Memorandum

To	Stephen Cornwall - Veros
Copy	
From	Lisa Bond
Office	Alexandra
Date	5 July 2021
File/Ref	6-XZ320.00
Subject	Wooing Tree Subdivision - Additional information regarding soil contaminant assessment

Dear Stephen,

Further to our recent discussions regarding the Detailed Site Investigation completed in 2016 by Opus (Now WSP), please see our additional comments relating to the further work completed on site and the published information which has subsequently become available regarding the assessment of risks to human health associated with soil contaminants with respect to the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NES-CS 2011).

A Detailed Site Investigation (DSI) completed by Opus in November 2016 concluded that soil analysis results for heavy metals and organochlorine pesticides (OCP) were below relevant soil guideline values for a residential end use.

Sampling and analysis at this time was completed on a judgemental basis within a grid, however no data was recorded at the time as to the proximity of any of these samples to any of the timber posts used within the vineyard.

Since the issue of the Opus report the vineyard operations have changed hands with Grape Vision Limited now running viticulture activities on the site. On the basis of information currently available WSP understands that no changes to site operations have occurred as part of this change of ownership, therefore findings and details of site operations within the Opus 2016 report remain relevant to the vineyard site at this time.

Further investigations have now occurred on part of the Wooing Tree site as part of the development proposals being carried out by Waka Kotahi for a proposed roundabout and underpass. The development links the Wooing Tree development area with SH8A and Barry Avenue. As part of these investigations a DSI was undertaken by WSP. These works were completed in May 2021.

In light of recent national research and published findings, which have come to light since the investigations were completed in 2016 the recent May 2021 DSI completed soil investigations to determine whether leaching from the treated timber posts had occurred or not.

WSP
Alexandra
Tarbert Buildings
69 Tarbert Street
Alexandra 9320, New Zealand
+64 3 440 2400
wsp.com/nz

Results of the 2021 DSI indicate that arsenic concentrations were found to be marginally elevated within soils directly adjacent to the post locations. However, the results fell below relevant soils contaminant concentrations (SCS) at 200mm radius from the posts and beyond.

The Maximum concentration encountered adjacent to posts were approximately 30mg/kg (Arsenic) falling to below 15mg/kg at 200mm distance. No other contaminants of concern were found to be in excess of relevant SCS for a residential end use.

As these contaminant levels are considered to be a very small halo around the timber posts, the majority of soils on site are therefore well within acceptable soil concentrations for a residential end use.

Using the methodology presented in the published research, (Making good decisions: Risk characterisation and management of CCA post hotspots at vineyards and kiwifruit orchards, 2018, published by the Waikato Regional Council (WRC)), indicates that for a residential section of 600m^2 approximately 0.8% of the soils on the section are likely to be impacted by arsenic contamination associated with leaching from the timber posts.

Based on the concentrations encountered Soil Mixing is considered to be an appropriate remedial measure on this site.

Equation 1 of the WRC report indicates the maximum soil concentration that may be present (where the posts were located) to ensure that the soil remains suitable for the proposed use:

$$C_{max} = \frac{H - B(1-F)}{F} \times 0.9$$ **...Equation 1**

where:

H = soil guideline value (mg/kg)
B = background concentration (mg/kg)
F = fraction of site volume in top 500 mm (considered relevant for soil mixing) contaminated from posts (unitless), which is calculated to be approximately 1.2% (or 0.012).
The value of 0.9 is a safety factor which takes into account inefficiencies in the mixing process (consistent with the New South Wales Environmental Protection Agency approach).

For soils on this site where H = 20 mg/kg and B = 12 mg/kg, the C_{max} would be **610.8 mg/kg**.

Soil concentrations have been shown to be generally lower than 30mg/kg on the site. Soil mixing is therefore considered appropriate, providing that some validation sampling and analysis of the completed re-levelling and placing following earthworks to ensure that mixing has occurred and is sufficient for the residential end use proposed.

We trust that the above information is sufficient to adequately address the RFI received by yourselves, however, should you require any further clarification please do not hesitate to contact me

Regards

Lisa Bond CEnvP
Work Group Manager – Environment & Planning