

Karioi Wood Processing

Remedial Action Plan

for: Winstone Pulp International Limited



Job No: 68095

Version: Rev1

eTrack No: 200051337

Date of Issue: 24/04/2026

ACKNOWLEDGEMENT OF SUBMISSION

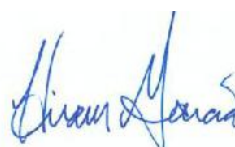
This report was prepared by Charlotte Lucas and reviewed by Hiram Garcia.

Respectfully submitted

Babbage Consultants Ltd



Charlotte Lucas
Environmental Consultant



Hiram Garcia
Principal Environmental Consultant

I have assessed the site in accordance with current New Zealand Regulations and guidance documents and reported in accordance with the current edition of Contaminated Land Management Guidelines No 1: Reporting of Contaminated Sites in New Zealand.

I am considered by Babbage Consultants Limited as a suitably qualified and experienced practitioner (SQEP) pursuant to the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011, based on the company's definition of a SQEP as given below.

Name: Hiram Garcia

Signed:



Date: 24 April 2026

Babbage Consultants Limited: SQEP Definition

Babbage Consultants Limited requires that a SQEP has the following Qualifications/Experience:

- Tertiary education in environmental science, engineering, or other relevant field;
- Ten years of relevant post graduate environmental experience;
- A commitment to continuing professional development; and
- Full membership of an appropriate professional body requiring a commitment to operating in accordance with a professional code of ethics.

Date	Version	eTrack No.	Author(s)	Reviewer(s)
24/04/2026	Rev1	200051337	Charlotte Lucas	Hiram Garcia

Remedial Action Plan

Site: Karioi Pulp Mill

This Remedial Action Plan (RAP) has been prepared by Babbage Consultants Limited (Babbage) for the earthworks activity to construct the proposed wetland to be located in the southern portion of the Karioi Wood Processing site (the site), 1002 State Highway 49 as shown on Figure 1 forming part of the resource consent application APP-2006012018.02.

The DSI findings have recommended the preparation of a Remediation Action Plan for the earthworks proposed specifically within the proposed wetland area (referred to as the “investigation area” within the DSI and within this RAP). The investigation area will undergo earthworks for the construction of a new wetland.. This RAP documents the proposed remediation goal, remediation method(s), and method to demonstrate achievement of the remediation goal(s).

This RAP must be read in conjunction with the Detailed Site Investigation Report – Karioi Wood Processing¹.

This RAP meets the requirements outlined in the Ministry for the Environment (MfE) Contaminated Land Management Guideline (CLMG) No. 1².

This RAP was prepared under the direction of a suitably qualified and experienced practitioner (SQEP) – as defined by the requirements of the National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health (NESC) Users Guide³.

Item	Description
Site description	The site is located north of State Highway 49 in Tangiwai. This RAP applies specifically to the investigation area shown in Figure 1, which consists of 1.84 ha of land proposed to be earth worked for the purposes of constructing a wetland. The investigation area consists of the existing pond and the surrounding grassed area as shown in Figure 1 below.

¹ Babbage 2026. Karioi Pulp Mill - Detailed Site Investigation Report by Babbage Consultants Limited, dated 20 April 2026.

² MfE 2021. Contaminated Land Management Guidelines No. 1. Reporting on Contaminated Sites in New Zealand (Revised 2021).

³ Ministry for the Environment “Users’ Guide National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health”, 2012 (MfE).

Item	Description
Scope and purpose of remediation	<u>Summary of contamination</u> Soil sample analyses reported only zinc at concentrations above the Soil Guideline Values for the Protection of Ecological Receptors (ECO-SGVs)⁴ commercial/industrial criteria at sample location WA18 at 1.5 metres (m) below the bottom of the pond. The nearest sample location collected at 1.5 m below the bottom of the pond identified zinc concentrations in soil below the ECO-SGV. See Appendix A for soil sample results table and sampling location plan. <u>Remediation strategy</u> Available remedial options are removal through excavation, capping to isolate contaminants from receptors, or leave in place which will require a site-specific risk assessment. The proposed remediation for the piece of land is capping to isolate contaminants from receptors. <i>Remediation method - In situ capping</i> The existing pond area where soil sample location WA18 is located will have a 2 to 3m thick cap of material placed on top to isolate contaminants from receptors. The bottom of the pond is approximately 1.5m deep and the zinc ECO-SGV exceedance was identified approximately 1.5m below the pond bottom, therefore at approximately 3m deep with respect to surrounding grassed area.
Remediation method(s)	Proposed remedial method <i>Remediation method - In situ capping</i> Location WA18 is situated within an existing pond which, according to the Cut and Fill plan outlined in Cheal's drawings (Appendix B), is proposed to be filled. This will result in approximately 3 m of cap material above the zinc ECO-SGV exceedance identified at 1.5 m below the bottom of the pond. The new wetland will be constructed on top the existing pond once it is infilled with cut material from surrounding area as shown in Figure 1. The new wetland will consist of an earth berm and be lined with an impermeable layer (e.g. PVC or compacted clay) to prevent water introduced to the wetland from infiltrating downward into the former pond area. A concept cross-section for the proposed wetland is presented in Appendix B.

⁴ Landcare Research, 2019. Development of soil guideline values for the protection of ecological receptors, June 2019

Item	Description
	<u>Proposed timing of remediation</u> The remediation will occur once a contractor has been assigned to the site. It is anticipated that the remediation of soils will be less than two months from commencement of earthworks. <u>Proposed remediation mitigation methods/controls</u> The following mitigation methods/controls shall be implemented by the earthwork contractor prior to/during the remedial works on site. <i>Excavation and disposal</i> Babbage understands that excavated material will be reused onsite, and therefore no off site disposal will be required. If temporary stockpiling of soils is required as part of general earthworks in the investigation area, the stockpiles must be covered with tarpaulins or similar impervious cover. <i>Erosion, sediment, and dust control</i> Refer to Cheal's Wetland Construction- Erosion and Sediment Control Plan⁵. <i>Worker hygiene</i> Workers must follow standard health and safety requirements and adhere to strict hygiene procedures, including no eating, drinking, or smoking in the area where excavation works are being undertaken. These activities must take place away from work areas. Soap and water shall be used for washing hands thoroughly prior to food consumption. <u>Proposed contamination management measures</u> The contractor will monitor dust generation during remedial works. Excess soil on plant and equipment should be removed in accordance with the contractors methodology prior to leaving site. <u>Proposed remedial activity record keeping</u> The required record keeping includes but is not limited to:

⁵ Cheal, 2026. Wetland Construction- Erosion and Sediment Control Plan, 9 April 2026.

Item	Description
	- Contractor will provide a statement to WPI's Project Manager that the placement of infilling of the existing pond and construction of the new wetland with the impermeable layer (e.g. PVC or compacted clay) has met the RAP. - Email digital photographs of the work to WPI Project Manager. <u>Photographs must be of the infilling of the existing pond and placement of the impermeable layer on the new wetland.</u>
Standard of remediation	<u>Proposed standard of remediation on completion</u> The following will be used to determine remediation is completed: Infilling of the existing pond and impermeable layer installed on the new wetland to prevent water introduced to the wetland from infiltrating downward into the former pond area.
Soil validation	<u>Proposed site validation</u> Photos provided showing the infilling of the existing pond and installation of the impermeable layer on the new wetland.
Unexpected contamination discovery protocols	If, during soil disturbance activities, the contractor encounters any visually stained or odorous soil, asbestos containing material (ACM), rubbish/building debris or other materials that appear to be contaminated, they shall stop work within that area and advise Babbage who will then visit the site to determine the nature and extent of the potentially contaminated soil. This is likely to include the collection of soil samples and laboratory analysis, followed by disposal off site to a disposal facility consented to accept the level of contamination identified on site. Subject to the approval of Babbage, the affected material may be temporarily stockpiled as above, while waiting for the laboratory results. Work shall not recommence within this area unless authorised by Babbage.

This document is not intended to relieve the person conducting a business or undertaking (PCBU, previously referred to as the controller of the place of work) of either their responsibility for the health and safety of their workers, contractors and the public, or their responsibility for protection of the environment. Persons undertaking ground disturbance works on the site should develop a site-specific risk assessment (such as a job safety analysis (JSA), or similar) to complement this RAP and to address other health and safety requirements that may be applicable to their particular works. The site-specific risk assessment should also be modified to address specific health, safety or environmental issues that may arise during the works.



Legend

- Site boundary
- New Wetland ('investigation area')
- Material to be re-used in investigation area
- Existing pond to be infilled re-used material
- Wetland sampling points

NOTES

Aerial Images: LINZ Basemap

DISCLAIMER:

This map/plan is not an engineering draft.
This map/plan is illustrative only and all information should be independently verified on site before taking any action.

SCALE

1:1,000 @ A3

MAP NO.

Figure 1

Appendix A Soil Sample Results Table and Sampling Location Plan



Legend

- Site boundary
- New wetland area
(‘investigation area’)
- Wetland sampling points

NOTES

Aerial Images: LINZ Basemap

DISCLAIMER:

This map/plan is not an engineering draft.
This map/plan is illustrative only and
all information should be
independently verified on site before
taking any action.

SCALE

1:2,000 @ A3

MAP NO.

Figure 2

Table 6: Soil analytical results - metals and other elements, asbestos, general chemistry

					Asbestos ¹	Metals and other elements- Screen														General Chemistry				SPLP
					Asbestos Containing Material (ACM) (Presence / absence and type)	Arsenic	Cadmium	Chloride	Chromium	Copper	Cyanide	Iron	Lead	Manganese	Mercury	Nickel	Phosphorus	Sodium	Zinc	pH	Ammoniacal Nitrogen	Nitrate Nitrogen	Sulphate-sulfur	Zinc (pH 4.2)
					-	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	mg N/kg	mg N/kg	mg/kg	mg/L
NESCS SCS Soil - Commercial / Industrial ²					N/A	70	1,300	N/A	>10,000	>10,000	1600 ⁶	N/A	3,300	N/A	4,200	6,000 ^{5D}	N/A	N/A	400,000 ^{5D}	N/A	N/A	N/A	N/A	N/A
ECO-SGVs - Commercial/ Industrial ³					N/A	150	33	N/A	650	320	N/A	N/A	2,500	N/A	N/A	N/A	N/A	N/A	620	N/A	N/A	N/A	N/A	N/A
Predicted Background Soil Concentrations ⁴					NAD	4.1	0.35	N/A	15.5	23.5	N/A	9,149-68,875 ⁸	11.4	74-1,295 ⁸	N/A	9.5	114-1,823 ⁸	80-2,503 ⁸	62.9	5.5-5.7 ⁷	N/A	N/A	N/A	N/A
ANZG - Fresh Water (Level of Protection 80%) ⁹					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.03
Waste Acceptance Criteria - Cleanfill (Envirofill South) ¹⁰					N/A	12	0.65	N/A	125	90	N/A	N/A	65	N/A	0.45	320	N/A	N/A	1,160	N/A	N/A	N/A	N/A	N/A
Waste Acceptance Criteria - Managed fill (Ridge Road Quarry) ¹⁰					Presence	140	7.5	N/A	400	280	N/A	N/A	460	N/A	N/A	320	N/A	N/A	1,200	N/A	N/A	N/A	N/A	N/A
Waste Acceptance Criteria - Hampton Downs landfill ¹⁰					Accepted	100	1.2	N/A	362	200	N/A	N/A	200	N/A	N/A	320	N/A	N/A	500	N/A	N/A	N/A	N/A	N/A
Property Address	Sample ID	Sample depth (m bgl)	Material Type	Sampled Date																				
WPI Wetland	WA01	0.1	FILL	30/03/2026	-	2.05	0.27	34	39.2	44.1	<5	7,530	7.6	60.8	<0.1	7.7	949	617	51	5.5	7	24	26	-
	WA02	0.1	FILL	30/03/2026	-	2.47	0.24	35	14.4	63.1	<5	6,130	6.3	23.5	<0.1	4.4	1,300	475	44	4.2	6	1	54	-
	WA03	0.1	FILL	30/03/2026	-	1.76	0.05	59	65	27	<5	18,300	5.2	254	0.2	13.4	377	791	94	5.5	2	1	7	-
	WA04	0.1	FILL	30/03/2026	NO ASBESTOS DETECTED	1.76	0.36	89	45.6	35.9	<5	6,330	4.8	46.8	<0.1	7.1	930	589	93	4.6	6	8	81	-
	WA05	0.1	FILL	30/03/2026	-	0.94	0.58	76	11	47.5	<5	2,480	2.7	26.3	<0.1	3.1	346	228	189	4.4	4	3	26	-
	WA06	0.1	FILL	30/03/2026	-	1.41	0.4	96	17.5	46.7	<5	5,000	3.5	41.4	<0.1	4.9	838	304	107	4.2	9	7	36	-
	WA07	0.1	FILL	30/03/2026	-	1.98	0.32	34	28	57.3	<5	11,200	7.5	55.5	<0.1	8.1	1,120	593	122	4.6	179	1	5	-
	WA08	0.1	FILL	30/03/2026	-	1.35	0.26	62	15	29.7	<5	6,130	18.1	60.8	<0.1	5	770	680	68	4.7	10	11	148	-
	WA09	0.1	FILL	30/03/2026	-	135	0.19	61	175	104	<5	4,790	29.9	61.8	<0.1	6	615	397	151	4.9	12	4	200	-
	WA10	0.1	FILL	31/03/2026	-	2.81	0.49	77	51	54.3	<5	6,380	5.8	110	<0.1	25.5	1,240	573	139	4.8	9	4	54	-
	WA11	0.1	FILL	31/03/2026	-	1.26	0.25	64	14.3	35.1	<5	7,400	3.8	141	<0.1	5.8	613	422	75	5.1	5	3	46	-
	WA12	0.1	FILL	31/03/2026	-	1.53	0.53	37	18.6	55.9	<5	4,500	3.3	80.4	<0.1	6.1	589	528	173	4.9	9	3	28	-
	WA13	0.1	FILL	31/03/2026	NO ASBESTOS DETECTED	2.2	0.15	47	15.2	39.3	<5	18,200	6.3	228	<0.1	9.3	377	727	100	5.1	5	16	23	-
	WA14	0.1	FILL	31/03/2026	-	1.88	0.04	57	20.1	40.8	<5	23,900	5.7	214	<0.1	10.4	190	621	34	5.9	4	1	12	-
	WA15	0.1	Pond sludge	31/03/2026	-	1.3	0.23	40	19.1	52.3	<5	24,400	5.6	127	<0.1	12.2	681	4,280	116	9.3	239	5	84	-
	WA16	0.1	Pond sludge	31/03/2026	-	1.26	0.28	61	11.2	29	<5	11,500	5.1	121	<0.1	6.8	518	1,390	105	8.1	284	1	124	-
	WA17	0.1	Pond sludge	31/03/2026	-	1.22	1.38	-	17.3	71.2	<5	1,720	3.4	44.4	<0.1	6.8	958	2,430	416	7.6	265	8	35	-
	WA18	0.1	Pond sludge	31/03/2026	-	1.51	1.46	-	18.4	81.2	<5	5,370	4.2	98	<0.1	9.6	1,310	4,920	418	7.5	369	9	40	-
	WA18	1.5	SILT	31/03/2026	-	6.45	4.12	19	112	194	<5	5,300	33.9	95.2	<0.1	38.2	409	2,380	1,340	7.1	308	3	126	2.19
	WA19	0.1	Pond sludge	31/03/2026	-	1.41	1.51	-	19.4	76.6	<5	1,970	3.9	51.7	<0.1	8.6	982	4,180	470	7.4	617	14	81	-
	WA20	0.1	Pond sludge	31/03/2026	-	1.44	1.66	-	61.6	84.3	<5	1,910	3.8	57.4	<0.1	32.4	1,210	4,920	482	7.8	398	7	33	-
	WA20	1.5	SILT	31/03/2026	-	2.87	0.1	136	31.1	64.6	<5	32,500	11.5	252	<0.1	17.1	1,620	4,080	61	8.9	309	1	147	-
	WA66 (Duplicate of WA08 0.1)	0.1	FILL	31/03/2026	-	1.46	0.34	-	18.7	31.5	-	-	16.3	-	<0.1	5.8	-	-	80	-	-	-	-	-
	WA67 (Duplicate of WA14 0.1)	0.1	FILL	31/03/2026	-	1.44	0.03	-	15.1	29.7	-	-	4.4	-	<0.1	7.4	-	-	24	-	-	-	-	-

Comments

Results are in milligrams per kilogram (mg/kg) or milligrams per litre (mg/L) unless specified.

1 = BRANZ, 2017. New Zealand Guidelines for Assessing and Managing Asbestos in Soil.

2 = MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health.

3 = Landcare Research, 2019. Development of soil guideline values for the protection of ecological receptors, June 2019

4 = Landcare Research, 2025. PCB- Predicted Background Soil Concentrations, New Zealand (H3 Resolution), 11 June 2025

5 = in the absence of available NESCS SCS Soil criterion for nickel and zinc, the criterion has been adopted from Assessment of Site Contamination National Environment Protection Measures (ASC NEPM) Toolbox – <http://www.nepc.gov.au/nepms/assessment-site-contamination/toolbox>. Health-based Investigation Levels (mg/kg) A=low density residential scenario, B=high density residential scenario, C=developed open space scenario, D=commercial/industrial scenario

6= A conservative value has been taken from MfE, August 1997. Guidelines for Assessing and Managing Contaminated Gasworks Sites in New Zealand, Residential criteria, Table 4.2.7.4 due to exceeding industrial/commercial values.

7= Landcare Research, June 2024. Soils Map Viewer. Retrieved from <https://soils-maps.landcareresearch.co.nz/>

8=GNS, 2023. Geochemical Atlas of Aotearoa New Zealand.

9=ANZG, 2023. Australian and New Zealand Guidelines for Fresh and Marine Water Quality

10 = Disposal criteria is based of analytica data and may vary. Verify with disposal facility prior to disposal.

N/A = Not Applicable.

<LoR - below laboratory reporting limits.

BOLD: exceeds background concentrations

BOLD : exceeds applicable NES:CS SCS criteria

BOLD : exceeds ECO-SGV soil acceptance criteria and ANZG water acceptance criteria

BOLD: exceeds applicable NES:CS SCS land use and ECO-SGV soil acceptance criteria

above Cleanfill expectionce criteria for Envirofill South

exceeds Managed Fill acceptance criteria for Ridge Road Quarry

exceeds Landfill acceptance criteria for Hampton Downs landfill

- : not tested for

m bgl: metre below ground level

Table 7: Soil analytical results - PCBs

					PCB - Screen																
					PCB 1	PCB 5	PCB 8	PCB 28	PCB 29	PCB 37	PCB 44	PCB 47	PCB 49	PCB 52	PCB 60	PCB 66	PCB 70	PCB 74	PCB 77	PCB 82	PCB 87
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NESCS SCS Soil - Commercial / Industrial ¹					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ECO-SGVs - Commercial/ Industrial ²					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Predicted Background Soil Concentrations ³					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Waste Acceptance Criteria - Cleanfill (Envirofill South) ⁵					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Waste Acceptance Criteria - Managed fill (Ridge Road Quarry) ⁵					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Waste Acceptance Criteria - Hampton Downs landfill ⁵					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Property Address	Sample ID	Sample depth (m bgl)	Material Type	Sampled Date																	
WPI Wetland	WA01	0.1	FILL	30/03/2026	<0.01	<0.06	<0.06	<0.02	<0.01	<0.02	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	WA02	0.1	FILL	30/03/2026	<0.01	<0.06	<0.06	<0.02	<0.01	<0.02	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	WA03	0.1	FILL	30/03/2026	<0.01	<0.06	<0.06	<0.02	<0.01	<0.02	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	WA04	0.1	FILL	30/03/2026	<0.01	<0.06	<0.06	<0.02	<0.01	<0.02	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Results are in milligrams per kilogram (mg/kg) unless specified.

1 = MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health.

2 = Landcare Research, 2019. Development of soil guideline values for the protection of ecological receptors, June 2019

3 = Landcare Research, 2025. PCB- Predicted Background Soil Concentrations, New Zealand (H3 Resolution), 11 June 2025

4 = NEPC, February 2014. NEMP Toolbox HIL D- Commercial/ Industrial. Retreieved from <https://www.nepc.gov.au/nepms/assessment-site-contamination/toolbox>

5 = Landfill and Managed Fill criteria may vary. Verify with accepting facility prior to disposal.

* Sum of PCBs calculated using lower toxicant equivalent (<LOR=0)

NA = Not Applicable.

<LoR - below laboratory reporting limits

BOLD:

BOLD :

BOLD :

BOLD:

- :

m bgl:

exceeds background concentrations

exceeds applicable NES:CS SCS criteria

exceeds ECO-SGV soil acceptance criteria

exceeds applicable NES:CS SCS land use and ECO-SGV soil acceptance criteria

above Cleanfill exceptance criteria for Envirofill South

exceeds Managed Fill acceptance criteria for Ridge Road Quarry

exceeds Landfill acceptance criteria for Hampton Downs landfill

not tested for

metre below ground level

Table 7: Soil analytical results - PCBs cont

					PCB- Screen																							
					PCB 98	PCB 99	PCB 101	PCB 105	PCB 114	PCB 118	PCB 126	PCB 128	PCB 138	PCB 153	PCB 154	PCB 156	PCB 158	PCB 166	PCB 169	PCB 170	PCB 171	PCB 179	PCB 180	PCB 183	PCB 187	PCB 189	PCB 201	Sum of PCBs *
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NESCS SCS Soil - Commercial / Industrial ¹					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7 ⁴	
ECO-SGVs - Commercial/ Industrial ²					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Predicted Background Soil Concentrations ³					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Auckland Background Concentrations (volcanic range) ³					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Waste Acceptance Criteria - Cleanfill (Envirofill South) ⁵					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Waste Acceptance Criteria - Managed fill (Ridge Road Quarry) ⁵					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Waste Acceptance Criteria - Hampton Downs landfill ⁵					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Property Address	Sample ID	Sample depth (m bgl)	Material Type	Sampled Date																								
WPI Wetland	WA01	0.1	FILL	30/03/2026	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.06		
	WA02	0.1	FILL	30/03/2026	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.06		
	WA03	0.1	FILL	30/03/2026	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.06		
	WA04	0.1	FILL	30/03/2026	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.06		

Results are in milligrams per kilogram (mg/kg) unless specified.

1 = MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health.

2 = Landcare Research, 2019. Development of soil guideline values for the protection of ecological receptors, June 2019

3 = Landcare Research, 2025. PCB- Predicted Background Soil Concentrations, New Zealand (H3 Resolution), 11 June 2025

4 = NEPC, February 2014. NEMP Toolbox HIL D- Commercial/ Industrial. Retrieved from <https://www.nepc.gov.au/nepms/assessment-site-contamination/toolbox>

5 = Landfill and Managed Fill criteria may vary. Verify with accepting facility prior to disposal.

* Sum of PCBs calculated using lower toxicant equivalent (<LOR=0)

NA = Not Applicable.

<LoR - below laboratory reporting limits

BOLD:

BOLD :

BOLD :

BOLD:

- :

m bgl:

exceeds background concentrations
exceeds applicable NES:CS SCS criteria
exceeds ECO-SGV soil acceptance criteria
exceeds applicable NES:CS SCS land use and ECO-SGV soil acceptance criteria
above Cleanfill expectionce criteria for Envirofill South
exceeds Managed Fill acceptance criteria for Ridge Road Quarry
exceeds Landfill acceptance criteria for Hampton Downs landfill
not tested for
metre below ground level

Table 8: Soil analytical results - OCPs[illegible]

Results are in milligrams per kilogram (mg/kg) unless specified.

1 = MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health.

2 = Landcare Research, 2019. Development of soil guideline values for the protection of ecological receptors, June 2019

3 = Landcare Research, 2025. PCB- Predicted Background Soil Concentrations, New Zealand (H3 Resolution), 11 June 2025

4 = Landfill and Managed Fill criteria may vary. Verify with accepting facility prior to disposal.

N/A = Not Applicable.

<LoR - below laboratory reporting limits

BOLD :	exceeds background concentrations
BOLD :	exceeds applicable NES:CS SCS criteria
BOLD :	exceeds ECO-SGV soil acceptance criteria
BOLD :	exceeds applicable NES:CS SCS land use and ECO-SGV soil acceptance criteria
	above Cleanfill acceptance criteria for Envirofill South
	exceeds Managed Fill acceptance criteria for Ridge Road Quarry
	exceeds Landfill acceptance criteria for Hampton Downs landfill
- :	not tested for
m bgl:	metre below ground level

Table 9: Soil analytical results - PAHs

					PAH - Screen														
					Acenaphthene	Acenaphthylene	Anthracene	Benzo[a]anthracene	Benzo[a]pyrene TEQ (lower bound)	Benzo[b+k]fluoranthene	Benzo[g,h,i]perylene	Chrysene	Dibenzo[a,h]anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NESCS SCS Soil - Commercial / Industrial ¹					N/A	N/A	N/A	refer BAPeq	35	refer BAPeq	N/A	refer BAPeq	refer BAPeq	refer BAPeq	N/A	refer BAPeq	210 ⁵	N/A	NA ⁵
ECO-SGVs - Commercial/ Industrial ²					N/A	N/A	N/A	refer BAPeq	47	refer BAPeq	N/A	refer BAPeq	refer BAPeq	190	N/A	refer BAPeq	N/A	N/A	N/A
Predicted Background Soil Concentrations ³					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Waste Acceptance Criteria - Cleanfill (Ridge Road Quarry) ⁴					N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A
Waste Acceptance Criteria - Managed fill (Ridge Road Quarry) ⁴					N/A	N/A	N/A	N/A	125	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Waste Acceptance Criteria - Hampton Downs landfill ⁴					N/A	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	200	N/A	N/A
Property Address	Sample ID	Sample depth (m bgl)	Material Type	Sampled Date															
WPI Wetland	WA01	0.1	FILL	30/04/2026	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	WA04	0.1	FILL	30/04/2026	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

Comments

Results are in milligrams per kilogram (mg/kg) unless specified.

1 = MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health.

2 = Landcare Research, 2019. Development of soil guideline values for the protection of ecological receptors, June 2019

3 = Landcare Research, 2025. PCB- Predicted Background Soil Concentrations, New Zealand (H3 Resolution), 11 June 2025

4 = Landfill and Managed Fill criteria may vary. Verify with accepting facility prior to disposal.

5 = in the absence of available NESCS SCS Soil criterion for Napthalene and Pyrene, the criterion has been adopted from MfE 1999. Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand, Revised 2011. Tier 1 Soil acceptance criteria for residential landuse, ALL PATHWAYS, SANDY

NA = Not Applicable.

<LoR - below laboratory reporting limits

- BOLD:

exceeds background concentrations
- BOLD :

exceeds applicable NES:CS SCS criteria
- BOLD :

exceeds ECO-SGV soil acceptance criteria
- BOLD:

exceeds applicable NES:CS SCS land use and ECO-SGV soil acceptance criteria
- above Cleanfill exceptance criteria for Envirofill South
- exceeds Managed Fill acceptance criteria for Ridge Road Quarry
- exceeds Landfill acceptance criteria for Hampton Downs landfill
- :

not tested for
- m bgl:

metre below ground level

Appendix B Wetland Drawings



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NOTES:

1. All work shall be done in accordance with NZS 4404:2010 Land Development and Subdivision Infrastructure.
2. Heights in terms of NZVD 2016
On site datum: M53
RL: 695.50
Coordinates: NZGD 2000
Circuit: Tuhirangi 2000
Contour Interval = 0.2m
3. Contractor to locate and identify existing utility location and depths prior to construction. The project engineer shall be informed of any discrepancies to the information depicted on these plans immediately for revised drawings.
4. Contractor shall install and maintain all stormwater, dust and erosion control during construction as per earthworks management plan and the Horizon Regional Council Erosion and Sediment Control - "Guidelines for soil disturbing activities".
5. All disturbed areas shall be re-topsoiled and grassed within 30 days upon completion of contract works.
Dust control shall be maintained until grassed areas have become established.

LEGENDS:

- Bottom of Wetland
- Top of Wetland Bund
- Toe of Wetland Bund

Rev	Date	Amendment	By	Chk	App
A	01/04/26	Issued For Client Review	AC	AT	SP

Project Title
Babbage Consultants Limited
1002 State Highway 49
Tangiwai, Ohakune

Drawing Title
Finished Contours Plan

Surveyed	-	-	-
Designed	A. Chand	01/04/26	AC
Drawn	A. Chand	01/04/26	AC
Checked	A. Thomas	01/04/26	AT
Approved	S. Prasad	01/04/26	SP

Status	REVIEW		
Scale	A1	1:500	A1
	A3	1:1000	
Drawing Number	260156-200		
		Rev	A

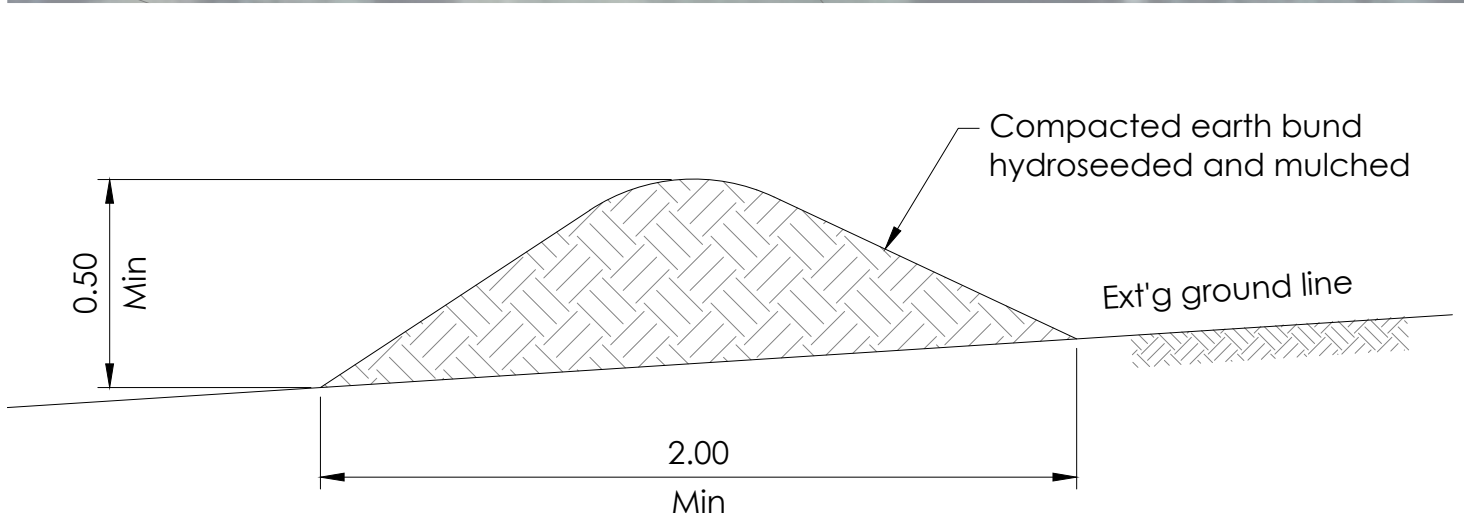


Erosion & Sediment Control Notes:

The earthworks within the wetland are proposed to be undertaken during a favourable weather window, with no rainfall forecast for the duration of the works.

Prior to the commencement of any activity within the area, a temporary perimeter bund will be installed around the site. This bund will act as a precautionary measure to contain any dirty water within the work area and to divert any clean surface water away from the site.

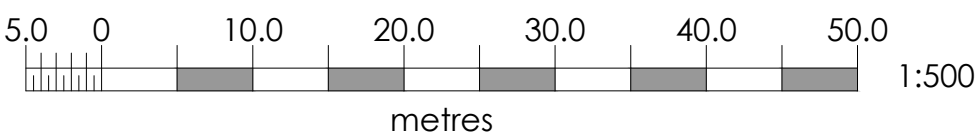
The temporary bund may be progressively removed in stages as the pond excavation is completed and once there is no longer a risk of dirty water leaving the work area.



Temporary Perimeter Bund
Scale: NTS

Volume Summary							
Name	Type	Cut Factor	Fill Factor	2d Area (m²)	Cut (m³)	Fill (m³)	Net (m³)
Cut & Fill Volume	Earthworks	1.00	1.500	17146.53	10447.47	9994.57	452.90 <Cut Excess>

Surface Elevation Data			
Color	Minimum Elevation	Maximum Elevation	Cut / Fill
Red	-2.21	-2.00	Cut
Light Red	-2.00	-1.50	Cut
Orange	-1.50	-1.00	Cut
Yellow	-1.00	-0.50	Cut
Light Green	-0.50	0.00	Cut
Green	0.00	0.50	Fill
Dark Green	0.50	1.00	Fill
Light Blue	1.00	1.50	Fill
Blue	1.50	2.00	Fill
Dark Blue	2.00	2.09	Fill



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NOTES:

- All work shall be done in accordance with NZS 4404:2010 Land Development and Subdivision Infrastructure.
- Heights in terms of NZVD 2016
On site datum: M53
RL: 695.50
Coordinates: NZGD 2000
Circuit: Tuhirangi 2000
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Dust control shall be maintained until grassed areas have become established.

Rev	Date	Amendment	By	Chk	App
A	01/04/26	Issued For Client Review	AC	AT	SP

Project Title
Babbage Consultants Limited
1002 State Highway 49
Tangiwai, Ohakune

Drawing Title
Cut & Fill and
Erosion & Sediment Control Plan

Surveyed	-	-	-
Designed	A. Chand	01/04/26	AC
Drawn	A. Chand	01/04/26	AC
Checked	A. Thomas	01/04/26	AT
Approved	S. Prasad	01/04/26	SP

Status	REVIEW		
Scale	A1 1:500	A1	
	A3 1:1000		
Drawing Number	260156-201		Rev A

Figure 3. Concept cross-section for the proposed constructed wetland system (not to scale).

