Michael Randall

From: Michael Randall
Sent: Monday, 5 June 2006 6:25 PM
To: 'ray.osborne@dse.vic.gov.au'
Cc: Edgar Elksnis
Subject: FW: Kew Cottages - Aboricultural Management Plan
Attachments: 06R2225_Kew Cottages.pdf

Hi Ray,

Further to my letter earlier today, please find attached the final version of the Pc management plan.

Please consider this document in conjunction with the Arboricultural Management Plan prepared by Galbraith Associates as submitted for approval under condition 3 of the heritage permit issued for Stage 1.

Please do not hesitate to contact myself should you have any queries.

Regards,

Luke McKie

0408 373 903

From: Luke McKie
Sent: Monday, 5 June 2006 5:51 PM
To: Michael Randall
Subject: FW: Kew Cottages - Aboricultural Management Plan

Regards,

Luke McKie
Development Manager
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From: Glenn Waters [mailto:glenn.w@treelogic.com.au]
Sent: Mon 5/06/2006 1:06 PM
To: Luke McKie
Subject: RE: Kew Cottages - Aboricultural Management Plan

Report & letter

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PHYTOPHTHORA CINNAMOMI MANAGEMENT PLAN

FOR

KEW COTTAGES, KEW

REPORT PREPARED BY:
GLENN WATERS
DIRECTOR/CONSULTING ARBORIST
TREE LOGIC PTY.LTD.

REPORT COMMISSIONED BY:
WALKER CORPORATION PTY. LTD.
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MAY 2006

Phytophthora cinnamomi Management Plan

Kew Cottages, Kew

Table of Contents:

Phytophthora cinnamomi Management Plan

Kew Cottages, Kew

1 Key Objectives

1.1 To review the relevant documentation regarding the subject site and provide an overview of the management objectives for the project at Kew Cottages, Kew.

1.2 To provide a detailed Phytophthora cinnamomi Management Plan for the site and the project with focus on the existing fungal pathogen issues and their control in terms of future management of the site including any relevant remedial guidelines and specifications.

2 Methodology

2.1 Documentation review was carried out in mid May 2006. All relevant documentation received from the client was reviewed. A cursory site inspection was carried out and individual tree on the site viewed but no detailed assessment of individual tree was done. No samples of site soil or trees were taken.

3 Documentation & Literature

I have viewed and reviewed the following documents:

3.1 Enspec – Site Inspection report (31/3/2006).

3.2 School of Forest and Ecosystems Science – Plant Health Diagnosis Results (27/2/2006).

3.3 School of Forest and Ecosystems Science – Site Inspection Notes (15/2/2006).

3.4 Department of Sustainability and Environment – Draft Strategic Plan for the management of Phytophthora cinnamomi in Victoria (December 2005).

3.5 Department of Environment and Heritage – Phytophthora Root Rot; Information Sheets (2004).

3.6 Government of South Australia - Phytophthora Management Guidelines (2003).

4 Introduction

The re-development of this site is covered by a Heritage Victoria permit. Part of this permit requires that

"An Arboricultural Management Plan, prepared by an arborist is to be submitted for approval by the Executive Director prior to the commencement of the new development on the site. The plan must show or demonstrate: (amongst other things)

- A full management plan for dealing with *Phytophthora cinnamomi* on the site."

This Management Plan will cover the Arboricultural issues with emphasis on the Phytophthora issues on the site while providing advice and guidelines for ongoing tree management objectives.

5 Document Overview

The Enspec Preliminary Site Inspection and Summary Report outlined the condition of a Bishop Pine (Pinus muricate) adjacent to Lower Drive and Lower Lane. This report also outlined the following broad recommendations:

- Development and implementation of a hygiene management procedure defining the correct method of cleaning tools and mechanical equipment.
- The testing of excavation sites within 100 metres of the current defined infected site to ascertain in *Phytophthora cinnamomi* is present.
- It is recommended that the Pinus muricata discussed in the report is removed. When (sic) all wood, branches and foliage should be disposed in accordance with the Department of Sustainability and Environment's handling of *Phytophthora cinnamomi* infected wood.
- It is recommended that all trees in the gardens should have chlorophyll fluorescence readings completed. "Finger prints" of these readings should be made for ongoing reference. Ongoing monitoring should be completed; this will allow for early detection of pathogens and or stresses within the tree and allow time for controls to be put in place to assist in preserving the trees health.
- It is recommended that all trees on the site have mulch applied under the canopy's drip lines to help prevent the movement of soil and increase organic matter.

6 Discussion

The current project is a 360 lot housing and apartment redevelopment of the former Kew Cottages site. The site is approximately 27ha of which 30% will be allocated to public open space as parkland. This construction for this development is planned to be spread over 6 years with Stage 1 consisting of 75 dwellings and housing construction is planned for commencement in October 2006.

Given the identification of a *Phytophthora cinnamomi* infection with at least one tree having the fungus identified as being a causal agent of its rapid decline, the Arboricultural Management Plan for this site must address this issue as one of its major functions.

Arboricultural Management Plan.

Galbraith and Associates, Arboricultural Consultants have produced an Arboricultural Management Plan for the Kew Cottages site which addresses a range of issues and makes recommendations with regard to the monitoring, maintenance and management of the existing trees on the site for the period of the project. This Phytophthora cinnamomi Management Plan should be read in conjunction with this Arboricultural Management Plan.

7 Background and Phytophthora cinnamomi Information

General Phytophthora Information.

Phytophthora root rot is a soil borne fungus-like disease that only affects plants and is not a disease that can affect humans. This disease attacks the root system (and sometime the stem) of a plant, hence the name Root Rot. There are many species of this pathogen throughout the world but the species that is prevalent throughout much of Australia is *Phytophthora cinnamomi.*

Phytophthora cinnamomi commonly is called Cinnamon Fungus but is actually a water mould and more closely related to certain algae. It is a soil-borne plant pathogen whose growth and reproduction is favoured by free water available in or on top of soils.

This pathogen infects plants and spreads throughout the root system until it girdles the roots and stems of the host plant and impedes the plants ability to absorb nutrients and water thereby forcing the plant into severe decline and death. These symptoms are often associated with 'dieback' which is considered to be the wilting, yellowing and death of parts of the foliage of a plant.

However, it must be understood that 'dieback' is a multi-faceted process that can be caused by a wide range of issues and conditions. Dieback can be caused by waterlogging, drought, insect pests and old age as well as by a variety of fungal pathogens. It is not correct to assume that any plant or tree on the subject site that is displaying 'dieback' should be automatically assumed to be suffering from a Phytophthora infection.

This pathogen can be spread by movement of infected plants or soil and naturally by mobile spores aided by surface water run-off and sub-surface soil water movement. Once infection is found on a particular site the pathogen is extremely difficult to eliminate and control.

Introduction & Spread.

It is widely believed that Phytophthora was introduced into Australia through early European settlement and was first detected in 1935. Since that time it is now reported to have spread to almost all states across the country with the exception of the Northern Territory.

It must be understood that there are currently no known ways to practically eradicate this pathogen.

Phytophthora can spread naturally via mobile spores and soil water runoff and can also move via root to root contact between plants. However, the main source of spread is via human action and particularly by earthmoving vehicles. Pedestrian and animal movement can also be problematic but is less of an issue when compared to the impact of major soil moving activities.

The impact of Phytophthora is limited in Victoria by factors including temperature, rainfall, soil type and drainage. It has spread throughout much of southern Victoria with numbers of native susceptible species ranging from 10-80 in varying areas. However, is should be understood that Phytophthora has not spread uniformly in most areas and it cannot be assumed that once an infection has been isolated that widespread areas are infected.

KEY POINTS:

- Phytophthora has been identified on the Kew Cottages site.
- Phytophthora root rot is a soil borne fungus-like disease that only affects plants and is not a disease that can affect humans.
- It is a soil-borne plant pathogen whose growth and reproduction is favoured by free water available in or on soils. This makes the movement of soil within the subject site particularly important.
- Phytophthora causes root rot of infected plants which can cause 'dieback' symptoms such as the wilting, yellowing and death of parts of the foliage of a plant. However, it is not correct to assume that any plant or tree on the subject site that is displaying 'dieback' should be automatically assumed to be suffering from a Phytophthora infection.
- Phytophthora is spread by movement of infected plants or soil and naturally by surface water run-off and sub-surface soil water movement. Once infection is found on a particular site the pathogen is extremely difficult to control. There are currently no known practical ways to eradicate this pathogen.
- It must be assumed that Phytophthora is spread across the entire site (unless testing confirms otherwise). Hygiene measures to control Phytophthora spread will be part of normal site works.

Site Issues.

A range of issues must be dealt with on any infected site. The management should involve monitoring, evaluation, hygiene, prevention and control.

Testing, Monitoring & Evaluation

The current defined infection site should be mapped and available for all site managers and contractors. These plans should be updated whenever new testing is carried out.

Prior to any major excavation works within the Stage 1 site, soil tests should be conducted to ascertain whether *Phytophthora cinnamomi* is present. Preliminary advice from School of Forest and Ecosystems Science at the University of Melbourne would suggest that approximately 10-15 individual test sites across the area of Stage 1 would be sufficient to map the spread of the pathogen. These individual samples should be taken from approximately 20-30 deep with a mix of soil from the test hole taken. Tests should concentrate on areas where there are existing trees or shrubs as this will be where infections area likely to be found.

Sampling and testing should be carried out by experienced personnel and this is best contracted to the School of Forest and Ecosystems Science at the University of Melbourne, Heidelberg or to Crop Health Services at the Institute for Horticultural Research, Knoxfield.

Once testing is done Phytophthora risk areas can be set up with a rating (High. Moderate, Low) that will guide the protocols that are required in each area. These protocols are crucial to contain further spread of *Phytophthora*. 'High Risk Zones' will be those sites that have extensive *Phytophthora* contamination confirmed from site observation and/or testing while 'Moderate Risk Zones' may still have *Phytophthora* contamination but at a lower level or in limited areas.

Testing will be required when construction works progress to additional Stages. Mapping and Risk Zones can then be modified. The information provided by the new soil tests should be collated and the Phytophthora Plan updated and distributed.

Trees can be monitored and evaluated for prevention and control measures by visual inspection. This should be done as part of the Arboricultural Management Plan provided by Galbraith and Associates.

Soil Movement

Advice from the School of Forest and Ecosystems Science would suggest that soil movement within the site should be monitored to ensure that soil from an infected area is not moved or used on a non-infected area. This may require that site soil is taken off site for disposal. Normal public tip sites can be used for the disposal of infected soil as such sites are unprotected and already take a range of contaminated materials and would generally be infected already.

Soil to be taken off site does not need to be fumigated prior to leaving the site; however the transport vehicle should leave the site through a standard clean down wash area to ensure that infected soil in no spread off the site.

Hygiene

Hygiene management procedures must be developed and implemented for the site. This should include appropriate training for all managers, employees and contractors.

The main avenue for hygiene on the site will be a wash down facility that would normally be provided for machinery and vehicles when leaving an infection site. The wash water used in the wash down facility should be mixed with a disinfectant. It is recommended that Phytoclean® is utilised for this purpose at a rate of 2lt/100lt. Phytoclean® is a new disinfectant cleaner specially designed for the control of Phytophthora cinnamomi in Horticultural, plantation, earth moving and quarrying industries. The base ingredient is Benzalkonium chloride (alkyl dimethyl benzyl ammonium chloride) and has shown to be effective in low

concentrations and will effectively eliminate any active spores. The wash down facilities should incorporate some type of sump filter so that used wash water is not fed back onto soil on the site.

Phytoclean® is available in Victoria from Fertool Distributors in Hallam.

Prevention

Tree work onsite in a designated High Risk area will need to be carefully monitored to ensure that pruning debris does not collect soil and that equipment including woodchippers is cleaned down on site. The main trunk and foliage of an infected tree can be safely removed off site to a public land fill or can be chipped and used elsewhere on the site as the chances of infection for such material is almost nonexistent.

It is recommended that all trees on the site have mulch applied under the canopy's drip lines to help prevent the movement of soil and increase organic matter.

Soil water movement should also be monitored and be part of the overall plan for the site.

Any irrigation requirements will need to be carefully assessed and planned so that the existing waterlogging and soil water issues are addressed and not exacerbated.

Control.

Where the pathogen is actually identified on the site, it is not practicable or reasonable to attempt to undertake control measures currently any registered chemical.

If an existing tree is identified as having a Phytophthora infection, chemical control may be used to reduce the impact to the individual tree. The main chemicals that are currently registered for use against Phytophthora cinnamomi have three main active ingredients. Phosphite, which is usually Phosphorous Acid present as Mono-Di Potassium Phosphite, Metalaxyl and Fosetyl present as Aluminium Salt.

There are a range of chemical or trade names that contain these products with the more well known ones being Ridomil® (Metalaxyl) and Foli-R-Fos®, Agri-Fos® and Phosacid® (Phosphite). Phytoclean® can also be used as a soil drench with a 1% solution being found to be effective in eliminating the pathogen from infected soils.

As stated above, chemical control should only be used where an existing tree is known to be suffering an infection.

8 Conclusions & Recommendations

- Phytophthora has been identified on the Kew Cottages site with currently one (1) with an actual identified infection. Phytophthora root rot is a soil borne fungus-like disease that only affects plants and is not a disease that can affect humans. It is a soil-borne plant pathogen whose growth and reproduction is favoured by free water available in or on soils. This makes the movement of soil within the subject site particularly important.

- Phytophthora causes root rot of infected plants which can cause 'dieback' symptoms such as the wilting, yellowing and death of parts of the foliage of a plant. However, it is not correct to assume that any plant or tree on the subject site that is displaying 'dieback' should be automatically assumed to be suffering from a Phytophthora infection.

- Phytophthora is spread by movement of infected plants or soil and naturally by surface water run-off and sub-surface soil water movement. Once infection is found on a particular site the pathogen is extremely difficult to control. There are currently no known practical ways to eradicate this pathogen.

- It must be assumed that Phytophthora is spread across the entire site (unless testing confirms otherwise). Hygiene measures to control Phytophthora spread will be part of normal site works.

Specific Recommendations.

- The entire Kew Cottages site should be considered to be infected until sampling and testing confirms actual infection locations.
- Phytophthora mapping (sampling, testing and mapping) should be undertaken as soon as possible within the Stage 1 area to determine the requirements for reduction of spread and hygiene practices.
- It is recommended that the School of Forest and Ecosystems Science at the University of Melbourne be contracted to undertake grid sampling and testing for the area of Stage 1. This data should then be used to map the infection.
- A wash down bay with appropriate recycling or sump facilities should be set up for all vehicles leaving the site. These wash down facilities should incorporate the addition of Phytoclean® into the wash down water at the listed label rates (2lt/100lt).
- Where control of individual trees is required it is recommended that Ridomil® is used at the label rates for soil drenching. Such works should only be carried out by trained and competent chemical applicators.
- The requirements for the Arboricultural Management Plan should be followed and any tree work on site planned around the infection site mapping. This should include the regular inspection of existing trees with a view to assess decline symptoms and action additional testing where required.
- Any movement of site soil should ensure that no movement occurs from infected site to a non infected area.

GLENN WATERS
Director/Consulting Arborist

9 Appendix 1: Phytophthora Control Plan & Information

SITE HYGEINE PROCEDURES
(staff, contractors and visitors)

Aims:

- To undertake investigation and evaluation into the extent and significance of the *Phytophthora* infection across the Kew Cottages site.
- To reduce the risk of spreading *Phytophthora* disease on the subject site.
- To apply best hygiene practices that prevents contaminated soil, vegetation, equipment & raw materials spreading to other areas of the site.

Site Operations:

- Nominate a *Phytophthora* Coordinator who is to maintain and update the Plan and Risk Zone map.
- Maintain familiarity with this procedure and amendments including the *Phytophthora* Plan and High Risk Zone map by providing relevant information to contractors and visitors.
- Plan all construction activities using the *Phytophthora* Plan and Risk Zone map.
- Report any sick, dying or recently dead plants or trees to the nominated officer and to the Arborist for further investigation and testing.

Clean Down Procedures:

- Ensure that all vehicles exiting the site use allocated wash down site.
- Ensure that the recommended 'fungicide' Phytoclean® is added to wash down water at label-recommended rates.
- Ensure that all loose soil is washed from the vehicle with particular attention paid to tyres, wheel wells and underbody areas.
- Ensure that the soiled footwear is also cleaned and/or washed prior to leaving the site.

Tree Logic Pty. Ltd.

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