Boffa Miskell

DRAFT Kauri Dieback Management Plan

Muriwai Downs

Prepared for The Bears Home Project Management Limited

Document Quality Assurance

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Appendix 1

Construction management plan for works within KHAs.

1.0 Introduction

1.1 Project Overview

The Bears Home Project Management Limited, is applying for all necessary resource consents required to construct, operate and maintain an international, marquee standard 19-hole golf course and associated facilities. As part of the resource consent process, the Auckland Council has requested the provision of a Kauri Dieback Management Plan under section 92 of the RMA.

The proposed activity is to occur on Muriwai Downs Farm, approximately 30 km northwest of Auckland's city centre. The total land area is 506.6 ha across 8 allotments. Currently the property is managed as pastoral farmland. There are eight Significant Ecological Areas (SEAs) within the property including large native coastal kauri-broadleaf forest remnants within gullies, a large coastal wetland, and Lake Okaihau, along with smaller indigenous vegetation remnants, natural wetlands, and scattered mature native trees within pasture grassland. The restoration and enhancement of these features is part of the applicant's vision for the property to create the golf course and associated facilities.

For the purposes of this plan, "**Site"** means all land within the property to be used for the Project (as described in the AEE report).

1.2 Requirement for a KDMP

Kauri *(Agathis australis)* are present within forest remnants on the property, along with scattered individual trees on grass slopes near forest margins (Refer to MCCL Drawings 1976-1-190 to 192-Appendix A).

Kauri dieback is evident within the property. Specimens show a range of infection severity, from cursory signs through to dying or dead. Drip lines are estimated to be up to 20 m for the largest trees, and are on average 9.5 m.

Activities associated with the proposed development (as detailed in the AEE) that require management to limit the risk of exacerbating kauri dieback spread include:

- Topsoil removal, stockpiling and bulk earthworks over an area of approximately 99 ha involving approximately 590,000 m^3 of combined cut to fill. These works encroach within the dripline of kauri trees and require the removal of some specimens located in pasture areas (all of which show signs of dieback).
- Restoration and amenity planting will be undertaken as part of the Site's development, including buffer planting of areas within the dripline of kauri to limit access.
- Operation of the golf course will involve use of groundwater and surface water to irrigate the site, for maintenance activities, and in use of the site for commercial and recreational purposes.

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2.0 Kauri Dieback Disease Characteristics

Phytophthora agathidicida is the pathogen regarded as a primary causal agent of dieback disease in otherwise healthy kauri, while other *Phytophthora* species may also have a role in the expression and severity of disease symptoms. Kauri dieback infects trees through their roots, and spreads primarily through the movement of contaminated soil and water, as well as by root-to-root contact between trees (Bradshaw et al., 2020).

Previous surveillance work (Hill et al., 2017) has identified that kauri dieback infections are associated with tracks and watercourses, and human activity and disturbance is thought to be a key vector of the disease.

The kauri dieback pathogen has two types of propagule. The oocyte is formed within infected tissue and released into the soil where it can remain latent for an indefinite period. Soil movement is a key mode of dispersal of this type of propagule. The oocyte is resistant to SteriGENE® and other disinfectants.

Ultimately, the oospore germinates and produces zoospores which can 'swim' in water and move through micropores in saturated soil, and in this way actively disperse themselves. In this form, the pathogen finds and infects tree roots. The zoospores can be destroyed with disinfectant.

Sources and locations of kauri dieback pathogen are:

- Infected tree roots of kauri;
- Soil and waterbodies within infected catchments where oospores have been dispersed;
- Moist, porous soil layers where motile zoospores have emerged and dispersed.

Periods of soil saturation favour disease development, which may arise due to rainfall events or may be associated with irrigation, subsurface drainage, watercourses, ponding, or seeps. In general, wet conditions tend to increase movement of soil and debris and also provide better conditions for *Phytophthora* survival and infectivity, so the risk of effective transport is much higher under wet than dry conditions (Swiecki & Bernhardt, 2016).

Phytophthora distribution is typically non-uniform because these pathogens are normally associated with host roots (Swiecki & Bernhardt, 2016). Recent surveillance work has found that *P. agathadicida* can occur in soil away from the rhizosphere (root zone) of kauri (Biosense, 2020), though the frequency of detection was much higher near to kauri trees. This is likely to be because the pathogen primarily reproduces within the rhizosphere of kauri, and therefore concentrations of propagules are much greater there.

The likelihood of *Phytophthora* invasion increases with the number of viable spores that are introduced into the habitat. Key factors are the total volume of contaminated material that is moved and the density of *Phytophthora* propagules in this material (Swiecki & Bernhardt, 2016).

Mineral sub-soil layers below the root zones of vegetation are at lower risk of contamination relative to organic soil layers, as inorganic parts of the substrate are not porous and do not contain living plant material.

Ultra-violet radiation has proven effective in inactivating *Phytophthora* zoospores (Younis et al., 2019), while zoospore survival in waterbodies is relatively short-lived, i.e., up to 2 to 3 weeks, though there is variation between species and depending on factors such as temperature and pH (Kong et al., 2012).

3.0 Management Plan Approach

3.1 Objective

Extensive, severe decline of numerous kauri trees across a range of size classes and ages throughout the property are a strong indication that the pathogen *Phytophthora agathadicida* is present and levels of infection are high.

The purpose of this Management Plan is to minimise the risk of spreading kauri dieback disease within and beyond the Site throughout the development, and during the ongoing maintenance and use of the Site. The primary risk is off-site dissemination, as all kauri stands within the Site show obvious evidence of decline. Nevertheless, effective containment of works in close proximity to kauri where the pathogen load is likely to be high (the 'Kauri Hygiene Area' or KHA; Figure 1) will reduce the chances of contacting and spreading the pathogen in the course of routine activities.

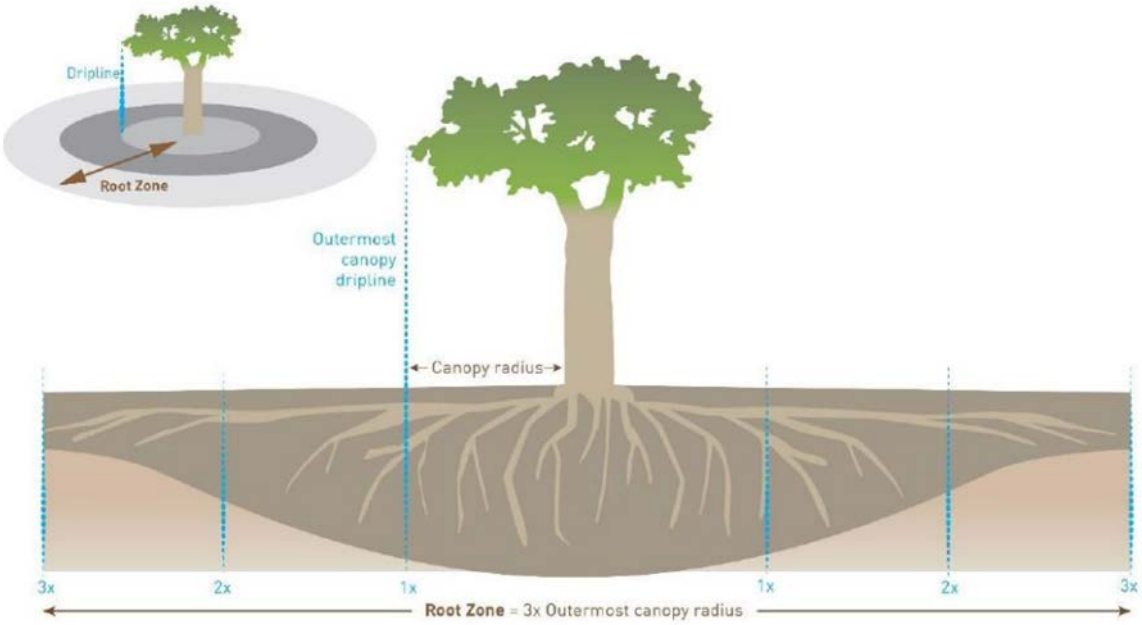

Figure 1. *Diagram showing the Kauri Hygiene Area, encompassing the indicative root zone of kauri (approximately 3 times the radius of the outermost canopy dripline)[1]. Kauri trees don't have a defined taproot (Bergin & Steward, 2004) and most of the roots occur near the soil surface. Anchoring 'peg' roots can extend to a depth of 5 m or more.*

Given the obvious and extensive infection present within the site, it is unlikely that the pathogen is confined to soil in the immediate vicinity of kauri. This KDMP employs a risk management approach that assumes propagule concentrations and the associated risk of contacting and spreading the disease are likely to be more severe in the immediate vicinity of kauri trees, and places more stringent controls on activities in these locations. Elsewhere on the site, the pathogen is likely to be patchily and sparsely present, and management primarily focuses on

[1] Figure sourced from https://www.kauridieback.co.nz/media/2018/bpg-quarry-hygiene_v14_final-signed2.pdf.

maintaining good hygiene practices to minimise the likelihood of dispersing the disease off the site.

3.2 Management Approach

Overseas experience in management of *Phytophthora* related dieback diseases (e.g., Colquhoun & Hardy 2000) demonstrates that effective disease management procedures can be achieved through recognising contamination risk pathways and following appropriate working practices that minimise the risk of spreading the pathogen. While activities including earthworks within KHAs cannot be avoided, the proposed approach is otherwise consistent with Auckland Council's own Kauri Hygiene Standard Operating Procedures (March 2021). Key risk management principles include:

- Knowing where the pathogen is present.
- Restricting movement of material from infested to uninfested areas.
- Practicing good hygiene measures following activity in infested areas.
- Preventing infested and uninfested soils mixing.
- Preventing water draining from infested to uninfested areas.
- Training all staff, including contractors and field staff, site supervisors and managers.
- Ensuring all people who access the site have an understanding that their individual efforts to limit the spread of kauri dieback are important.
- Monitoring to enable procedural improvements when there is evidence that the program is not effective.

Management of kauri dieback disease risk for this Site has the following components:

- Works specifications will minimise the risk that any potentially infected material is discharged or moved offsite in an uncontrolled manner. This includes measures to contain overland flows of stormwater, and soil disposal within the site, as appropriate for the level of infection risk.
- Containment and wash facilities and hygiene protocols to prevent site workers and machinery moving soil offsite and between work areas.
- Hygiene facilities and protocols for the ongoing maintenance and use of the Site.

3.3 Summary of Site Protocols

The spread or movement of Kauri Dieback primarily occurs through contaminated soil or surface water. Therefore, the applicable management functions are those that control and/or mitigate the movement of soil and surface water during construction and operation of the Site.

Containment measures to be actioned at each stage of works are as follows:

Prior to Site Works\General

- Washdown Facilities (Vehicle and Personnel) installed at Site exit.
- Training of all contractors and staff in KDB hygiene requirements at site induction.

- Physical delineation of earthworks boundary.
- Physical delineation of Kauri Hygiene Areas (KHA).
- Establishment of stabilised entry points and washdown facilities installed at KHA access points.

Topsoil Removal and Bulk Earthworks

- Routine maintenance of access points and wash down facilities. Wash water collected and contained onsite until it can be sterilised or disposed of.
- Control of runoff to avoid moving high-risk material to non-KHA sites; localised sediment controls installed prior to bulk earthworks with downstream surface water containment.
- Keep works in KHAs to a short duration and as far as possible during summer months.
- Disposal of all soil and organic material from within KHAs on-site, to be placed in specified disposal locations as shown on McKenzie and Co. Kauri Dieback Management Plans.

Operational phase

The Site Manager will responsible for overseeing implementation of Kauri Dieback management protocols.

- Strict hygiene protocols will apply during maintenance works within soil disposal site(s), ensuring all tools, clothes and footwear are cleaned or bagged for transport to a cleaning facility prior to moving out of the KHA.
- Strict hygiene protocols will apply during planting and maintenance works around isolated kauri trees and where kauri occur on the margins of forest remnants.
- Irrigation is to be regulated and monitored to avoid over-saturation of soils.

4.0 Detailed Specifications

4.1 Prior to Site Works

The following actions must be completed before any vegetation clearance, earthworks or heavy machinery movement occurs on the Site.

1. A wash facility for vehicles, machinery, equipment and footwear is established at a nominated single entry and exit point to the Site. Note that this does not have to be at the property entrance, as the focus is on machinery and gear that move in and around KHAs rather than street vehicles etc. The facility is to include a vehicle washdown with shaker ramp or approved equivalent to enable collection of all sediment and surface water from the wash down process. Wash water is to be collected and contained on-site until it can be sterilised or disposed of utilising a sucker truck.

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2. The wash facility for vehicles, machinery, equipment and footwear is to be used at each entry and exit of personnel, vehicles and machinery to the Site. No entry or exit to or from the Site will occur anywhere except through the designated access points.

3. All footwear, tools and equipment must be totally soil-free when entering and exiting the Site. Equipment (including footwear) should be cleaned and sprayed with SteriGENE® disinfectant (or equivalent) when departing the Site.

4. KHA encompassing at least 3 times the crown radius of all kauri trees (Figure 2) will be delineated. An arborist will determine and mark out the actual extent of the kauri root zone within each KHA, and the extent of the KHA will be extended if required to encompass all kauri roots plus an appropriate buffer zone. The contractor will identify in conjunction with the Ecologist, Arborist, Engineer and Council representative the required operational extent to undertake the works. This extent will then be temporary fenced initially to ensure no machinery or personnel enter unnecessarily.

5. Boot and equipment wash facilities are to be installed at entry point to all KHAs within the construction footprint.

4.2 Construction Phase

The bulk earthworks associated with the proposal will cover in excess of 50,000 m^2 of land of varying slopes, and consists of consists of approximately 590,000 m^3 of cut to fill activities over an area of approximately 99 ha.

4.2.1 Site-Wide Hygiene Specifications

The following controls will be implemented throughout the construction period.

- All soil is to be treated as potentially infected. No soil material is to leave the property.

- The wash facility for vehicles, machinery, equipment and footwear is to be used at each entry and exit of personnel, vehicles and machinery to the Site. No entry or exit to or from the t Site will occur anywhere except through the designated access points.

- All footwear, tools and equipment must be totally soil-free when entering and exiting the Site. Equipment (including footwear) should be cleaned and sprayed with SteriGENE® disinfectant (or equivalent).

- Earthworks are to be staged to limit the extent of open works. As far as possible, works are to be undertaken in dry weather to reduce soil adhering to vehicles and equipment.

- Any damage to silt fences will be remedied promptly.

- Wash water is to be collected and contained on-site until it can be sterilised or disposed of.

- Wash water cannot be re-used or recycled within the wash station unless sterilised.

- Drainage and storm water run-off from the Project Site is to be diverted away from KHAs.

4.2.2 KHA Specific Measures

A site plan showing details of earthworks and construction management within KHAs is provided in Appendix 1. The following additional specific controls will apply to Kauri Hygiene Areas:

1. Topsoil isolation bunds will be constructed around KHA. Construction and operational extents, construction machinery and topsoil are to be located/ sourced from outside of fenced areas.

2. Establish hardfill haul roads and parking areas for staff vehicles, refuelling, materials and cleaning facilities outside of KHA. Note refuelling can be completed without refuelling equipment needing to enter the KHA by plant positioning itself adjacent to the isolation bunds.

3. Once above works are completed, machinery required inside KHA will be established and will remain until completion of KHA works.

4. All works to be done with localised stormwater and sediment controls. During the process of topsoil removal, external catchment surface flows will be directed away from the works areas, while dirty water will be collected and treated for sediment at source within decanting earth bunds. Water will then be discharged from the containment facility to the receiving watercourse within the same catchment as the KHA.

5. Wash down of footwear and equipment used within a KHA shall occur within the KHA. Soil attached to machinery that has operated within a KHA must be removed prior to exiting the KHA, and cleaned in the wash-down facility prior to exiting the Site.

6. Topsoil and organic material from within KHAs must be re-buried within the KHAs (as shown on McKenzie and Co. Kauri Dieback Management Plans) beneath a layer of topsoil and oversown. No soil material resulting from the earthworks within KHAs is to be deposited outside of KHAs. In summary, steps to achieve this are as follows:

    i. Topsoil within KHA will be stripped and temporarily removed to stockpiles within KHA. Stockpiles are to be covered to prevent dust and erosion issues.

    ii. Once topsoil is stripped, cut to fill earthworks are to commence with initial shallow cuts of clay placed in base of fill areas[2]. Once shallow cuts are completed, deeper cuts are to continue to fill areas.

    iii. Cut or fill areas where revegetation is proposed are to be deepened by approximately 0.5 m to accommodate placement of stripped topsoil from KHA.

    iv. Once cut / fill works are completed, stockpiled KHA topsoil is to be respread within deepened revegetation sites and overlaid with a minimum 0.2 m of topsoil obtained from outside the KHA.

[2] With respect to gully filling, underfill drainage and the initial filling of the gully will be undertaken with clean material to ensure a seal is established before fill from the KHA is placed.

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v. Immediately following placement of topsoil, the area will be mulched and seeded to rapidly stabilise.

vi. Machinery can then be cleaned and leave the KHA.

vii. The protection bund can then be moved onto the completed works (to allow for changes in ground level on the margin between the KHA and general earthworks area.

viii. Once the KHA operations are complete bulk earthworks can commence in the surrounding area with the protection bund remaining in place and no machinery needing to enter this area.

4.3 Operational Phase

4.3.1 Irrigation

The proposal includes construction of a reservoir with a capacity of 140,000 m^3 to store surface water sourced from Raurataua / Ōkiritoto stream for use within the golf course and associated buildings for irrigation and potable supply. Parts of the stream catchment are forested and while these areas have not been surveyed, there is potential for infected kauri to be present in the headwaters.

The motile zoospores of *Phytophthora* are waterborne and can disperse via waterways, therefore there is potential to spread the pathogen via use of irrigated water. However, we note that the proposed water take will be during high flow events (i.e., primarily winter months) while irrigation will be undertaken during periods of low soil moisture (i.e., dry summer months). Therefore, the residence time of water in the reservoir will be in the order of several months, whereas motile zoospores are viable for a few weeks (Porter & Johnson 2004). Therefore, we consider that irrigation water proposed for use in this site poses a low risk of either increasing the extent of kauri dieback infection within the site, or likelihood of spreading it beyond the property.

We note that the irrigation systems proposed for this golf course will enable targeted application of water through the use of automation and moisture sensors. The irrigation system will be devised with water efficiency optimisation as the primary goal, so there is minimal risk of exacerbating spread of the pathogen through overwatering.

4.3.2 Works in Proximity to Kauri

- Due to the proximity of amenity and restoration plantings to diseased kauri, all maintenance works in the vicinity will follow protocols applied to KHAs. That is, footwear, clothing and equipment is to be cleaned of soil and sprayed with SteriGENE® at the work site, and cleaned in the wash-down facility prior to exiting the property.

4.4 Management of Diseased Kauri

Once *P. agathidicida* is in a forest, there are very few control options available for treatment of infected trees. Treatment trials with phosphite applied via trunk injection show some promise in

arresting or reversing symptoms of kauri dieback, though this is still considered experimental for treatment of kauri, and there are still unknowns regarding factors such as concentration, dose rates, the longevity of treatment, and appropriate doses for large trees or trees showing advanced decline. The mechanism of control is not known for kauri, but evidence suggests that it is predominantly through stimulation of host defences rather than fungicidal activity. We are investigating whether phosphite treatment has the potential to assist with the management of disease risk on the site, with a particular focus on treating trees occurring on forest margins and as individual specimens outside of bush areas.

5.0 Roles and Responsibilities

5.1 Site Manager

It is the Site Manager's responsibility to:

- Ensure all contractors, consultants and staff are informed of the relevant protocols included in this document;
- Ensure that contractors, consultants and staff understand that entry into and exit from the project site triggers kauri dieback control protocols;
- Undertake ongoing monitoring and repairs of the exclusion and silt fences, which will be installed as part of the site preparation;
- Carry out and document daily and 'inclement weather' inspections of sediment and runoff controls around the works site and remediate issues identified;
- Oversee contractors, consultants and staff to ensure compliance with the work protocols specified in this management plan.

5.2 Project Engineer

It is the Project Engineer's responsibility to:

- Review and assist the contractor in designing and maintaining compliant earthworks controls in accordance with the KDMP and consent conditions.
- Inspections the installed control measures to ensure compliance.
- Provide instruction and oversight to ensure adequate hold points are stipulated and observed so that the KDMP principles are achieved.

5.3 Project Arborist

It is the Project Arborist's responsibility to:

- Identify driplines and root zones of all kauri trees in the vicinity of the works footprint.
- Confirm final location and supervise installation of KHA fencing and signage;

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- Supervise earthworks within KHAs to ensure damage to the root zone of any kauri tree to be retained is avoided
- Advise as to the appropriate depth of excavation to ensure all organic topsoil and root material is excavated from KHAs to be stripped, and oversee the earthworks.

6.0 Communication

6.1 Training and induction

Ensuring all contractors, consultants and staff are aware of the potentially severe impacts of kauri dieback disease how it is spread, and effective prevention measures is key to promoting compliance with this Kauri Dieback Management Plan.

The Site Manager is to induct all contractors, consultants and staff upon their first entry to the site. The following points should be included in all site inductions:

1. The background of Kauri Dieback disease; the organism that causes it and how it infects kauri;
2. The fact that Kauri dieback is present on the site, and locations where it has been observed and potentially present on the site;
3. The impacts of Kauri Dieback Disease on kauri and the wider forest ecosystem;
4. How the disease is spread, noting that small fragments of contaminated soil can spread the disease;
5. That there is no known cure for Kauri Dieback Disease, and if *Phytophthora agathidicida* is introduced to an ecosystem it is not currently possible to eradicate it;
6. The hygiene procedures each contractor is required to undertake and how these procedures will help keep the work site and its surrounds free of kauri dieback.

Training in hygiene procedures will be undertaken as part of the induction process for new personnel when they enter the site. Training will emphasise individual and collective responsibility for making sure equipment is completely clean of soil, and step through site entry and exit procedures to ensure these are clear and unambiguous.

6.2 Signage

Signage will be placed around wash stations and the site office to reinforce the hygiene procedures outlined in the training.

All KHA will be appropriately marked with signage every alerting personnel to the KHA and required protocols.

7.0 Monitoring, Surveillance and Management

7.1 During Construction

7.1.1 Entry and exit from site

The Site Manager will be responsible for ensuring that all vehicles, equipment and machinery are being appropriately washed with SteriGENE® (or equivalent) upon entry into the Project Sites, and that wash stations are kept clean, maintained and in working order.

7.1.2 Sediment Controls

The Site manager is responsible for daily inspections to ensure the effectiveness of containment and erosion control measures (bunds, geotextile covers, wood chip, brush fascines, etc) implemented around both the active works area and treated areas during the process of topsoil stripping. A checklist of observations and accompanying site photographs will be compiled, including (but not limited to):

- conditions - wet/ dry/ dusty
- any bare soil exposed
- any flowing water observed
- integrity of fencing and other containment structures

The Site Manager is responsible for ensuring any issues identified are immediately remedied and documented with photographs.

7.1.3 Weather Events

Weather forecasts are to be closely monitored during site works to ensure the work site is adequately closed, covered and bunded during rainfall events. Bunds downslope of active works are to be inspected during any rain event in the course of vegetation clearance and topsoil removal, and immediately remedied if breaches are identified.

7.2 Post Construction

7.2.1 Hygiene facilities

A wash facility for vehicles, machinery, equipment and footwear is to be retained and kept operational at the entry/ exit for the resort/ golf course. The Site Manager is responsible for ensuring any vehicles, footwear and equipment used on the golf course or surrounding open space are inspected and cleaned before leaving the site (street wear and vehicles that access only formed roads/ hard stand areas will not require cleaning).

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7.2.2 Testing for *P. agathadicida*

A monitoring protocol is to be established for the hygiene facility at the site entry/ exit point from the commencement of construction works. The Site Manager is to undertake routine inspections of vehicles, machinery, shoes and equipment exiting the site and ensure these are free of soil.

Swabs collected from a representative sample of vehicles, shoes and equipment prior to and after cleaning are to be tested for the presence *of P. agathadicida* at three monthly intervals during the construction period to ensure hygiene protocols are adhered to and are effective. If more than incidental, one off detections of the pathogen occur following cleaning, protocols will be reviewed to increase efficacy and follow-up testing will be undertaken to ensure the matter is remedied.

Swabs collected from a representative sample of vehicles, shoes and equipment prior to and after cleaning are to be tested for the presence *of P. agathadicida* at six monthly intervals during the first three years of operation of the site to ensure hygiene protocols are adhered to and are effective. As above, detections of the pathogen will trigger a review of hygiene protocols and follow-up testing will be undertaken to confirm efficacy.

8.0 Management Plan Review

The understanding of kauri dieback and protocols for managing and preventing the spread of it are continually evolving to reflect the latest research and scientific information available. The above therefore represents a detailed approach based on the most recently available data and information. However, it is expected that this will be amended and updated in accordance with current best practice to manage the spread of kauri dieback disease.

9.0 References

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Appendix 1

Construction Management Plan for works within KHAs

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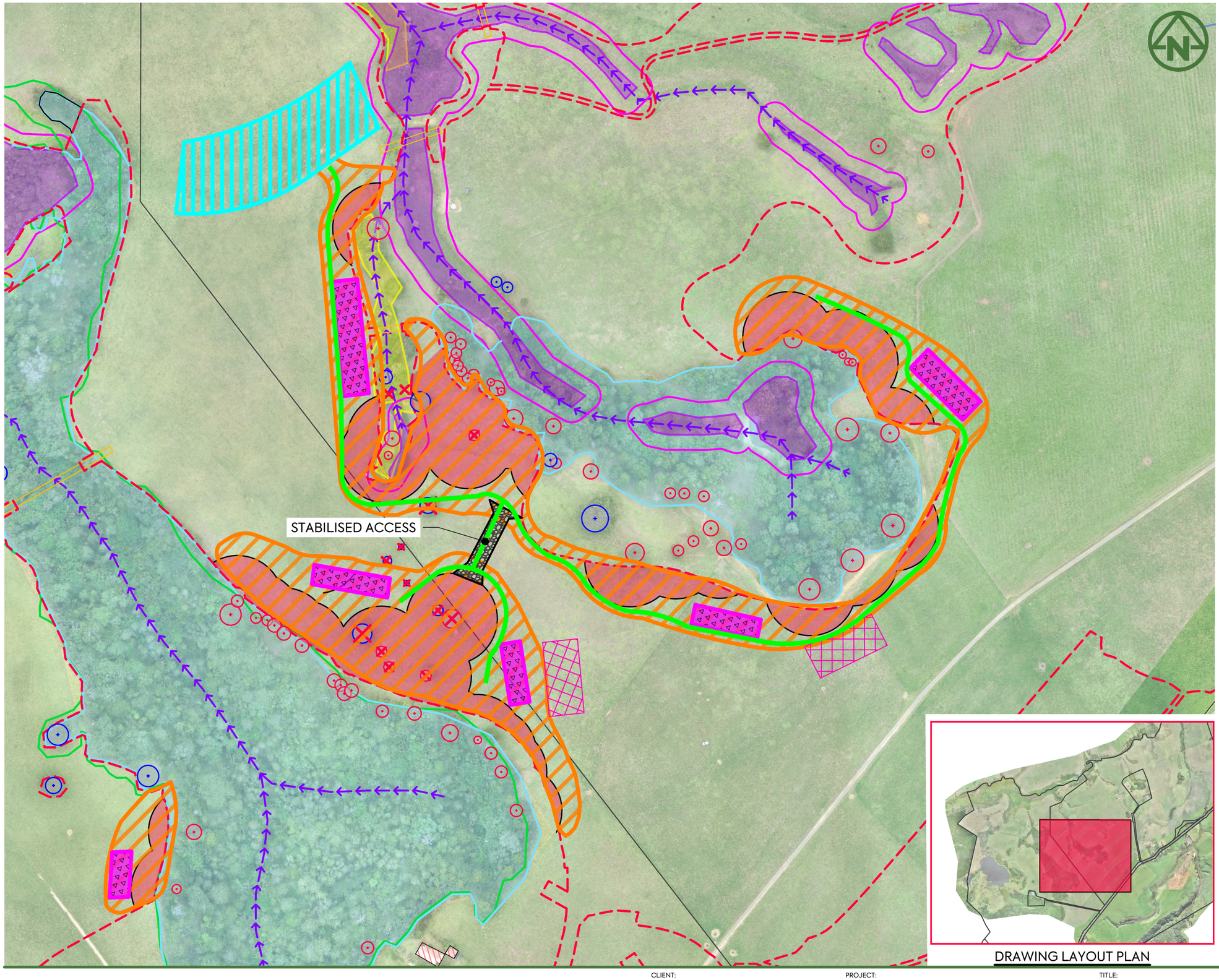

NOTES:

1. ALL LEVELS ARE IN TERMS OF AUCKLAND VERTICAL DATUM 1946 (MSL). THE CONTOUR INTERVAL IS: 1.0m
2. EARTHWORKS SHALL NOT EXTEND PAST THE AREA SHOWN ON THE PLANS.
3. ALL CLEARING OF VEGATATION TO BE SUPERVISED BY AN AUTHORISED ARBORIST AT ALL TIMES. NO WORKS TO BE DONE UNDER DRIPLINE UNLESS AUTHORISED.
4. ALL VEGETATION AND WETLANDS SHOWN ARE BASED ON INFORMATION PROVIDED BY RMA ECOLOGISTS LTD.
5. KAURI DIEBACK CONTAMINATED AREA ASSUMED TO BE 3 TIMES THE RADIUS OF THE OUTERMOST CANOPY DRIPLINE.
6. TOPSOIL STOCKPILES TO BE COVERED ONCE EXCAVATED UNTIL SUCH TIME AS THEY ARE TO BE PLACED BENEATH FINAL TOPSOIL RE-SPREAD. TOPSOIL PILES SHOULD BE DAMPED DOWN AT TIME OF RESPREAD TO MINIMISE DUST RISK.
7. THIS PLAN TO BE READ IN CONJUNCTION WITH THE KAURI DIE BACK MANAGEMENT PLAN.
8. NO WORK TO COMMENCE WITHOUT ECOLOGIST AND ARBORIST FIRST AGREEING EXTENTS OF WORKS.
9. CONTRACTOR TO HAVE ALL NECESSARY CLEANING EQUIPMENT AVAILABLE ON SITE PRIOR TO WORKS COMMENCING TO ALLOW FOR STAFF AND MACHINERY MOVEMENT FROM THIS WORKS AREA.
10. THESE WORKS ARE TO BE COMPLETED AND STABILISED PRIOR TO BULK EARTHWORKS IN THE BALANCE AREA COMMENCING.

LEGEND:

- EXTENT OF WORKS
- 10m BUFFER FROM WETLAND
- EXISTING WETLAND (TO BE PROTECTED)
- MAPPED SEA (BY ECOLOGIST)
- COUNCIL SEA AREA
- COUNCIL ONF AREA
- EXISTING KAURI TREE (TO BE CONFIRMED)
- EXISTING TREE OF INTEREST (TO BE CONFIRMED)
- KAURI DIEBACK CONTAMINATED AREA TO BE DISTURBED
- EXTENT OF KCZ
- PROPOSED FILL ZONE
- CONTRACTOR YARD
- TOPSOIL STOCKPILE
- KCZ HAUL ROUTES

DRAWING LAYOUT PLAN

MCKENZIE & CO.

CLIENT: THE BEARS HOME PROJECT LIMITED

PROJECT: MURIWAI DOWNS GOLF COURSE
610 & 697 MURIWAI ROAD
MURIWAI VALLEY

TITLE: KAURI DIEBACK CONSTRUCTION MANAGEMENT PLAN

PURPOSE OF ISSUE: FOR CONSENT

SCALE: 1:2500
DO NOT SCALE

DRAWING NO: 1976-1-195

REV: A

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
A	FIRST ISSUE	MO	SM	JSD	20/04/22

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