data able to be retreived (core breakage when applying vane tests).

Started:	3/07/2024	*Finished:*	3/07/2024
Drilling Co.:	Geotech Drilling	*Drilling Rig:*	Sonicsampdrill CRS-T
Logged by:	R. Loomes	*Checked by:*	S. Hill

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.
Scale 1:50 @ A4

Borehole No. 01-PA

Project:	HBRC Pumpstation(s) Development	*Coordinates:*	1934971 E 5612525 N		
Client:	Hawke's Bay Regional Council	*Ref. Grid:*	NZTM	*Depth:*	15.45 m
Project No.:	2-S5717	*R.L.:*	6.5 m	*Inclination:*	Vertical
Location:	Pakowhai Pumpstation	*Datum:*	NZ Vertical Datum 2016		

PHOTOGRAPHS

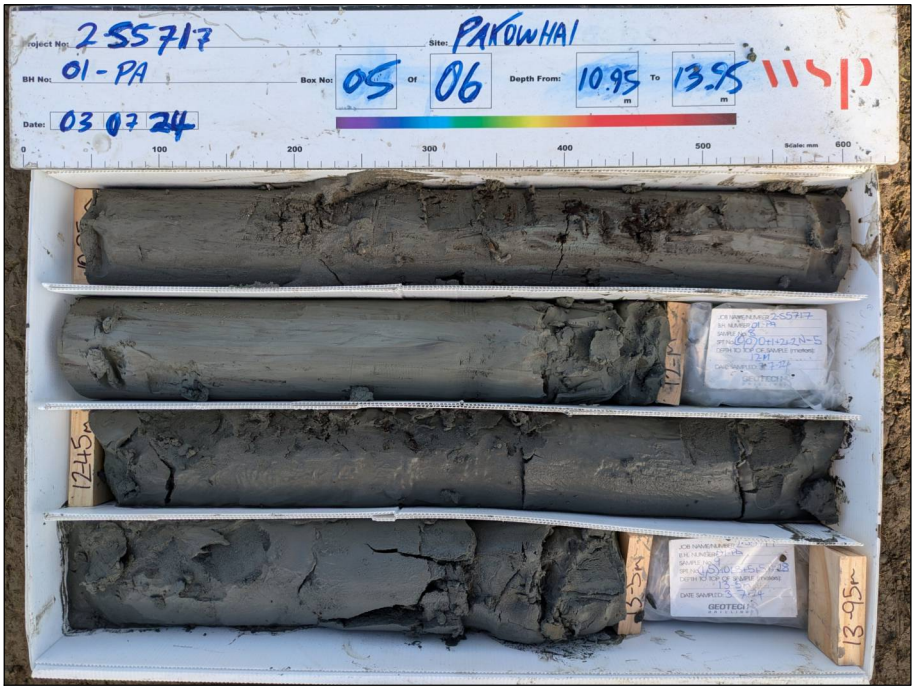


Photo 01-PA.5
10.95 - 13.95m

Photo 01-PA.6
13.95 - 15.45m

Notes:
SPT Hammer No. 322914-34. SPT hammer energy ratio 96%
Hand-held shear vane measurements attempted in cohesive soils - no reliable data able to be retreived (core breakage when applying vane tests).

Started:	3/07/2024	*Finished:*	3/07/2024
Drilling Co.:	Geotech Drilling	*Drilling Rig:*	Sonicsampdrill CRS-T
Logged by:	R. Loomes	*Checked by:*	S. Hill

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.

Scale 1:50 @ A4

Borehole No. 02-PA

Project:	HBRC Pumpstation(s) Development	*Coordinates:*	1934971 E 5612525 N
Client:	Hawke's Bay Regional Council	*Ref. Grid:*	NZTM
Project No.:	2-S5717	*R.L.:*	1.2 m
Location:	Pakowhai Pumpstation	*Datum:*	NZ Vertical Datum 2016

Depth: 15.45 m
Inclination: Vertical

GEOLOGY	MAIN DESCRIPTION / DETAIL DESCRIPTION	R.L. (m)	DEPTH (m)	GRAPHIC LOG	TESTS: SPT 'N' VALUE	TESTS: SPT BLOW COUNTS OR SHEAR VALUE	CORE: CORE TYPE	CORE: TOTAL CORE RECOVERY (%)	DRILLING: DRILLING METHOD	DRILLING: CASING	DRILLING: BASE OF HOLE & WATER LEVEL	NOTES / OTHER TESTS	INSTALLATION DETAILS
Fill	Sandy, silty, fine to coarse GRAVEL; brown. Tightly packed; moist; poorly graded; gravel, rounded, sandstone; sand, fine.		1				Sonic	20	Sonic core drilling				Bentonite backfill
		0											
	SILT, with some clay and minor gravel; light brownish grey with some orange mottles. Very soft; wet; moderate palsticity; gravel, fine, sub-angular, mudstone, highly weathered.		2		3	1// 0/1/1/1	SPT	50					
	SILT, with some clay; light brownish grey. Very soft; wet; moderate plasticity.						Sonic	100			SWL 3.10m 3/07		
	SILT, with some organics and clay; grey speckled black. Soft; wet, low plasticity; organics, amorphous.											2.50m - standing water level measured immediately after borehole completion.	
	Clayey SILT; grey. Firm; moist; high plasticity.	-2	3		1	0// 0/0/0/1	SPT	100					
	SILT, with some clay; grey. Firm; moist; low plasticity.						Sonic	100					
	Pumiceous fine SAND; light grey. Loosely packed; wet; uniformly graded.		4										
	Clayey SILT; grey. Soft; moist; high plasticity.											Lab: 4.25-4.45m - PSD (with hydrometer); Atterberg Limit Set. SPT:sinking under hammer weight.	
	Organic SILT; brownish grey speckled dark brown. Soft; wet; low plasticity; organics, mostly amorphous with some intact wood fragments (fibrous).		5		0	0// 0/0/0/0	SPT	100					
	PEAT/WOOD, with some silt; dark brown. Firm, fibrous, slightly decomposed, not compressible by hand.	-4											
	SILT, with some clay and trace organics; grey speckled dark brown. Soft; wet; low plasticity; organics, amorphous.						Sonic	100					
	5.80m - with some fine sand.		6										
	Silty fine SAND; grey. Very loose; wet; well graded.				1	0// 0/0/0/1	SPT	100					
	Sandy SILT; grey. Soft; wet; low plasticity; sand, fine.	-6	7				Sonic	100					
	Fine SAND, with minor silt and trace shells; grey. Medium dense; wet; poorly graded.				11	1// 2/3/3/3	SPT	100					
			8									Lab: 8.0-8.2m - PSD (with hydrometer); Atterberg Limit Set.	
							Sonic	100					
	Silty fine SAND; grey. Medium dense; wet; well graded.	-8	9		15	3// 5/3/3/4	SPT	100					
							Sonic	100					
	SILT; grey. Soft; wet; low plasticity.												

Heretaunga Formation Alluvium

Notes:

SPT Hammer No. 322914-34. SPT hammer energy ratio 96%
Hand-held shear vane measurements attempted in cohesive soils - no reliable data able to be retreived (core breakage when applying vane tests).

Started:	4/07/2024	*Finished:*	4/07/2024
Drilling Co.:	Geotech Drilling	*Drilling Rig:*	Sonicsampdrill CRS-T
Logged by:	R. Loomes	*Checked by:*	S. Hill

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.

Scale 1:50 @ A4

Borehole No. 02-PA

Project:	HBRC Pumpstation(s) Development	*Coordinates:*	1934971 E 5612525 N
Client:	Hawke's Bay Regional Council	*Ref. Grid:*	NZTM
Project No.:	2-S5717	*R.L.:*	1.2 m
Location:	Pakowhai Pumpstation	*Datum:*	NZ Vertical Datum 2016

Depth: 15.45 m
Inclination: Vertical

GEOLOGY	MAIN DESCRIPTION / DETAIL DESCRIPTION	R.L. (m)	DEPTH (m)	GRAPHIC LOG	TESTS: SPT 'N' VALUE	TESTS: SPT BLOW COUNTS OR SHEAR VALUE	CORE: CORE TYPE	CORE: TOTAL CORE RECOVERY (%)	DRILLING: DRILLING METHOD	DRILLING: CASING	DRILLING: BASE OF HOLE & WATER LEVEL	NOTES / OTHER TESTS	INSTALLATION DETAILS
Heretaunga Formation Alluvium	Sandy SILT, with some shells; grey. Firm; wet; non-plastic; sand, fine.						Sonic	100	Sonic core drilling				Bentonite backfill
	Clayey SILT; grey. Soft; wet; high plasticity.				0	0// 0/0/0/0	SPT	100				SPT:sinking under hammer weight.	
	Silty fine SAND, with some shells; grey. Loosely packed; wet; well graded.	-10	11				Sonic	100					
	SILT; grey. Soft; wet; low plasticity.		12		0	1// 0/0/0/0	SPT	100				SPT:sinking under hammer weight.	
	Sandy SILT; grey. Soft; wet; low plasticity; sand, fine, present in thin interlayers typically appear <25mm thick.		13				Sonic	100					
	SILT, with some clay; grey. Soft; wet; low palsticity.	-12											
	Sandy SILT; grey. Soft; wet; low plasticity; sand, fine, present in thin interlayers typically appear <25mm thick.				0	1// 0/0/0/0	SPT	100				SPT:sinking under hammer weight.	
	Silty fine SAND; grey. Loosely packed; wet; well graded.		14				Sonic	100					
	Sandy SILT, with trace shells; grey. Soft; wet; non-plastic; sand, fine.												
	Fine SAND, with trace shells; grey. Medium dense; wet; uniformly graded.	-14	15		21	4// 2/4/7/8	SPT	100					
	END OF BOREHOLE AT 15.45m - Target Depth Reached	-16	16 17										
		-18	18 19										

Notes:
SPT Hammer No. 322914-34. SPT hammer energy ratio 96%
Hand-held shear vane measurements attempted in cohesive soils - no reliable data able to be retreived (core breakage when applying vane tests).

Started: 4/07/2024
Finished: 4/07/2024
Drilling Co.: Geotech Drilling
Drilling Rig: Sonicsampdrill CRS-T
Logged by: R. Loomes
Checked by: S. Hill

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.
Scale 1:50 @ A4

Borehole No. 02-PA

Project:	HBRC Pumpstation(s) Development	*Coordinates:*	1934971 E 5612525 N		
Client:	Hawke's Bay Regional Council	*Ref. Grid:*	NZTM	*Depth:*	15.45 m
Project No.:	2-S5717	*R.L.:*	1.2 m	*Inclination:*	Vertical
Location:	Pakowhai Pumpstation	*Datum:*	NZ Vertical Datum 2016		

PHOTOGRAPHS

Photo 02-PA.1
0.0 - 3.8m

Photo 02-PA.2
3.8 - 6.45m

Notes:
SPT Hammer No. 322914-34. SPT hammer energy ratio 96%
Hand-held shear vane measurements attempted in cohesive soils - no reliable data able to be retreived (core breakage when applying vane tests).

Started:	4/07/2024	*Finished:*	4/07/2024
Drilling Co.:	Geotech Drilling	*Drilling Rig:*	Sonicsampdrill CRS-T
Logged by:	R. Loomes	*Checked by:*	S. Hill

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.

Scale 1:50 @ A4

Borehole No. 02-PA

Project:	HBRC Pumpstation(s) Development	*Coordinates:*	1934971 E 5612525 N
Client:	Hawke's Bay Regional Council	*Ref. Grid:*	NZTM
Project No.:	2-S5717	*R.L.:*	1.2 m
Location:	Pakowhai Pumpstation	*Datum:*	NZ Vertical Datum 2016

Depth: 15.45 m
Inclination: Vertical

PHOTOGRAPHS

Photo 02-PA.3
6.6 - 9.45m

Photo 02-PA.4
9.45 - 12m

Notes:
SPT Hammer No. 322914-34. SPT hammer energy ratio 96%
Hand-held shear vane measurements attempted in cohesive soils - no reliable data able to be retreived (core breakage when applying vane tests).

Started:	4/07/2024	*Finished:*	4/07/2024
Drilling Co.:	Geotech Drilling	*Drilling Rig:*	Sonicsampdrill CRS-T
Logged by:	R. Loomes	*Checked by:*	S. Hill

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.
Scale 1:50 @ A4

Borehole No. 02-PA

Project:	HBRC Pumpstation(s) Development	*Coordinates:*	1934971 E 5612525 N		
Client:	Hawke's Bay Regional Council	*Ref. Grid:*	NZTM	*Depth:*	15.45 m
Project No.:	2-S5717	*R.L.:*	1.2 m	*Inclination:*	Vertical
Location:	Pakowhai Pumpstation	*Datum:*	NZ Vertical Datum 2016		

PHOTOGRAPHS

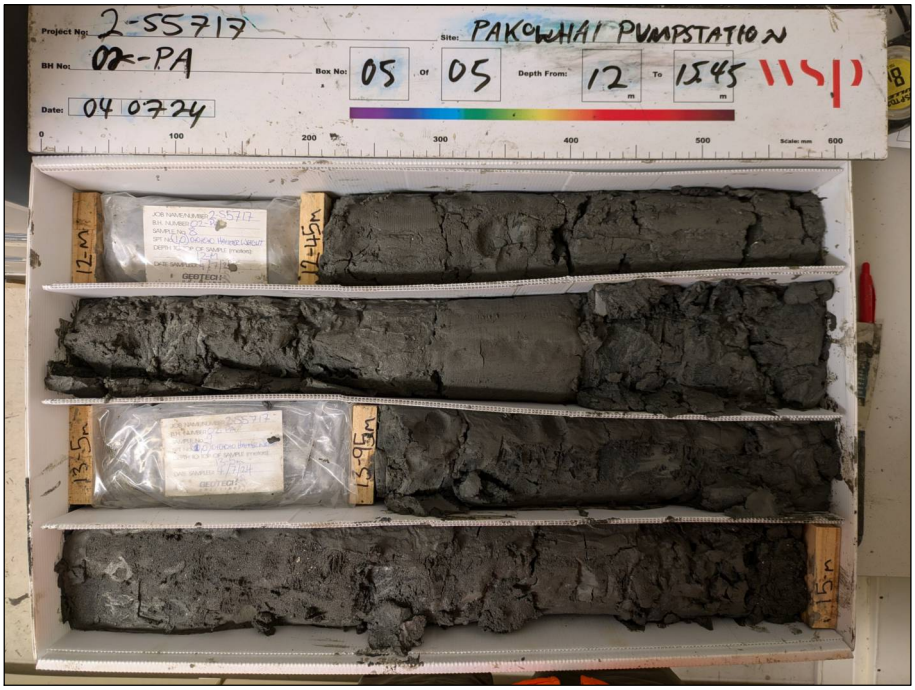


Photo 02-PA.5
12 - 15.45m

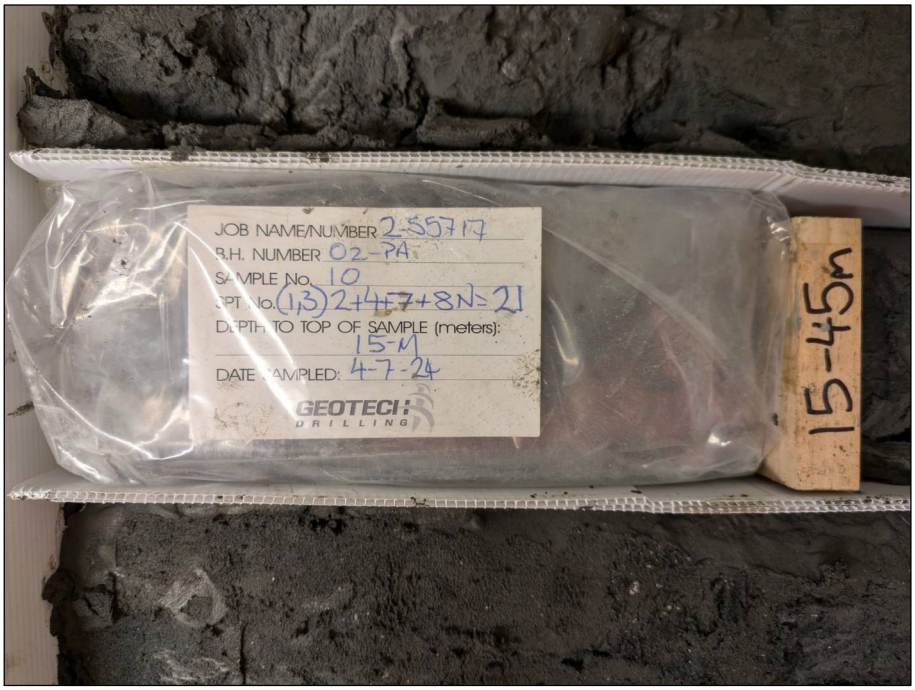


Photo 02-PA.6
15 - 15.45m SPT sample (stored additional within BOX06)

Notes:
SPT Hammer No. 322914-34. SPT hammer energy ratio 96%
Hand-held shear vane measurements attempted in cohesive soils - no reliable data able to be retreived (core breakage when applying vane tests).

Started:	4/07/2024	*Finished:*	4/07/2024
Drilling Co.:	Geotech Drilling	*Drilling Rig:*	Sonicsampdrill CRS-T
Logged by:	R. Loomes	*Checked by:*	S. Hill

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.

Scale 1:50 @ A4

Engineering Log Terminology

Common Abbreviations and Symbols

Drilling Method / Sample Type:

DT	Dual Tube	**SPT**	Split Spoon SPT
HA	Hand Auger	**SC**	Solid Cone SPT
HQ	HQ Triple Tube	**PT**	Thin-wall Push Tube
PQ	PQ Triple Tube		
OB	Open Barrel		
SNC	Sonic Drilling		
VE	Vacuum Excavation		
WD	Wash Drilling		

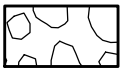
Field / Laboratory Tests:

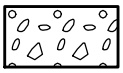
SV	Field Shear Vane	**UUTx**	Unconsolidated Undrained Triaxial
PP	Pocket Penetrometer	**CUTx**	Consolidated Undrained Triaxial
PSD	Particle Size Distribution	**UCS**	Uniaxial Compressive Strength
Oed	1D Consolidation	**PL**	Point Load

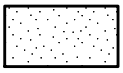
Graphic Log Symbols for Soils and Rocks *(after BS 5930:1981)*

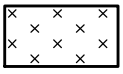
Soils

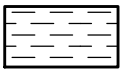

Fill

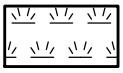

Boulders and cobbles


Gravel

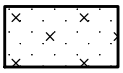

Sand


Silt


Clay


Peat

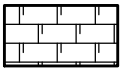
NOTE: Composite soil types are depicted by combined symbols, e.g.:

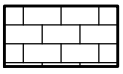

Silty sand

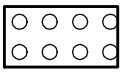
Rocks

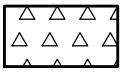
Sedimentary

Rudaceous

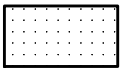

Chalk

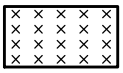

Limestone


Conglomerate

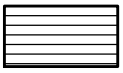

Breccia

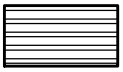
Arenaceous


Sandstone

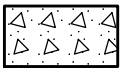

Siltstone

Argillaceous

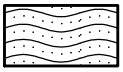

Mudstone

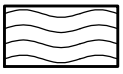

Shale

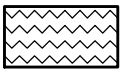

Coal


Pyroclastic (volcanic ash)

Metamorphic

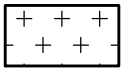

Coarse-grained

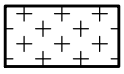

Medium-grained

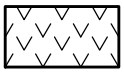

Fine-grained

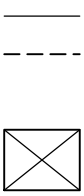
Colour Scheme:

Igneous


Coarse-grained


Medium-grained


Fine-grained



Soil Descriptions

Soil and rock descriptions follow the NZ Geotechnical Society (2005) "Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes".

Grain Size Terms

Major	Subdivision	Particle Size
Boulders		> 200 mm
Cobbles		60 mm - 200 mm
Gravel	Coarse	20 mm - 60 mm
	Medium	6 mm - 20 mm
	Fine	2 mm - 6 mm
Sand	Coarse	0.6 mm - 2 mm
	Medium	0.2 mm - 0.6 mm
	Fine	0.06 mm - 0.2 mm
Silt		0.002 mm - 0.06 mm
Clay		< 0.002 mm

Proportional Terms (Coarse Soils)

Fraction	Term	% of soil mass	Example
Major	(UPPER CASE)	Major constituent	GRAVEL
Subordinate	(lower case)	> 20	Sandy
Minor	with some...	12 - 20	with some sand
	with minor...	5 - 12	with minor sand
	with trace of...	< 5	with trace of sand

Consistency / Density Terms

Consistency	S_u (kPa)	Density	R_D (%)	SPT (N)
Very Soft	< 12	Very loose	< 15	< 4
Soft	12 - 25	Loose	15 - 35	4 - 10
Firm	25 - 50	Medium Dense	35 - 65	10 - 30
Stiff	50 - 100	Dense	65 - 85	30 - 50
Very Stiff	100 - 200	Very Dense	> 85	> 50
Hard	> 200			*SPT values are uncorrected*

Soil Descriptions *(continued)*

Particle Shape Terms:

Rounded	Subrounded	Subangular	Angular
			

Rock and Discontinuity Descriptions

Strength:

ES	Extremely Strong
VS	Very Strong
S	Strong
MS	Moderately Strong
W	Weak
VW	Very Weak
EW	Extremely Weak

Weathering:

UW	Unweathered
SW	Slightly weathered
MW	Moderately weathered
HW	Highly weathered
CW	Completely weathered
RS	Residual soil

Spacing:

VW	Very wide (>2 m)
W	Wide (600 mm - 2 m)
MW	Moderately wide (200 mm - 600 mm)
C	Close (60 mm - 200 mm)
VC	Very close (20 mm - 60 mm)
EC	Extremely close (<20 mm)

Discontinuity Type:

B	Bedding	
J	Joint	
C	Cleavage	
F	Foliation	
DD	Drilling Defect	
GZ	Gouge Zone	
SHZ	Shattered Zone	
SZ	Shear Zone	
CZ	Crush Zone	
DZ	Decomposed Zone	
IZ	Infilled Zone/Seam	

Discontinuity Roughness:

RO	Rough
SM	Smooth
SL	Slickensided

Discontinuity Shape:

ST	Stepped
UN	Undulating
PL	Planar

Discontinuity Aperture:

T	Tight
VN	Very Narrow (0 - 2 mm)
N	Narrow (2 mm - 6 mm)
MN	Moderately Narrow (6 mm - 20 mm)
MW	Moderately Wide (20 mm - 60 mm)
W	Wide (60 mm - 200 mm)
VW	Very Wide (> 200 mm)

Bedding Descriptions

Bedding Thickness Terms:

Term	Thickness
Thinly laminated	< 2 mm
Laminated	2 mm - 6 mm
Very thin	6 mm - 20 mm
Thin	20 mm - 60 mm
Moderately thin	60 mm - 200 mm
Moderately thick	0.2 m - 0.6 m
Thick	0.6 m - 2 m
Very thick	> 2 m

Bedding Inclination Terms:

Term	Inclination
Sub-horizontal	0° - 5°
Gently inclined	6° - 15°
Moderately inclined	16° - 30°
Steeply inclined	31° - 60°
Very steeply inclined	61° - 80°
Sub-vertical	81° - 90°
	From horizontal

Sally McKinnon

From: JP Neethling <JP.Neethling@hbrc.govt.nz>
Sent: Thursday, 22 August 2024 12:54 pm
To: Sally McKinnon
Cc: Louise Van Jaarsveldt
Subject: FW: Pump stations - Preliminary Site Investigations

Please see below.

Thanks,

JP

JP Neethling
Senior Project Manager
06 835 9200 | 027 421 1406
Hawke's Bay Regional Council | Te Kaunihera ā-rohe o Te Matau a Māui
159 Dalton Street, Napier 4110 | hbrc.govt.nz
Enhancing Our Environment Together | Te Whakapakari Tahi I Tō Tātau Taiao

From: Michelle Mackintosh <Michelle.Mackintosh@hbrc.govt.nz>
Sent: Thursday, August 22, 2024 12:01 PM
To: JP Neethling <JP.Neethling@hbrc.govt.nz>
Subject: RE: Pump stations - Preliminary Site Investigations

Thanks JP, please see contaminated land summary below:

Awatoto Pumpstation (Lot 1 DP 6287):

This site is currently not listed on Hawke's Bay Regional Council's Listed Land Use Register, and Council does not hold any information relating to hazardous activities at this address. This does not mean that an activity with the potential to cause contamination has never occurred, or is not currently occurring there.
Please note adjacent parcels belonging to Ravensdown Ltd (Lot 2 DP 16060 and Part Section 32 Block I Clive SD) are listed on Hawke's Bay Regional Council's Listed Land Use Register as follows:

Site ID: SLS-10706
Address: Waitangi Road, Napier, Ravensdown Ltd
HAIL activity: A6. Fertiliser manufacture or bulk storage
Sub-category: Verified HAIL
Sub-category description: Risk Not Quantified

Brookfields Pumpstation (Lot 1 DEEDS 929):

This site is also not currently listed on Hawke's Bay Regional Council's Listed Land Use Register. No adjacent sites are known to be HAIL.

Pakowhai Pumpstation (Part PUNINGA 4A3 BLK XII HERETAUNGA S D -INT IN R O W):

This site is also not currently listed on Hawke's Bay Regional Council's Listed Land Use Register. No adjacent sites are known to be HAIL.

Let me know if there's anything else I can help with.

Thanks,

Michelle

Michelle Mackintosh
Environmental Compliance Officer - Urban & Industrial
0800 108 838 | 06 835 9200
Hawke's Bay Regional Council | Te Kaunihera ā-rohe o Te Matau a Māui
159 Dalton Street, Napier 4110 | hbrc.govt.nz
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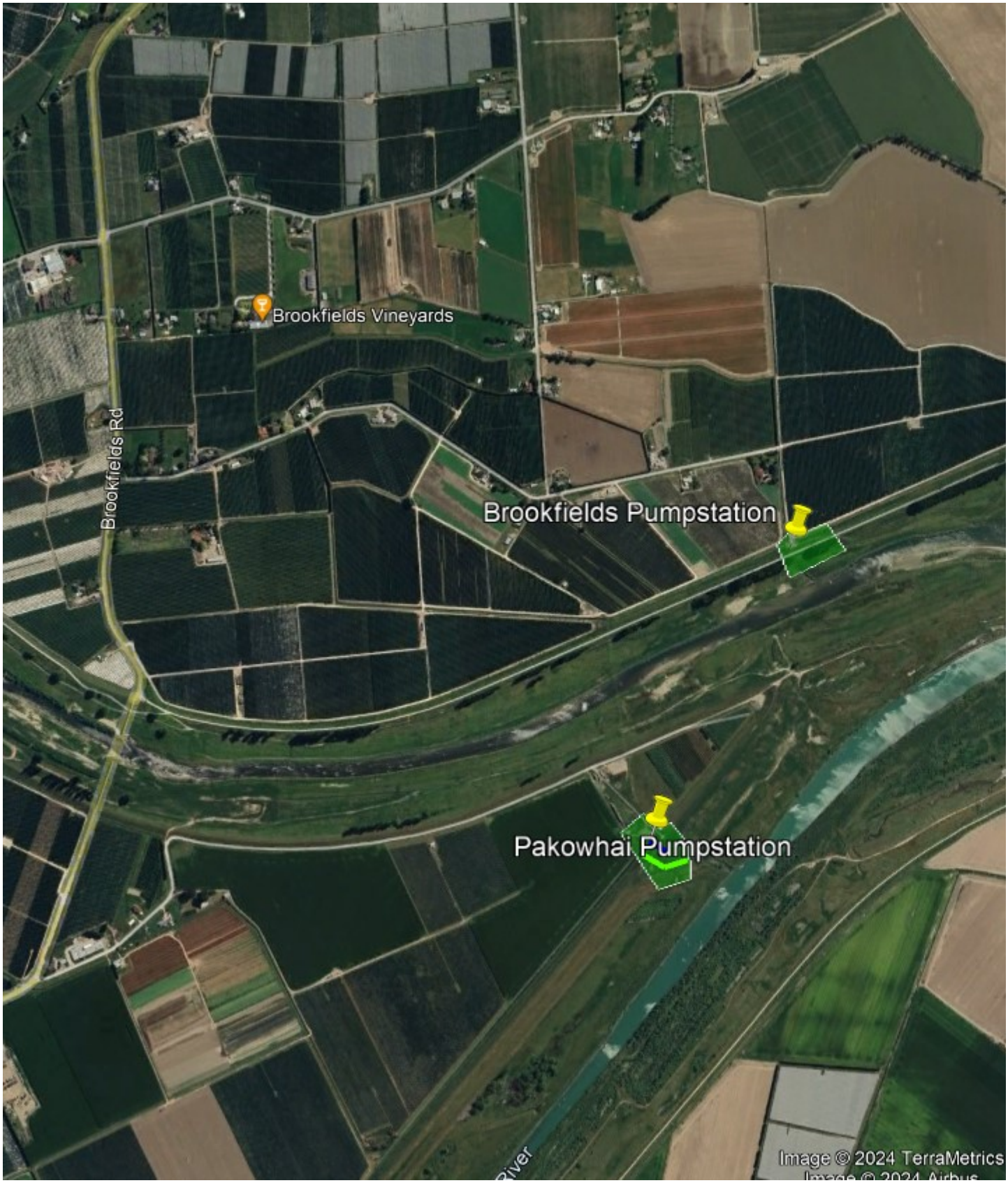
From: JP Neethling <JP.Neethling@hbrc.govt.nz>
Sent: Thursday, August 22, 2024 9:57 AM
To: Michelle Mackintosh <Michelle.Mackintosh@hbrc.govt.nz>
Subject: RE: Pump stations - Preliminary Site Investigations

I can send a kmz file as well if that helps.

Please see below:



JP Neethling
Senior Project Manager
06 835 9200 | 027 421 1406

Hawke's Bay Regional Council | Te Kaunihera ā-rohe o Te Matau a Māui
159 Dalton Street, Napier 4110 | hbrc.govt.nz
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From: Michelle Mackintosh <Michelle.Mackintosh@hbrc.govt.nz>
Sent: Thursday, August 22, 2024 9:28 AM
To: JP Neethling <JP.Neethling@hbrc.govt.nz>
Subject: RE: Pump stations - Preliminary Site Investigations

Hi JP,

I can take a look for you, do they have addresses? Or if you could do a snip of where they are on a map that would be great.

Thanks,

Michelle

Michelle Mackintosh
Environmental Compliance Officer - Urban & Industrial
0800 108 838 | 06 835 9200
Hawke's Bay Regional Council | Te Kaunihera ā-rohe o Te Matau a Māui
159 Dalton Street, Napier 4110 | hbrc.govt.nz
Enhancing Our Environment Together | Te Whakapakari Tahi I Tō Tātau Taiao

From: JP Neethling <JP.Neethling@hbrc.govt.nz>
Sent: Wednesday, August 21, 2024 12:14 PM
To: Michelle Mackintosh <Michelle.Mackintosh@hbrc.govt.nz>
Subject: RE: Pump stations - Preliminary Site Investigations

Hi Michelle

I hope you are well.

We are currently preparing a PSI report for the NIWE Pumpstation Projects upgrades. Do you have any information about the contaminated land at the listed sites below?:

1. Awatoto pump station – Lot 1 DP 6287
2. Brookfield Pumpstation – Lot 1 DEEDS 929
3. Pakowai Pumpstation - Part PUNINGA 4A3 BLK XII HERETAUNGA S D -INT IN R O W

I'm happy to come to you if that helps.

Thanks.

JP Neethling
Senior Project Manager
06 835 9200 | 027 421 1406
Hawke's Bay Regional Council | Te Kaunihera ā-rohe o Te Matau a Māui
159 Dalton Street, Napier 4110 | hbrc.govt.nz
Enhancing Our Environment Together | Te Whakapakari Tahi I Tō Tātau Taiao

From: Sally McKinnon <sally.mckinnon@pdp.co.nz>
Sent: Wednesday, August 21, 2024 8:47 AM
To: Louise Van Jaarsveldt <Louise.VanJaarsveldt@hbrc.govt.nz>
Cc: JP Neethling <JP.Neethling@hbrc.govt.nz>
Subject: RE: Pump stations - Preliminary Site Investigations

Good morning Louise

Thank you for your help.

I can access all the data online but I am always aware that there is somethings not online. If you could talk to your team (I think it is compliance?) about the contaminated land search? I can do it, but I know it costs.

Thank you for Paul's number, I will get in touch with him.

Cheers
Sally

From: Louise Van Jaarsveldt <Louise.VanJaarsveldt@hbrc.govt.nz>
Sent: Wednesday, August 21, 2024 8:41 AM
To: Sally McKinnon <sally.mckinnon@pdp.co.nz>
Cc: JP Neethling <JP.Neethling@hbrc.govt.nz>
Subject: RE: Pump stations - Preliminary Site Investigations

Morning Sally,

JP and I will do some digging and get back to you as soon as possible.

Also please say if you struggle to get access to the sites and I can see if someone else can assist with the site visits.

Paul' mobile number is 027 457 1306, he is the senior engineering officer for our Ops team.

Thanks

Louise

Louise Van Jaarsveldt
Environmental Officer
06 835 9200 | 027 572 2116
Hawke's Bay Regional Council | Te Kaunihera ā-rohe o Te Matau a Māui
159 Dalton Street, Napier 4110 | hbrc.govt.nz
Enhancing Our Environment Together | Te Whakapakari Tahi I Tō Tātau Taiao

From: Sally McKinnon <sally.mckinnon@pdp.co.nz>
Sent: Tuesday, August 20, 2024 1:18 PM
To: Louise Van Jaarsveldt <Louise.VanJaarsveldt@hbrc.govt.nz>
Subject: Pump stations - Preliminary Site Investigations

Hi Louise

Are you able to get me any of the property files HBRC has for:

1. Awatoto pumpstation – Lot 1 DP 6287
2. Brookfield Pumpstation – Lot 1 DEEDS 929
3. Pakowai Pumpstation - Part PUNINGA 4A3 BLK XII HERETAUNGA S D -INT IN R O W

There is not much available through Napier City Council and Hastings District Council, so I am just checking what HBRC has, as a matter of due diligence. This may include any investigations associated with the pump stations, when the pumpstations were constructed, any issues with the pump stations, were they run by generator at any point in time, were the pumpstations rebuilt / upgraded at any time. We use this to confirm what we are seeing in aerial photographs, and to see if there are any triggers regarding HAIL.

Kind Regards

Sally

Sally McKinnon | Contaminated Land
PATTLE DELAMORE PARTNERS LTD
Level 2* | 9 Customs Quay, Ahuriri, Napier 4110
Mob - +64 211 950 980

* The Napier Office is located on Level 2 of 9 Customs Quay. Access is via the door at the rear of the building on the east side of the building. Access to the building is by swipe card only.

Official Information Request

MN

Maria Norrelle <marian@hdc.govt.nz>

To Nicole Bidart

5/09/2024

Hi Nicole
Further to your LGOIMA request we received 2 September 2024, I have transferred this to Hawke's Bay Regional Council as the Pakowhai Pump Station is their asset.
Regards
Maria

Maria Norrelle
Democracy & Governance Support Officer

HERETAUNGA HASTINGS DISTRICT COUNCIL

Wāea/Phone (06) 871 5110 ext 5501 | **Wāea Pūkoro/Mobile** 027 204 1648
Īmēra/Email marian@hdc.govt.nz | **Pae Tukutuku/Web** www.hastingsdc.govt.nz
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Private Bag 9002, Hastings 4156, New Zealand

Attention:

RE: HBRC Contaminated Land Enquiry Pakowhai Pumpstation

contaminated.land <contaminated.land@hbrc.govt.nz>
To Nicole Bidart

Reply | Reply All | Forward

Mon 2/09/2024 10:21 am

You replied to this message on 2/09/2024 10:27 am.

Hi Nicole,

Thanks for your enquiry relating to contaminated land information held by Hawke's Bay Regional Council for the Pakowhai Pumpstation.

This site is currently not listed on Hawke's Bay Regional Council's Selected Land Use Register, and Council does not hold any information relating to hazardous activities at this address. This does not mean that an activity with the potential to cause contamination has never occurred, or is not currently occurring there.

We have recently added a contaminated sites map layer with public access to the Hawke's Bay Hazard Portal, please go to https://gis.hbrc.govt.nz/hazards/ for any future enquiries. This will provide you with basic information e.g. site listing, category and industry type.

Ngā mihi

Michelle Mackintosh
Environmental Compliance Officer - Urban & Industrial
0800 108 838 | 06 835 9200
Hawke's Bay Regional Council | Te Kaunihera ā-rohe o Te Matau a Māui
159 Dalton Street, Napier 4110 | hbrc.govt.nz
Enhancing Our Environment Together | Te Whakapakari Tahi I Tō Tātau Taiao

From: Wufoo <no-reply@wufoo.com>
Sent: Monday, September 2, 2024 9:52 AM
To: contaminated.land <contaminated.land@hbrc.govt.nz>
Subject: HBRC Contaminated land enquiry form [#313]

Hawke's Bay Regional Council
Safeguarding Your Environment

Resource Consent

In accordance with Rule 50 of the Proposed Regional Resource Management Plan (June 2001) and the provisions of the Resource Management Act 1991, and subject to the attached conditions, the Hawke's Bay Regional Council (the Council) grants a resource consent for a discretionary activity to:

Hawke's Bay Regional Council
Private Bag 6006
NAPIER

to discharge contaminants (drain cleanings) onto land in circumstances which may result in the contaminant (or any other contaminant emanating as a result of natural processes from that contaminant) entering water.

LOCATION

Address of site: Various Sites around the Napier/Hastings area, owned by the Hawke's Bay Regional Council and within the Heretaunga Plains Land Drainage and Flood Control Scheme Area.

CONSENT DURATION

This consent is granted for a period expiring on 31 May 2025.

LAPSING OF CONSENT

This consent shall lapse in accordance with s.125 on 15 October 2009 if it is not exercised before that date.

Murray Buchanan
GROUP MANAGER - ENVIRONMENTAL MANAGEMENT
Under authority delegated by the Hawke's Bay Regional Council
15 October 2004

CONDITIONS

1. All works and structures relating to this resource consent shall be designed and constructed to conform to the best engineering practices and at all times maintained to a safe and serviceable standard.

2. The consent holder shall undertake all operations in accordance with any drawings, specifications, statements of intent and other information supplied as part of the application for this resource consent. In the event that there is conflict between the information supplied with the application and any consent condition(s), the condition(s) shall prevail.

3. No material sourced from the red diagonally hatched areas shown in the attached maps shall be discharged in accordance with this consent.

    - Map of Hastings Drainage Area – Drain Disposal Demarcation Zone
    - Map of Napier Drainage Area - Drain Disposal Demarcation Zone

4. Depositing of material to the sites authorised by this consent shall only be by the consent holder or other persons authorised by the consent holder.

5. The material shall only be deposited onto land owned by the consent holder and that land being part of the Heretaunga Plains Land Drainage and Flood Control Scheme Area. The consent holder shall advise the Hawke's Bay Regional Council (Environmental Regulation section) of any new sites to be used for the deposition of drain cleanings. Known sites at the date this consent was granted include:

Site	**Legal description**	**Map reference**
Tutaekuri/Ngaruroro Rivers at Sissons Rd	Lot 5 DP 4853	V21: 2845285 - 6174559
Ngaruroro River at Ormond Road	Pt Lot 28 DP 140	V21: 2841464 - 6170993
Irongate Stream at Riverslea Road	Pt Sec 6 & 7 SO 10525	V21: 2838087 - 6163511
Tutaekuri River at Moteo	Pt Lot 1 DP 16025	V21: 2834987 - 6181187
Tutaekuri River at Omarunui Road	Pt 3N SO 6255	V21: 2836400 - 6179656
Karamu Stream at Havelock North	SO8357	V21: 2843288 - 6164625
Tutaekuri River at Springfield Road	Pt Lot 2 DP	V21: 2837212 -

	325	6177279

6. The discharge shall not result in any offensive or objectionable odour to the extent that it causes an adverse effect at or beyond the boundary of the subject property.

7. No material shall be deposited within 20m of either a permanently flowing watercourse or the boundary with any neighbouring property.

8. The deposited material shall be periodically levelled and sown in pasture, planted with trees, or otherwise allowed to naturally revegetate.

9. The consent holder shall remove as much as practicable inorganic material from each load.

REVIEW OF CONSENT CONDITIONS BY THE COUNCIL

The Council may review conditions of this consent pursuant to sections 128 through 132 of the Resource Management Act 1991. The actual and reasonable costs of any review undertaken will be charged to the consent holder, in accordance with s.36(1) of the Resource Management Act.

Times of service of notice of any review: During the months of May 2005, May 2007, May 2011, May 2016 and May 2021.

Purposes of review:

- To deal with any adverse effect on the environment which may arise from the exercise of this consent, which it is appropriate to deal with at that time, or which became evident after the date of issue.
- To require the adoption of the best practical option to remove or reduce any effects on the environment.
- To modify any monitoring programme, or to require specific monitoring if the record of monitoring indicates that any current monitoring requirements are inappropriate.
- To incorporate conditions restricting the discharge of material based on findings from monitoring of the Heretaunga Plains river systems.

REASONS FOR DECISION

1. The material to be discharged has minimal concentrations of heavy metals. All except two sites sampled have heavy metal concentrations below the Canadian Environmental Quality for Guidelines for Agriculture and Soil.

2. Leaching of heavy metals to groundwater is unlikely given the low concentrations of heavy metals present in the sediment.

3. The material is to be deposited away from surface water bodies.

4. Any offensive or objectionable odours from the material will go undetected.

5. The activity is consistent with relevant plans or policies and is consistent with the purpose and principles of the Resource Management Act 1991.

MONITORING NOTE

Routine monitoring

Routine monitoring inspections will be undertaken by Council officers at a frequency of no more than once every year to check compliance with the conditions of the consent. The costs of **any** routine monitoring will be charged to the consent holder in accordance with the Council's annual plan of the time.

Non-Routine monitoring

"Non routine" monitoring will be undertaken if there is reason to believe (eg. following a complaint from the public, or routine monitoring) that the consent holder is in breach of the conditions of this consent. The cost of non-routine monitoring will be charged to the consent holder in the event that non-compliance with conditions is determined, or if the Consent holder is deemed not to be fulfilling the obligations specified in section 17(1) of the Resource Management Act 1991 (RMA) shown below.

Section 17(1) of the RMA 1991 states:

Every person has a duty to avoid, remedy, or mitigate any adverse effect on the environment arising from an activity carried on, by or on behalf of that person, whether or not the activity is in accordance with a rule in a plan, a resource consent, section 10, section 10A, or section 20.

Consent Impact Monitoring

In accordance with section 36 of the RMA (which includes the requirement to consult with the consent holder) the Council may levy additional charges for the cost of monitoring the environmental effects of this consent, either in isolation or in combination with other nearby consents. Any such charge would generally be set through the annual plan process.

HAWKE'S BAY
REGIONAL COUNCIL

TRANSFER OF RESOURCE CONSENT: WP060035T

DATE: 12th January 2011

TO: **Indevin Estates Gisborne Limited**
PO Box 164
Blenheim 7240

FROM: New Zealand Breweries Limited

LOCATION: 38 Sissons Road, Pakowhai

LEGAL DESCRIPTION: Site of take: Lots 1 & 2 DP15447 & Lot 2 DP 28433
Site of use: Lot 1 & 2 DP 15447, Lots 1 & 2 DP 16826 & Lot 2 DP 28433

Tim Waugh
Consents Advisor
RESOURCE MANAGEMENT GROUP

HAWKE'S BAY
REGIONAL COUNCIL

TRANSFER OF RESOURCE CONSENT: WP060035T

DATE: 11th January 2011

TO: **New Zealand Breweries Limited**
111 Carlton Road
Newmarket 1023

FROM: Pernod Ricard New Zealand Limited

LOCATION: 38 Sissons Road, Pakowhai

LEGAL DESCRIPTION: Site of take: Lots 1 & 2 DP15447 & Lot 2 DP 28433
Site of use: Lot 1 & 2 DP 15447, Lots 1 & 2 DP 16826 & Lot 2 DP 28433

Tim Waugh
Consents Advisor
RESOURCE MANAGEMENT GROUP

HAWKE'S BAY
REGIONAL COUNCIL

RESOURCE CONSENT
Water Permit

In accordance with the provisions of the Resource Management Act 1991, and subject to the attached conditions, the Hawke's Bay Regional Council (the Council) grants a resource consent for a discretionary activity to:

Indevin Estates Gisborne Limited
PO Box 164
Blenheim 7240

to take water from well no. 1450, no. 1489, no. 15284 (100 mm diameter), and well no. 15282 and no. 15283 (75 mm diameter, coupled) to irrigate part of 90 hectares of viticulture within the area shaded on the site map below.

LOCATION

Address of site
38 Sissons Road, Pakowhai

Legal description
Site of take: Lots 1 & 2 DP 15447 and Lot 2 DP 28433
Site of use: Lot 1 & 2 DP 15447, Lots 1 & 2 DP 16826, Lot 2 DP 28433

Map reference
Well 1450: 2844366 6174135
Well 1489: 2844135 6173834
Well 15284: 2843770 6173338
Well 15282: 2843623 6173036
Well 15283: 2843577 6173049

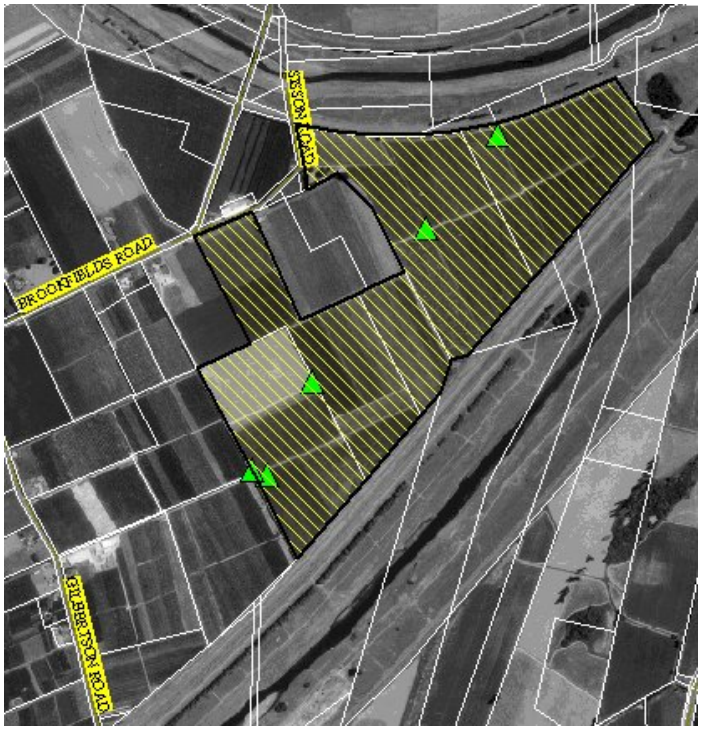
CONSENT DURATION

This consent is granted for a period expiring on 31 May 2026.

LAPSING OF CONSENT

This consent shall lapse in accordance with s.125 on 31 May 2011 if it is not exercised before that date.

Site Map



Colin McLellan
Team Leader Consents
ENVIRONMENTAL MANAGEMENT GROUP
Under authority delegated by Hawke's Bay Regional Council
30 June 2006

CONDITIONS

1. The rate of taking shall not exceed **60 litres per second**.

2. The volume taken shall not exceed that required to replace soil moisture depleted by evapotranspiration over the irrigated area, up to a maximum of **12000 cubic metres in any 7-day period** (i.e. at the maximum rate authorised in condition 1, taking should normally be less than, and never exceed 55.56 hours per week).

3. Each well from which water is authorised to be taken pursuant to this consent shall have a water measuring device installed before 1 September 2009. Each water measuring device shall be maintained to measure the volume of water taken to an accuracy of +/- 5%. The device shall be installed at the point of take and in accordance with the manufacturer's specifications.

   If any type of water measuring device other than a water meter is to be installed, the consent holder shall demonstrate to the Council (Manager Regulation), prior to installation, that the device will meet the required accuracy criteria once installed and at all times when water is being taken.

4. For the purpose of testing the accuracy of a water measuring device using a portable flow meter, all water taken shall pass through a straight length of pipe immediately before or after the device. The length of the pipe shall be no shorter than the equivalent of 15 times the pipe diameter. (See advice note.)

5. From 1 September 2009 each water measuring device shall be read at 7-day intervals beginning on 1 October and ending no earlier than 30 April the following year. Not more than 7 days after the end of each month, or at a longer interval as may be agreed with the Council's Manager Regulation, the consent holder shall provide the Council with a record of:

   a) the meter reading (in cubic metres)

   b) the volume of water taken each 7-day period (in cubic metres)

   c) the date and time of each reading

   d) the well number that the record relates to (if this consent authorises taking from multiple wells).

   Note: Records are required to be returned even if no water has been taken. See advice notes.

6. No water shall be taken during "no take" periods specified by the Council for the purpose of obtaining accurate hydrological measurements, provided that:

   a) the "no take" period specified by the Council is of no longer than twenty four (24) hours duration

   b) the Council gives at least 7 days notice to the consent holder of the time of the "no take" period, and

   c) consecutive "no take" periods are separated by an interval of at least 14 days.

Review of Consent Conditions by the Council

The Council may review conditions of this consent pursuant to sections 128, 129, 130, 131 and132 of the Resource Management Act 1991. The actual and reasonable costs of any review undertaken will be charged to the consent holder, in accordance with s.36(1) of the Resource Management Act.

Times of service of notice of any review: During the month of May 2008, 2010, 2012, 2016 and 2021.

Purposes of review:

To deal with any adverse effect on the environment which may arise from the exercise of this consent, which it is appropriate to deal with at that time or which became evident after the date of issue.

To modify any monitoring programme, or to require additional monitoring if there is evidence that current monitoring requirements are inappropriate or inadequate.

To ensure that the volume of water authorised by the consent is consistent with actual water needs.

To require, if necessary, the installation of a backflow prevention device to ensure that no contaminant can enter the aquifer through the bore.

Reasons for Decision

The reasons for granting the consent, including the plans, policies and any other statutory provisions that were considered, are in the application report enclosed with this document. Specific reasons for each condition of this consent are set out in Appendix 1.

Advice Notes

Water meter installation

1. Fittings required on well headworks such as water meters and backflow preventers require straight lengths of pipe either side in order to function properly. Please refer to the manufacturer's specifications for the specific dimensions necessary for each device before any modifications are made to well headworks.

2. The required length of pipe for compliance testing of water meter accuracy should, preferably, be above ground and located immediately 'upstream' of the water meter. If this is not practical, the length of pipe could be located below ground immediately 'downstream' of the water meter and other fittings. The consent holder will be required to excavate a hole around the pipe on receiving notice of the compliance testing.

Water take records

3. Where no water is taken over a long period (say more than 3 months) the Manager Regulation may authorise that records be provided at intervals exceeding one month.

Wellhead construction

4. To minimise the risk of contaminants entering groundwater, well headworks are required to be constructed to ensure that there are no openings through which contaminants might enter

the well. This would include ensuring that there are no gaps around pipework and cables at the wellhead.

Monitoring Note

Routine monitoring

Routine monitoring inspections will be undertaken by Council officers at a frequency of no more than once every year to check compliance with the conditions of the consent. The costs of **any** routine monitoring will be charged to the consent holder in accordance with the Council's Annual Plan of the time.

Non-routine monitoring

"Non routine" monitoring will be undertaken if there is cause to consider (e.g. following a complaint from the public, or routine monitoring) that the consent holder is in breach of the conditions of this consent. The cost of non-routine monitoring will be charged to the consent holder in the event that non-compliance with conditions is determined, or if the consent holder is deemed not to be fulfilling the obligations specified in section 17(1) of the Resource Management Act 1991 (RMA) shown below.

Section 17(1) of the RMA 1991 states:

> *Every person has a duty to avoid, remedy, or mitigate any adverse effect on the environment arising from an activity carried on, by or on behalf of that person, whether or not the activity is in accordance with a rule in a plan, a resource consent, section 10, section 10A, or section 20.*

Consent Impact Monitoring

In accordance with section 36 of the RMA (which includes the requirement to consult with the consent holder) the Council may levy additional charges for the cost of monitoring the environmental effects of this consent, either in isolation or in combination with other nearby consents. Any such charge would generally be set through the Council's Annual Plan process.

Debt Recovery

It is agreed by the consent holder that it is a term of the granting of this resource consent that all costs incurred by the Hawke's Bay Regional Council for, and incidental to, the collection of any debt relating to the monitoring of this resource consent shall be borne by the consent holder as a debt due to the Council, and for that purpose the Council reserves the right to produce this document in support of any claim for recovery.

Consent History

Consent No. (Version)	Date	Event	Relevant Rule Number	Relevant Rule Plan
WP060035T	30 June 2006	Consent granted	8-5	Regional Water Resources Plan (December 2000)
			55	Proposed Regional Resource Management Plan as at December 2005

APPENDIX 1: CONSENT CONDITION ANALYSIS

Condition No.	Condition title	Determination of Compliance	Reasons for condition	Reason for Limit
1.	Maximum rate	Water measuring device. If no WMD is required - portable flow meter or judgements based on observations such as environmental effects and pump size.	Ensures the scale of the activity, and therefore its potential effects, are limited to that applied for and/or assessed when the application was determined.	As applied for and reasonable.
2.	Maximum volume	As for condition 1. Also judgements based on pumping duration and irrigated area.	Encourages efficient use of water. Reasonable requirement based on factors such as climatic conditions and crop type. Policy 32 PRRMP.	Based on irrigated area.
3.	Water measuring device.	Inspection by Council officers. Condition 5.	To ensure compliance with conditions. Policy 30 PRRMP.	3 years for installation established by regional plan.
4.	WMD installation	Inspection by Council officers.	To ensure the water measuring device is measuring to the required 5% accuracy, the ability to test with a portable flow meter if necessary. Installation as described in the condition is necessary to enable a portable flow meter to be used.	N/A
5.	WMD records	Check of information provided by consent holder. Occasional reading of WMD by Council officer.	To ensure that volumes of water taken are recorded and provided to the Council. To assist in determining compliance with condition 2.	Daily readings would be required to determine compliance with condition 2 but a 7-day interval gives a good indication and is significantly less onerous in terms of data collection and management. Monthly returns (including the requirement for 'nil returns') are necessary to ensure any non-compliance (e.g. resulting from a faulty meter) is recognised without significant delay.
6.	No take period	Inspection by Council officers.	Occasionally (but seldom) it is necessary to obtain measurements such as groundwater levels at times when no taking is occurring in order to better understand the groundwater resource.	24 hours: allows time for the resource to recover following shutdown and for measurements to be taken. 7 days: gives consent holder sufficient time to plan for 24 hrs without irrigating. 14 days: not reasonable to have more than 2 days in a fortnight without irrigation.