REPORT

Tonkin+Taylor

PART 1 OF 2

Environmental Site Assessment

Kinley Estate Western Area

Prepared for

Hume Lilydale Pty Ltd & LBJ Corporation Pty Ltd

Prepared by

Tonkin & Taylor Pty Ltd

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Exceptional thinking together

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1 Introduction

Tonkin & Taylor Pty Ltd (T+T) was engaged by Hume Lilydale Pty Ltd & LBJ Corporation Pty Ltd (the client) to conduct Environmental Site Assessment (ESA) works at the Kinley Estate Western Area at 4 Melba Avenue, Lilydale (the site). The location of the site is shown in Figure 1 (Appendix A).

1.1 Background

The site forms part of the former Lilydale limestone quarry, which has ceased operation and been sold to the client for a proposed residential development. The portion of the site under investigation is referred to as the "Western Area" of the development, and is located to the west of the existing Lilydale Rail Line and bound by Mooroolbark Road to the west, Maroondah Hwy and Taylor Street to the north, and a portion of the larger quarry site referred to a 'Stage 1', to the south. Stage 1 has previously been subject to an Environmental Audit and was issued with a Certificate of Environmental Audit in 2010, updated in 2015[1].

Prior to purchase of the site by the client, investigations were completed by others to support a proposed government lead redevelopment of the site. Those investigations included comprehensive site history investigations with preliminary targeted sampling at potential point sources of contamination.

Based on those assessments it is understood the Western Area has been utilised only for grazing purposes since the 1800s and was concluded to have a low potential for contamination.

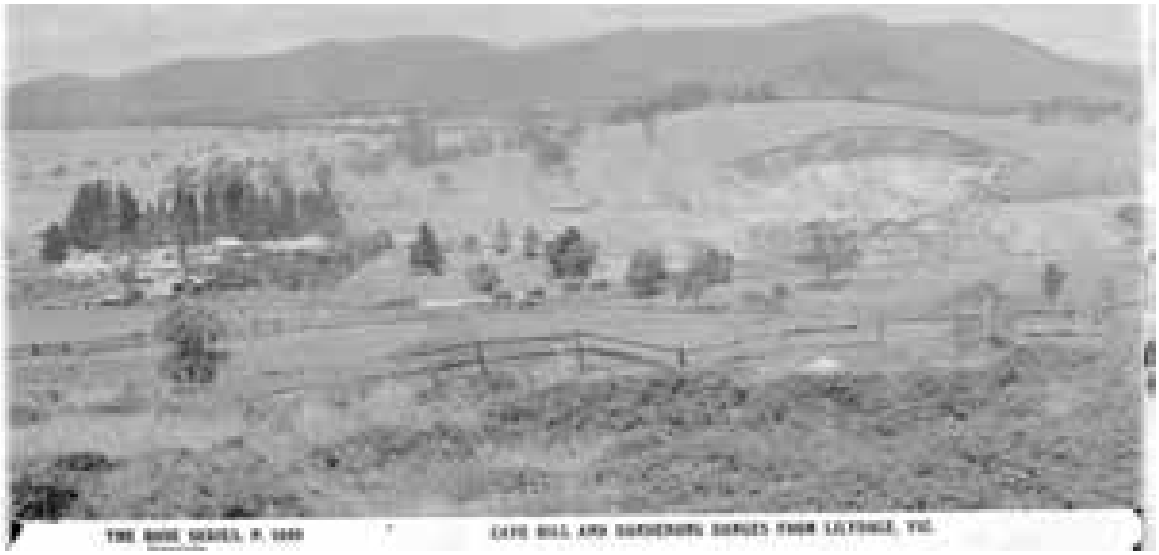


Figure 1.1: Early photograph of the site, from the vicinity of Maroondah Hwy/Mooroolbark Rd, showing cleared paddocks for grazing in the foreground (the subject site), with early stages of mining activity and farm manufacturing on the far side (east) of the rail line (i.e. offsite).

The client is undertaking a rezoning of the land, to allow for residential use, and is undertaking this additional investigation to assist Council in deciding whether an Environmental Audit Overlay (EAO) should be placed on the Western Area. In accordance with *Practice Planning Note PPN30 Potentially Contaminated Land,* a site with a low potential for contamination should not require completion of an Environmental Audit, or a Detailed Site Investigation. However, Council and EPA requested further assessment of the site to support the previous preliminary investigation findings.

[1] CARMS 655161-1

It is understood that an in-principle agreement has been reached with Council that an EAO is not required for this portion of the site, based on available information on historical land use (and prior investigations), and subject to the outcome of these further investigation works. It is also understood, an EAO will be placed on the land to the east of the rail line, which has been subject to quarrying, stockpiling of overburden and manufacturing activity (production of aglime, small scale farming activities), which may have resulted in some contamination of the land.

A work plan was submitted to Council and EPA[2], and accepted for the purposes of this ESA. A copy of the work plan is provided in Appendix B.

1.2 Objective

Based on discussions with the client, Council and EPA, the objective of the ESA was to

1 Collect data to determine whether there are any likely unacceptable risks to potential future users of the site, including collection of quantitative chemical data relating to surface soil and qualitative data relating to whether aesthetic impacts are present, or likely to be present.

2 Based on the assessment of risk, confirm the position that an Environmental Audit of the site (through placement of an EAO) would not be required.

[2] Re: Kinley Estate Western Area - Environmental Assessment Work Plan, Tonkin & Taylor Pty Ltd, 28 June 2019

2 Scope of works

The following environmental assessment works were undertaken:

1. Review of existing environmental reports for the land
2. Soil sampling using a 3 tonne excavator to complete test-pits (as shown in Figure 3, Appendix B) at:
   - 42 grid-based locations across the site generally to depths of 0.5m, or to 0.2m in areas near services or subject to heritage overlays.
   - Three targeted surface samples within drainage lines
   - Two targeted surface samples within two former onsite dams
   - One targeted surface sample within a former cattle yard
3. The soil sampling works included:
   - pre-commencement safety briefing;
   - review of underground services information;
   - soil logging by a qualified environmental scientist;
   - photo-ionisation detector (PID) logging;
   - collection of samples into laboratory prepared sampled jars;
   - transport of samples in chilled containers to the laboratories with accompanying chain of custody documentation
   - analysis of samples for chemical analysis as nominated in Table 2.1 (based on the contaminants of potential concern ('COPC') associated with grazing use and the target locations and to obtain general soil parameters for screening level calculations);
   - analysis of Quality Control (QC) samples (two split and three blind duplicates, three trip blank and three decontamination rinsate blanks).
4. Compilation of a report detailing assessment findings of the current condition of soil at the site in relation to the site's proposed land use.

The adopted sampling density was less than the sampling frequency set out in Australian Standard AS4482.1-2005 (for detection of circular hotspots) but was considered appropriate for a site of this size with no obvious historical contaminating activities identified. A density of approximately 1 per Ha was considered sufficient for screening purposes for broad scale application of farming related chemicals (pesticides, metals) and likely natural conditions at the site, with targeted sampling at infrastructure onsite.

The scope of works was focussed on providing additional assessment of potential soil contamination. No groundwater investigation was proposed based on:

- The absence of any likely sources of groundwater contamination (with reference to EPA Publication 759 where groundwater is unlikely to be polluted, it does not need to be investigated);
- The significant depth to groundwater due to drawdown for historical quarry dewatering; and
- Noting that no investigation of groundwater was completed for Audit of Stage 1 (boreholes were drilled for geotechnical purposes to depths of at least 20 m below ground level, and in the absence of groundwater at those depths, and source of contamination, no further sampling or investigation works were required).

Similarly, no landfill gas or soil vapour investigations were proposed or considered necessary (other than field PID screening) in the absence of any identified landfills within 500 m of the site or other source of volatile contaminants in use at the site. No vapour investigations were required by the

Auditor for the Stage 1 Audit, which had similar historical land use (undeveloped for quarrying purposes) and received a Certificate of Environmental Audit.

The analytical schedule, set out in Table 2.1, reflected the limited suite of contaminants of potential concern identified in prior desktop site investigations (supported by T+T's review).

Table 2.1: Nominated Analytical Schedule

Soil Sample Analysis Type - Grid	No. of Sample Analyses
%Fe, Cation Exchange Capacity (CEC), %Clay, Total Organic Carbon (TOC)	3
Metals screen[3], Organochlorine pesticides (OCPs)	42
Soil Sample Analysis Type - Target	
Drainage lines - Metals screen, OCPs	3
Dams - 'IWRG 621' screen[4]	2
Cattle yard – Metals screen, OCPs	1
Soil Sample Analysis Type - QC	
Metals screen, OCPs	3

In relation to the testing schedule:

- No specific contaminating activities were identified across the site and no specific contaminants of concern were identified. The testing program for the 'grid' samples was therefore limited to metals and OCPs, as the most likely residual contaminants associated with any past agricultural practices (which we understand was limited to grazing).
- Organophosphorus pesticides, which had previously been identified as a COPC in the desktop assessment by PJ Ramsay & Associates (2015) were not included in the proposed testing suite as these contaminants were not identified above the limit of reporting in subsequent sampling and analytical works completed by them. These compounds typically also have short half-life (weeks to months) in comparison to OCPs, and were therefore not expected to be present, considering the site had been disused for at least 4 years.
- Metals and OCPs were selected as the main target compounds of interest along drainage lines and in the cattle yards (where pesticide sprays may have been used).
- A broad contaminant suite was adopted for the former dam area in the event that any soils have been imported to these locations.
- %Fe, CEC, %Clay, TOC were analysed to allow for calculation of site specific Ecological Investigation Levels, in accordance with the *National Environment Protection (Assessment of Site Contamination) Measure 1999* ('ASC NEPM').

No sources of potential contamination were identified during the field program (e.g. unexpected areas of filling, or odorous or stained soils), therefore the analytical program was not augmented to assess potential for unknown contaminants.

[3] As,Be,B,Cd,Co,Cu,Hg,Pb,Ni,Mn,Se,Zn, Cr6+

[4] TPH, VOC, Vinyl Chloride, PAH, Phenols, OCP, PCB, Cr^{6+}, Metals (As,Cd,Cr,Cu,Ni,Pb,Zn,Hg,Ag,Sn,Mo,Se), Cyanide, Total Fluoride

3 Assessment guidelines

The site assessment was designed and completed in consideration of guidance within the documents:

- NEPC (1999) *National Environment Protection (Assessment of Site Contamination) Measure 1999*, as amended 2013.
- Australian Standard *AS4482.1-2005 Guide to the investigation and sampling of sites with potentially contaminated soil*
- Australia Standard *AS 4482.2-1999 Guide to the Sampling and Investigation of Potentially Contaminated Soil, Part 2: Volatile Substances*

3.1 Beneficial uses

The State Environment Protection Policy (Prevention and Management of Contamination of Land) ("SEPP PMCL") sets out the regulatory framework for the prevention and management of contaminated land within the State of Victoria. The intent of this framework is to maintain and maximise (to the extent practicable) the quality of the land environment in Victoria, in order to protect its existing and potential beneficial uses.

The SEPP PMCL identifies specific land use categories as well as a number of protected beneficial uses associated with each of the land use categories. The EPA considers that land (soil) is polluted where current and/or future protected beneficial uses for the relevant land use categories are precluded. Beneficial uses of land are considered to be precluded when relevant soil quality objectives set out in the SEPP PMCL, for those beneficial uses, have been exceeded.

It is understood the site is being considered for use for 'standard' residential including garden space. The beneficial uses of land requiring protection, based on the proposed land use, is shaded in the table below.

Table 3.1: Protected Beneficial Uses of Land

Beneficial Uses	Land Use						
	Parks & Reserves	Agricultural	Sensitive Use		Recreational /Open Space	Commercial	Industrial
			High Density	Other			
Maintenance of Ecosystems:							
· Natural Ecosystems	ü						
· Modified Ecosystems	ü	ü		ü	ü		
· Highly Modified Ecosystems		ü	ü	ü	ü	ü	ü
Human Health	ü	ü	ü	ü	ü	ü	ü
Buildings & Structures	ü	ü	ü	ü	ü	ü	ü
Aesthetics	ü		ü	ü	ü	ü	
Production of Food, Flora & Fibre	ü	ü		ü			

The guideline documents referenced in the SEPP PMCL and adopted by T+T to assess the protection of each relevant beneficial uses are presented below. Where contaminants of concern were detected but a screening level was not available in the referenced Australian guideline indicative screening levels were obtained from international guidelines with consideration to the risk approach adopted within the various guidelines.

3.2 Soil investigation levels

The primary source of soil investigation levels adopted for the site assessment was the National Environment Protection (Assessment of Site Contamination) Measure (ASC NEPM) 1999 (amended 2013).

3.2.1 Maintenance of Ecosystems

The 'A' Ecological Investigation Levels (EILs) presented in the ASC NEPM were adopted to assess protection of this beneficial use. The ASC NEPM EILs are derived for specified levels of percentage species protection depending on land use, in this instance, residential use ('A' setting). The application of EILs factors the capacity of the local ecosystem to accommodate increases in contaminant levels (referred to as the 'added contaminant limit' or ACL) above ambient background and the methodology assumes that the ecosystem is adapted to the ambient background concentration (ABCs). Therefore, the EIL is derived by summing the ACL and the ABC.

The ABC is established by testing of natural soils not expected to be impacted by on or offsite contaminating activities. However, for initial calculations ABCs have not been factored.

The ACL is a function of either the soil CEC or soil pH, and varies with land use and with soil properties (measured at site and inferred based on soils type). ACLs have been calculated for different soil types on the basis of samples collected from the different lithologies encountered at the site.

For calculation of EILs, T+T have used the EIL calculation spreadsheet provided in the ASC NEPM Toolbox on the Environment Protection and Heritage Council (EPHC) website. The calculations require inputs for a number of soil parameters and select soil samples collected from the site were submitted for analysis for these parameters.

The properties reported for soils are presented in the table below.

Table 3.2: Inputs to EIL Derivation

The factors used for the calculation have been taken from typical soil parameters as follows:

Parameter	Value (onsite natural soils)	Source
pH	6.9	Median value from samples DAM1, DAM2, TP24/0.1 and TP38/0.1 (onsite natural soil samples)
Cation Exchange Capacity (meq/100mL)	33	Average value from samples TP24/0.1 and TP38/0.1 (onsite natural soil samples)
Clay (%)	9.5	
Organic Carbon (OC) Content (%)	6.5	
Fe (%)	8.4	
State	VIC	Based on site location
Traffic volume	Low	

Parameter	Value (onsite natural soils)	Source
Age	Aged	Time since potentially contaminating activity is >2 years
Background concentrations	-	Background soil samples were not collected as part of the investigation and background concentrations have not been included in the EIL calculations.

T+T have used the EIL calculation spreadsheet provided in the ASC NEPM Toolbox on the Environment Protection and Heritage Council (EPHC) website. EIL calculation sheets are provided in Appendix E. The EILs derived for the various analytes are provided in the following table.

Table 3.3: Derived EILs

Analyte	Derived EILs (mg/kg)
	Clay
As	100
DDT	180
Naphthalene	170
Pb	1,100
Cu	230
Ni	380
Chromium III	400
Zn	850

The ASC NEPM does not include EILs for a number of contaminants of concern associated with the site and in such cases, EILs have been adopted from the Canadian Council of Ministers of the Environment (CCME), Canadian Soil Quality Guidelines (CSQG), 2007 Protection of Environmental and Human Health Residential/Parkland Use.

The ASC NEPM also provides Ecological Screening Levels (ESLs) which have been derived by applying Australian EIL methodologies (Schedule B5b of the ASC NEPM) to ecotoxicological data obtained as part of calculations for Canadian screening levels for hydrocarbon fractions and organic compounds.

The adopted screening levels and associated guidelines documents are shown in Table C1 (Appendix C). It is noted that where the alternative guidelines and the ASC NEPM both provide screening levels for a given analyte, only the ASC NEPM screening level has been considered.

3.2.2 Human Health

The Health Investigation Levels (HILs) contained within the ASC NEPM were adopted for the purposes of determining whether this beneficial use is precluded by the chemical condition of soils onsite.

The ASC NEPM 'A' HILs provide reference criteria to assess whether soil contamination poses a risk to human health for 'standard' residential land use (low density residential with garden space) as well as childcare centres and primary schools. The ASC NEPM 'A' HILs are also utilised as screening criteria for the protection of human health for construction and maintenance workers.

Where HILs are provided under different parameters (such as depth and soil type), initial screening has been conducted using the lowest screening level.

3.2.3 Buildings and Structures

For the protection of buildings and structures at the site, consideration has been given to the potential for the land to be corrosive to or adversely affect the integrity of structures or building materials. Specifically, consideration was given to pH and the likelihood that soils beneath the site may have a potential detrimental impact on the integrity of structures or building materials.

Guidelines levels for the protection of this beneficial use have be adopted from the ASC NEPM Management Levels which have been derived in consideration of fire, explosion and damage of buried infrastructure.

3.2.4 Aesthetics

The SEPP PMCL states that "contamination must not cause the land to be offensive to the senses of human beings". Currently there are no concentration-based aesthetic criteria for soil. While aesthetic observations are subjective, it is considered that if there is discolouration, noticeable odour from the soil on the site or if there are obvious components of waste, such as rubble, slag, bagged waste or similar, then there is a potential aesthetic concern.

3.2.5 Production Food, Flora and Fibre

The SEPP PMCL states that "contamination must not adversely affect produce quality or yield" and "affect the level of any indicator in food, flora and fibre produced at the site (or that may be produced) such that the level of the indicator is greater than specified by the Australian New Zealand Food Authority, Food Standards Code".

The Food Standards Code sets out the maximum level of specified metal and non-metal and natural toxicants in nominated foods, maximum residue limits for a chemical to be present in a food, extraneous residue limits for a pesticide residue to be on a food, and provides details with regard to permissible articles and materials.

Based on the above information, reference is made to the ASC NEPM EILs or other relevant EILs in the absence of ASC NEPM criteria.

4 Site Characterisation

4.1 Description

The site forms part of the larger former Lilydale quarry site, but has never been used for quarrying activity, having been cut off from those activities by the Lilydale Rail line.

The site is irregularly shaped and follows the curve of the rail line to the east and is bound by existing roads to the north, northwest and west. The investigation area comprised:

- Lot 1 TP810358 (282,954 m^2)
- Lot 2 TP810358 (part) (estimated at 89,700 m^2) and
- Lot 3 TP810358 (7,815 m^2)

The site is currently zoned Special Use Zone. Lot plan extracts are provided in Appendix I.

4.1.1 Topography

The site sits on the eastern side of a local topographic high point. In the north of the site land slopes steeply from Mooroolbark Road and Maroondah Hwy eastwards towards the rail line. Moving southwards, the land begins to fall away more to the south also. The topography is considered to somewhat reflect site geology, defined by the edge of lava flows of the Older Volcanics which cap much of the site (refer Section 4.1.2).

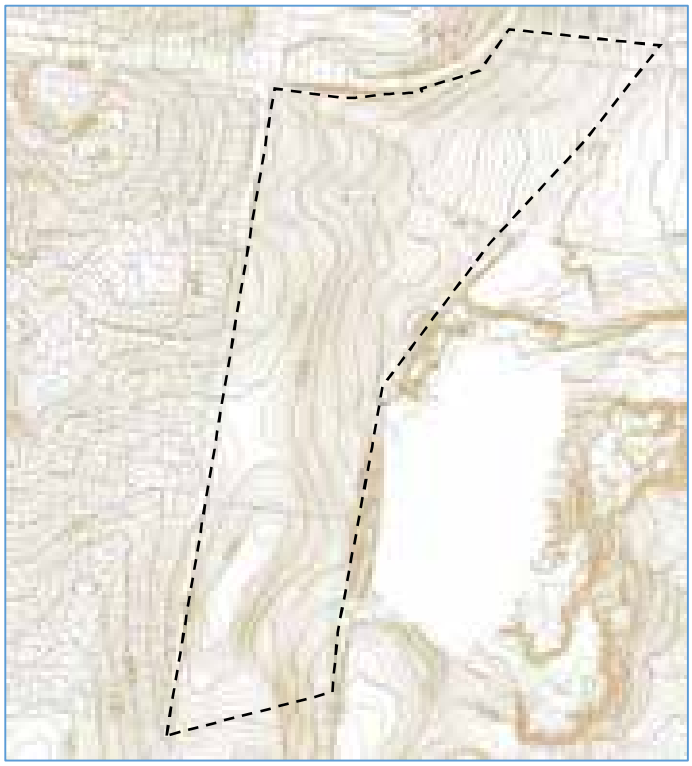


Figure 4.1: Site contours

Several natural drainage lines are formed in the north of the site by the steep topography, and small farm dams have been constructed adjacent to the drainage line in the north.

4.1.2 Geology

Surface geology comprises Humevale Siltstone (Devonian aged)('Dxh') in the north, with Greensborough Basalt (Tertiary Older Volcanics) ('Tvo') across the southern half of the site and offsite to the west. Minor recent (Quaternary) colluvium is mapped in the vicinity of the drainage line and minor Tertiary sediments underlying basalt near the southern end of the site.

4.2 Prior investigations

The following investigations that have evaluated the history of the Western Area and potential for contamination have been completed (and are available to T+T):

- *Phase 1 Environmental Site Assessment*, *Lilydale Quarry*, *Melba Avenue*, *Lilydale*, *Victoria*, *June 2015,* Prensa Pty Ltd, and
- *Preliminary Site Investigation Cave Hill Limestone Quarry*, *4 Melba Avenue*, *Lilydale*, *Victoria, September 2015,* Peter J Ramsay & Associates Pty Ltd (PJRA)

T+T has reviewed these reports as they relate to the subject site and summarised the findings below.

4.2.1 Presna (2015)

- The site was observed to comprise vacant grassed paddocks.
- A natural surface water course was identified in the northwest portion of the site, which was concluded to potentially receive recharge from off site from the roadside verge along Maroondah Highway. Flow direction within the open water course was expected to be from west to east following the natural steep topography in this area of the site. Overflow from the water course was observed to be directed to a small farm dam located on the western side of the railway line. The water course was reported to extend beneath the Lilydale railway line within a concrete conduit, before being diverted via an open earthen channel to the settling ponds located in the north east portion of the quarry site to the east.

- A small building was present at the site as identified in the 1952 aerial photograph (the building was located in an area of currently vegetated buffer land between Maroondah Hwy and the site).

4.2.2 PJRA (2015)

- At the time of the works the site consisted entirely of paddocks (disused during the works). It was stated in the report that the paddocks had been used for cattle grazing or hay production.
- A set of cattle yards (including a crush) was located in the northeastern portion of the site near the eastern boundary and adjacent to the rail line. The cattle yards were identified to be directly overlying soils (no hardstand cover). No staining or precipitates were identified. No evidence of sheep or cattle dips were identified.
- A forked drainage line which channelled surface runoff towards the site and two small stock dams were identified in the northern paddock.
- No suspected areas of filling were identified.
- A building was present at the site as identified in the 1965 aerial photograph (this is the same building identified in the 1952 aerial photograph in the Prensa 2015 report).
- Underground high voltage cable and sewer reportedly run through the site.
- Potentially contaminating activities were identified as grazing and pasture maintenance and pesticides and fertilizers were identified as contaminants of concern.
- One soil sample location was advanced targeting the cattle yards and three sample locations were advanced in the paddocks (although one of the samples was south of the current 'Western Area' investigation area, within land previously audited).
- The sample locations identified material comprised solely of natural clay material.
- Analytical results reported elevated cobalt, manganese and vanadium which were concluded to be naturally elevated.
- Other contaminants of concern were either not detected or were below the relevant guideline values.

4.3 Site inspection

T+T visited the site on 24-26 September 2019 and the following observations were made with respect to the site and its potential for contamination:

- The site consisted of large paddocks extending several hundred meters separated by fences with vegetation.
- The paddocks appeared to be used recently for grazing however no livestock was present at the time of the works.
- A cattle yard is present in the northeast of the site near the rail line. The cattle yard and dams suggest the site has been used for grazing (i.e., agricultural use).
- Two drainage channels are present, one running from near the intersection of Maroondah Hwy and Mooroolbark Rd, and a second from near Churchill Drive, which drain to the east towards the rail line.
- Two small dams are present on the site in the north, either side of the drainage lines.
- Vegetation across the site appeared healthy.
- No significant rubbish, litter, or aesthetic contaminants as observed across the site.

There is no evidence of any industrial, residential or commercial use on the land.

5 Soil Investigation methodology

5.1 Soil sample collection

T+T attended the site on 24-26 September 2019 to conduct a soil investigation. The investigation included advancement of 42 grid based test pits (TP01-TP42) using a 3 tonne excavator and five surficial shovel samples in targeted locations to collect soil samples and assess condition of soil across the site. The number of sampling locations was generally consistent with the proposed scope of works (refer Appendix A).

Test pits were generally excavated to 0.5m, with some locations advanced by hand auger to 0.2m due to excavation exclusion zones relating to offsite services and the presence of heritage overlays (natural soils were intersected at all shallower sample locations). Selected test pits were advanced to 0.6 m or 1 m to confirm natural soil depths. The location of each test pit is shown on Figure 4.

Sampling was generally conducted in accordance with EPA Publication IWRG 701 *Sampling and Analysis of Waters, Waste Waters, Soils and Wastes*. Samples were recovered directly from the centre of the excavator bucket taking care to select material that had not contacted the sides of the bucket (to avoid potential for cross contamination). Soil samples were collected as grab samples using new disposable nitrile gloves at each location. Samples were placed into clean glass jars supplied by the laboratory, and then transported to the laboratory in chilled containers with chain of custody (COC) documentation.

Further details of the soil sampling methodology are provided in the following table.

Table 5.1: Soil Assessment Methodology

Activity	Details/Comments
Review of Service Plans	Underground utility plans were reviewed prior to commencing intrusive works and the methodology (including sampling method and depth) was designed based on the requirements of nearby underground asset holders.
Decontamination of soil sampling equipment	Where non-disposable sampling equipment was used, decontamination was completed in general accordance with AS4482.1-2005 in order to minimise cross-contamination of samples from sampling equipment: · Removal of soil adhering to sampling equipment · Washing equipment in a bucket using potable water with Decon 90 and then rinsing with deionised water · Repeating the above steps where all potentially contaminating material was not removed
Soil vapour screening	Screening for volatile organics was conducted at soil sample locations and where volatile contaminants were of concern using a calibrated Photo-ionisation detector (PID). Details are provided on the sample logs.

5.2 Analytical Laboratories

All samples recovered during field works were submitted to a National Association of Testing Authorities (NATA) accredited laboratory to perform analyses (where accreditation exists) for this investigation in accordance with the COC documentation. The laboratories utilised for chemical analysis as part of this investigation were Eurofins|mgt (Eurofins) as the primary laboratory and ALS Group as the secondary laboratory. Copies of COC documentation are presented in Appendix F.

5.3 Analytical program

5.3.1 Initial analytical program

Forty-eight samples, not including quality control samples, were submitted to the laboratory for analysis primarily targeting near surface soils on the basis of either being fill material or having the potential to have been impacted by potential site activities. The analytical program is summarised in Table 5.2.

Table 5.2: Summary of soil analytical program

Sample ID*	Domain	Analysis
TP01, TP03-TP06, TP07-TP11, TP13-TP23, TP25-TP37, TP39-TP42	Clayey SILT	Metals[1], OCPs[2]
TP12	Fill (reworked natural clay)	Metals, OCPs
TP02	Fill (reworked natural clay)	Metals, OCPs, NEPM soil parameters[3]
TP24, TP38	Clayey SILT	Metals, OCPs, NEPM soil parameters
CAT1	Clayey SILT	Metals, OCPs
DAM1, DAM2	Silty CLAY	IWRG621 Screen
DRAIN1, DRAIN2, DRAIN3	CLAY	Metals, OCPs

* All grid (TP) samples labelled with '-0.1' suffix (e.g. TP03-0.1)

1. Arsenic, Beryllium, Boron, Cadmium, Cobalt, Copper, Lead, Manganese, Mercury, Nickel, Selenium, Zinc
2. Organochlorine Pesticides
3. %Fe, Cation Exchange Capacity, %Clay, Total Organic Carbon

5.3.2 Leachability testing

Following receipt of the initial analytical results, selected samples were analysed using the Australian Standard Leach Procedures (ASLP) method to obtain leachable concentrations of metals.

ASLP testing was conducted on samples reporting the maximum concentrations, namely:

- CAT1: ASLP copper
- DAM1, DAM2: ASLP chromium
- DRAIN3: ASLP zinc
- QC02 (replicate of TP24-0.1): ASLP cobalt and manganese
- TP11-0.1: ASLP copper
- TP25-0.1: ASLP nickel
- TP26-0.1: ALSP cobalt, manganese and nickel

5.3.3 Supplementary analytical

Following receipt of the initial analytical results, depth samples from 31 locations were analysed to provide further information on the vertical distribution of cobalt and manganese. This included samples: TP01-0.3, TP05-0.3, TP06-0.3, TP09-0.3, TP09-0.5, TP16-0.3, TP16-0.5, TP17-0.3, TP18-0.4, TP20-0.5, TP21-0.5, TP22-0.5, TP24-0.3, TP24-0.5, TP25-0.5, TP26-0.3, TP27-0.2, TP28-0.3, TP29-0.3, TP30-0.5, TP31-0.3, TP32-0.3, TP32-0.5, TP33-0.3, TP34-0.3, TP35-0.3, TP37-0.2, TP38-0.2, TP39-0.2, TP40-0.2 and TP42-0.2.

6 Results

6.1 Field observations

The site geology presented as almost entirely natural soil. Almost all locations, both gridded and targeted, had approximately 100 mm of dark grey clayey silt topsoil. TP37, TP38, TP41 and TP42, in the southern portion of the site had distinctly reddish brown clay which may indicate topsoil has not developed (or has been eroded) in this area noting that this reddish brown clay was also found at depth in other test pits within the site. The topsoil was usually underlain by either a dark grey or orange mottled light brown clay, with trace organic inclusions and/or trace limestone inclusions.

Two instances of 'fill' were noted. TP02 had red clay from 0 – 100mm, similar to that of the natural clays of the southern portion of the site, but it in an area where all the surrounding topsoil was dark grey. This is assumed to be disturbed natural clay moved from another part of the site. The second instance of fill was observed at TP12 where a terracotta pipe was found 500mm under surface. However, based on the similarity of the soil surrounding the pipe to surrounding locations, it appears likely to be disturbed natural as opposed to imported fill. TP12 was located in the vicinity of drainage line and dams, and the pipe is likely to be associated with past water diversions.

There was no litter or rubbish within the excavated soils and the uniformity of soil type suggests that the soils on the site are unlikely to have been disturbed in the past.

Test pit logs are provided in Appendix E.

6.2 Laboratory results

6.2.1 Preliminary analysis

Analytical results tables are provided in Appendix C and analytical laboratory reports are provided in Appendix F. A summary of the analytical results and a comparison against the screening levels where concentrations were reported to exceed criteria is provided in the following table. All other analytes were reported to be below the criteria and are therefore not considered to be of concern.

Table 6.1: Summary of exceeding analytes in soils vs screening levels

Analyte	Concentration Range (mg/kg)	Lowest adopted investigation level (mg/kg)		Samples Exceeding Screening Levels
			No.	Sample IDs
Cobalt	<5 – 460	50 mg/kg (CSQG Remediation Residential/Park Use)	19	TP06-0.1, TP16-0.1, TP17-0.1, TP18-0.1, TP21-0.1, TP22-0.1, TP24-0.1, TP25-0.1, TP26-0.1, TP27-0.1, TP28-0.1, TP29-0.1, TP30-0.1, TP32-0.2, TP33-0.1, TP34-0.1, TP35-0.1, TP39-0.1, TP40-0.1
Manganese	140 – 9,500	3,800 mg/kg (NEPM 2013 HIL Residential A)	5	TP25-0.1, TP26-0.1, TP29-0.2, TP35-0.1, TP37-0.1

As shown above, concentrations exceeding the lowest adopted screening level were reported at:

- 19 locations reporting elevated cobalt concentrations
- 5 locations reporting elevated manganese concentrations

6.2.2 Supplementary analysis

Cobalt and manganese analysis of subsurface samples (0.2 – 0.5 m depth) reported the following concentration ranges:

- Cobalt: <5 – 210 mg/kg
- Manganese: 45 – 5,000 mg/kg

As shown, similarly elevated concentrations were reported in the sub-surface soils compared to the surface concentration range, albeit below previous maximum concentrations reported. Several concentrations of sub-surface soils also exceeded the screening levels.

6.2.3 Leachability

In addition to total soil concentrations, leachability analysis was conducted on select samples for metals (See Table C2). Where screening levels are available (waste soil categorisation limits) concentrations did not exceed the screening levels. Where detectable, the concentrations are considered to represent a negligible fraction of the total metals present within the soils and they are not considered likely to represent a risk of leaching.

The low leachable fractions are considered to be indicative of naturally present metals (i.e. both elements are present as stable carbonate or hydroxide minerals that are not readily bioavailable).

6.3 Discussion

The elevated cobalt and manganese appeared to be strongly correlated and were considered to be naturally occurring. Further discussion on this assessment is provided below.

6.3.1 Distribution

A review of elevated results again mapped geology indicates that almost all elevated cobalt and manganese results were in areas where Older Volcanics basalt is expected at surface.

Soil descriptions provided on the bore logs were compared against mapped geology and generally aligned, with the possible exception of:

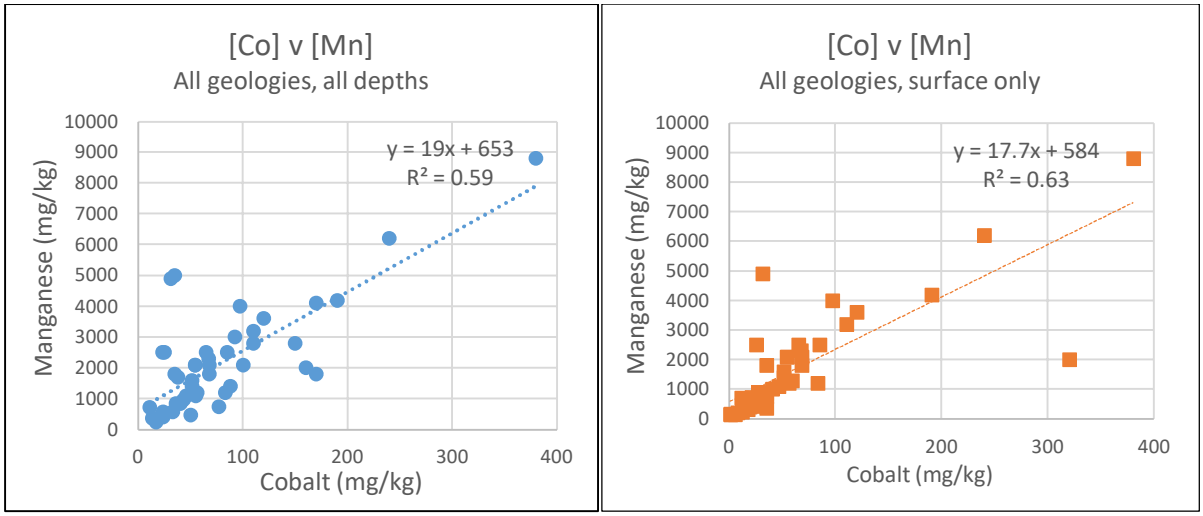
- TP15 – inferred as Dxh from mapping, log description more consistent with Tvo
- TP17, TP21, TP25 – inferred as Tvo from mapping, log description more consistent with Dxh. These locations are all near the inferred transition boundary between the two units, and there may be residual veneer of Tvo overlying Dxh at depth.

Comparison of elevated cobalt results showed only three results, from two locations above the EIL of 50 mg/kg that were not logged (or mapped) as Tvo, including one location, TP06, which recorded the second and fourth highest primary result. The other result was 59 mg/kg at TP18.

Similarly, for manganese no results were above the HIL A for Dxh soils (no EIL is available).

Generally elevated cobalt and manganese concentrations were reported in the same samples and are generally recognised as commonly co-located elements. ASC NEPM provides a method for estimating ABC for a number of metals based on a 'normalising' element – correlating to either iron or manganese background concentrations. The normalising element for cobalt is listed as manganese, with an almost 1:1 relationship.

Plots of cobalt vs manganese concentrations were made for all data (regardless of geology and depth) and for surface samples (regardless of geology). Plots exhibit a reasonable correlation, with slightly better correlation for surface samples.



The observed spatial distribution, presence of elevated concentrations throughout the vertical profile (Section 5.3.3), and correlation between the two elements supports the conclusion that these elements are naturally occurring within volcanic soils at the site and not from diffuse sources such as surface deposition of dusts from nearby industrial activity (i.e. lime kilns) or application of other chemicals or products such as fertilisers or wastewater treatment plant sludge across the site as a whole.

6.3.2 Background concentrations

Further assessment has been made of the potential for cobalt to be naturally elevated using data obtained by others in the vicinity of the site. This is summarised in the following table.

Table 6.2: Comparison of site vs regional cobalt and manganese concentrations

Site	Direction/ distance from site	Cobalt conc. (mg/kg)	Manganese conc. (mg/kg)	Dominant surficial geology	Conclusion in report
Screening levels EIL		*50*	*n/a*		
Screening levels HIL		*100*	*3800*		
Subject site (current investigation)	-	<5 – 460*	140 – 9,800*	Basalt (Tvo), siltstone (Dxh)	-
Subject site (PJRA, 2015)	-	52	1,200 - 1,700	Basalt (Tvo), siltstone (Dxh)	Naturally elevated
Former quarry area and stockpiles (PJRA, 2015)	Adjacent to the east	50 – 150	940 – 2,500	Basalt, siltstone, sandstone, rhyolite	Naturally elevated
Cavehill Limestone Quarry, Hull Road, Lilydale (EPA CARMS# 65516-1, 65516-2)	Adjacent to the south	<5 – 22	<5 – 1,600	Siltstone (Dxh)	Naturally elevated
248-268 Maroondah Hwy, Chirnside Park (EPA CARMS #60428-1)	1,800 m west	<5 - 110	57 - 2,000	Siltstone (Dxh)	Naturally elevated
Part of 238 – 240 Maroondah Highway, Chirnside Park (EPA CARMS #75160-1)	1,800 m west	7 – 93	87 – 487	Siltstone (Dxh)	Naturally elevated

*including QC results

As shown in the above table, naturally elevated cobalt has been detected in soils at other sites in the vicinity, indicating that it is also likely naturally elevated at this site. Basalt at the site extends offsite to the west and north under existing residential areas consistent with the proposed for the site. It is noted that concentrations at the site have been reported as higher than sites in the vicinity (including during previous testing at the site). It is considered likely that this is due to the larger volume of testing (2 – 3 times) that undertaken at other sites and the associated increased probability with identifying maximum concentrations. Of the 49 samples collected, only 5 cobalt concentrations exceeded the range reported at other sites.

7 Assessment of impacts to Beneficial Uses

In order to confirm whether or not beneficial uses of land at the Site are precluded, and if precluded what measures are necessary to restore them, each beneficial use is evaluated with respect to the land setting, the proposed/potential use of the site and the assessment results.

A discussion of the relevant beneficial uses of land to be protected based upon the proposed use of the site is discussed below.

7.1 Maintenance of Natural Ecosystems

The site has undergone clearing of natural vegetation as part of regional historical redevelopment. The site is neither a National Park/Reserve nor non gazetted reserve, and as such Maintenance of Natural Ecosystems is not a beneficial use to be protected at the Site.

7.2 Maintenance of Modified & Highly Modified Ecosystems | Production of Food, Flora and Fibre

The same considerations apply to these beneficial uses and the discussion is therefore applied to all in this subsection.

The proposed land use includes low or medium density residential meaning that exposed soil and garden areas will be present and access is to be expected.

As shown in Table 6.1, elevated cobalt concentrations were reported to exceed EILs in samples at almost half the locations across the site. However, on the basis of the likely natural origin of the identified EIL exceedances as discussed in Section 6.3, it is considered that this beneficial use is protected (noting that EPA considers naturally occurring metals to not be contamination). It is also considered that there is a low potential for impact to water and air environments from the site with low leachability reported for tested samples.

7.3 Human Health

Cobalt and manganese concentrations were reported to exceed the screening levels adopted for the protection of this beneficial use across the site, as follows:

- Cobalt at 13 soil sample locations
- Manganese at 8 soil sample locations

As discussed in Section 6.3, both elements are considered to be naturally elevated in site soils and therefore do not impact upon the beneficial uses of the land. Low leachability and neutral soil pH at the site suggests that these elements are present as complex minerals and not likely to be readily bioavailable.

Calculation of the 95% Upper Confidence Limit of the average for all samples recovered from basaltic soils were less than the HIL for both cobalt and manganese implying that they are present in concentrated nodes within the soil profile, and elevated results are not representative of the soils as a whole. UCL calculations are provided in Appendix C.

No other concentrations were reported to exceed human health screening levels and this beneficial use is considered to be protected, noting that other residential areas are already developed on the same soil types to the immediate west and north of the site.

7.4 Buildings and Structures

The site is not located in an area of likely corrosive geological conditions and there were no likely sources of corrosive contaminants previously at the site.

Limited soil pH results were not in the range likely to result in corrosive conditions (i.e., range of 7.3 – 7.4), based on criteria provided in AS 2159 (2009) Piling Design and Installation and ASC NEPM.

On this basis, Buildings and Structures are considered to be protected at the site in terms of the chemical condition of soils.

7.5 Aesthetics

In order to assess the site in terms of the beneficial use aesthetics, field observations relating to odours, staining and the presence of wastes were recorded.

Odours were not observed during the site and volatile screening using a PID identified that soils were unlikely to contain elevated volatile concentrations (and are therefore unlikely to be odorous). Furthermore, targeted hydrocarbon analysis did not identify any detectable concentrations.

No staining likely to impact upon this beneficial use was observed at the site.

Wastes were not identified in site soils sufficient to render the beneficial use 'Aesthetics' impacted.

7.6 Summary of beneficial use considerations

Current soil chemical data has not identified contamination that would preclude the site from the beneficial uses associated with current or proposed use.

7.7 Consideration of Environmental Audit requirement

The requirement for an Environmental Audit to be completed in accordance with the Environment Protection Act (1970) has been considered with reference to the 'Planning Practice Note PPN30: Potentially Contaminated Land' (June 2005). PPN30 includes an assessment matrix for use as a guideline for the determination of the appropriate way forward in consideration of potential for contamination vs. proposed land use. The assessment matrix (Table 2 of the PPN30) is reproduced as follows:

Table 7.1: Assessment matrix

Proposed Land-Use	Potential for Contamination		
	High	Medium	Low
Sensitive uses			
Child care centre, pre-school or primary school	A	B	C
Dwellings, residential buildings etc.	A	B	C
Other uses			
Open space	B	C	C
Agriculture	B	C	C
Retail or office	B	C	C
Industry or warehouse	B	C	C

A: Require an environmental audit as required by Ministerial Direction No. 1 or the Environmental Audit Overlay when a planning scheme amendment or planning permit application would allow a sensitive use to establish on potentially

contaminated land. An environmental audit is also strongly recommended by the SEPP where a planning permit application would allow a sensitive use to be established on land with 'high potential' for contamination.

B: Require a site assessment from a suitably qualified environmental professional if insufficient information is available to determine if an audit is appropriate. If advised that an audit is not required, default to C.

C: General duty under Section 12(2)(b) and Section 60(1)(a)(iii) of the Planning and Environment Act 1987.

As detailed within this report, the site is currently vacant and was formerly used as paddocks. Potentially contaminating activities are not likely to have occurred onsite and soil testing has confirmed that soils are suitable for 'sensitive use. It is therefore considered that the site has a low potential for contamination and that designation 'C' applies and an environmental audit should not be required.

7.8 Updated Conceptual Site Model

The site is vacant paddocks historically used for grazing as part of buffer land between the limestone quarry to the east and residential area to the west. There is evidence of minor filling at the site however it appears filling material was local natural soil.

Natural soils at the site consist of clays (likely silty clays/clayey silts). Groundwater dewatering is being undertaken to prevent inflow into the adjacent former quarry and is likely to be 50 – 70m below ground level.

The site is being considered for redevelopment including sensitive uses and exposure to site soils may occur to:

1 construction personnel and future occupants through direct contact with soils (such as construction work or gardening), ingestion of soils (e.g., consumption of homegrown food) and inhalation of dust or volatile compounds within soils (e.g., during exposure of soils during construction or within onsite buildings through vapour intrusion)

2 ecosystems such as plants established in site soils

Investigations at the site have confirmed that it is unlikely that contamination is present (including sources of contamination or contamination within site soils) which could result in impacts to future occupants or ecosystems. Therefore, whilst exposure to site soils will likely occur during future development and occupancy, it is considered that there are no sources, and therefore no unacceptable risks.

8 Quality Control

During the sampling works, T+T implemented a quality assurance and quality control (QA/QC) program based on Australian Standards AS4482.1 (2005). The program included:

- Implementation of T+T field procedures including use of dedicated sampling equipment for each sampling location;
- Decontamination of reusable sampling equipment;
- Appropriate sampling handling and analysis within sample holding times;
- The collection and analysis of quality control samples including a blind and split duplicate sample to evaluate the laboratories' accuracy and precision;
- Transportation of samples with accompanying COC documentation; and
- Review of laboratory internal quality control results.

8.1 Field QC sampling program

The QC sampling program conducted as part of this investigation involved collection of replicate samples for data reliability purposes, assessing possible errors due to potential sources of cross contamination, inconsistencies in sampling, and analytical techniques etc.

A quantitative measure of the accuracy of the results obtained was undertaken by calculating the RPD values for each duplicate pair. The RPD values were calculated using the following equation:

$$\text{Relative Percent Difference} = \frac{\text{Result 1} - \text{Result 2}}{\text{Mean Result}} \times 100$$

Where, Result 1 = concentration obtained from the original sample
Result 2 = concentration obtained from the split or duplicate sample

The RPD was used to normalise each pair of results, allowing data interpretation of reliability. For RPD values that exceed a generally accepted 50% limit (AS 4482.1 – 2005), correlation of data between the sample pair is considered poor.

8.1.1 Replicate Sampling

QC samples collected as part of the soil assessment included replicate samples. The primary laboratory was Eurofins and the secondary laboratory was ALS. Three QC samples, QC01, QC02 and QC03 were collected during the works as blind replicates to assess the laboratory's analytical precision. Following analysis by Eurofins, samples QC02 and QC03 were forwarded to a second laboratory to assess the analytical accuracy of the primary laboratory. Metals and OCPs were the replicated analysis and there are no sample preservation or handling concerns with the replication method, with the samples forwarded and analysed within applicable holding times for the analytes.

Soil QC analytical program is summarised in Table 8.1.

Table 8.1: QC sampling program

Sample ID	Primary sample ID	Date sampled	Analysed by	Analysis
QC01	TP07-0.1	24/09/2019	Eurofins	Metals, OCPs
QC02	TP24-0.1	25/09/2019	Eurofins and ALS	Metals, OCPs
QC03	TP41-0.1	25/09/2019	Eurofins and ALS	Metals, OCPs

The results of the RPD analysis between the primary sample and blind and split duplicates reported three of the calculated RPDs to exceed the adopted acceptance range provided in ASC NEPM (+/- 30%). RPDs for soil assessment replicates are provided in Table C3 and elevated RPDs are summarised in Table 8.2.

Table 8.2: Elevated RPD Summary

Sample		Analyte	Concentration (mg/kg)		RPD
Primary	Secondary		Primary	Secondary	
Blind Replicate					
TP24_0.1	QC02	Cobalt	68	460	148
		Manganese	1,800	9,500	136
		Nickel	62	170	93
Split					
TP24_0.1	QC02	Cobalt	68	43	45
TP41_0.1	QC03	Cobalt	11	8	32

The identified metals concentrations are likely to be associated with natural mineralisation within site soils. The variance reported within one blind replicate sample is considered to be an indication that the mineralisation is heterogeneous throughout the soil matrix (potentially more associated with a particular material within the soil matrix, which may have been sampled and subsampled to varying degrees. The split sample results (and other blind duplicates) showed better correlation, supporting accuracy and precision of the primary laboratory's processes. On the basis that the identified variance is considered to be a natural feature of the site soils, T+T considers the overall dataset to be of acceptable quality.

Laboratory analytical reports for the soil assessment are provided in Appendix I.

8.1.2 Trip and rinsate blank sampling

Trip and rinsate samples were analysed for BTEXN which were included for analysis in targeted sampling locations and were considered analytes at highest risk of being detected through cross-contamination (volatile and soluble). Results were reported to be below the limit of reporting.

Blank sample results are provided in Table B4 (Appendix B).

8.2 Compliance with recommended holding-times

All sample analysis was completed in appropriate holding times.

8.3 Conclusions of QA/QC program

Based on the results of the QA/QC program as detailed above, the following is concluded:

- The field sampling procedure was carried out in accordance with the T+T QA/QC program;
- Laboratories used were NATA accredited for the analyses performed (where accreditation exists);
- Samples were appropriately transported to the laboratory and were analysed within the applicable holding times;
- RPD results were of an acceptable level with exceedances attributed to the natural condition of site soils.

9 Summary and Conclusions

T+T was commissioned by Hume Lilydale Pty Ltd and LBJ Corporation Pty Ltd to complete an Environmental Site Assessment for the site at 4 Melba Avenue, Lilydale.

The site is being considered for development including sensitive uses such as 'standard' residential use including garden spaces.

The site is currently unoccupied and has most recently been used for grazier-based agricultural activities. No contaminating activities have been identified at the site and two prior site history investigations by others had both concluded that the site has a low potential for contamination, a conclusion supported by T+T.

A grid and targeted investigation of the site soils was undertaken. Historical importation of fill does not appear to have been undertaken at the site and in the two instances where fill was identified it was classified as disturbed natural originating from the site. No significant wastes, staining or odours were identified in site surface soils.

Natural surface soils were determined to contain elevated concentrations of cobalt and manganese, associated in particular with the Older Volcanics geology that occurs across the southern two thirds of the site. Concentrations were reported to exceed screening levels adopted for the protection of ecosystems and human health. However, the elevated concentrations are concluded to be naturally occurring in the site soils and are not considered to impact upon the site beneficial uses, noting that low density residential development similar to that proposed for the site, occurs on the same geology immediately to the west and north.

On the basis of the assessment, in particular the determination of low potential for contaminating activities to have occurred and low potential for soil contamination to be present, it is considered that the site designation 'C' per the Planning Practice Note 30 applies, and an environmental audit should not be required.

10 Applicability

This report has been prepared for the exclusive use of our client Hume Lilydale Pty Ltd & LBJ Corporation Pty Ltd, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

Tonkin & Taylor Pty Ltd

Report prepared by:	Authorised for Tonkin & Taylor Pty Ltd by:
	
.....	.....
Rhian Owen	Tim Vass
Associate Environmental Scientist	Project Director

FOT
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Appendix A: Accepted scope of works proposal

Tonkin+Taylor

Job No: 1000511.L43v4
28 June 2019

Hume Lilydale Pty Ltd & LBJ Corporation Pty Ltd
c/o Intrapac Property Pty Ltd
Level 6, 580 St Kilda Road
Melbourne VIC 3006

Attention: Anthony Jansen

Dear Anthony

Kinley Estate Western Area - Environmental Assessment Work Plan

Please find attached the updated proposed assessment work plan for the Western Area of land at Kinley Estate for submission to Council, following review of the prior (16 April 2019) version and recommendation for additional testing density.

Please contact Rhian Owen or the undersigned if there are any further questions or clarifications required.

Yours sincerely

Tim Vass

Project Director

29-Jun-19
\\ttgroup.local\corporate\south melbourne\projects\1000511\workingmaterial\letter reports\1000511.l43v4.docx

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Attachment 1 Work plan

Kinley Estate Western Area - Environmental Assessment Work Plan

Introduction

Hume Lilydale Pty Ltd & LBJ Corporation Pty Ltd has engaged Tonkin & Taylor Pty Ltd (T+T) to prepare a work plan for further environmental assessment works for the western portion of the site within the planned Kinley Estate. It is noted that the southern part of the western area was included in a previous environmental audit for 'Stage 1'[1] and has therefore not been considered within this workplan. The site location and investigation area is shown on Figure 1.

This work has been prepared in response to the outcomes of the combined workshop on 8 February 2019, Yarra Ranges Council's letters dated 15th March 2019 and 18 June 2019 and T+T's letter of 18 February 2019 in order to:

- Provide Council and EPA with additional evidence that the land has not been contaminated by extending previously provided studies, conclusions and recommendations in respect to a determination regarding the contamination status of the land as presented in the following reports:
  - *Phase 1 Environmental Site Assessment, Lilydale Quarry, Melba Avenue, Lilydale, Victoria*, June 2015, Prensa Pty Ltd, and
  - *Preliminary Site Investigation Cave Hill Limestone Quarry, 4 Melba Avenue, Lilydale, Victoria,* September 2015, Peter J Ramsay & Associates Pty Ltd (PJRA)
- To present a scope for a "limited additional soil sampling site program" for agreement with Council and EPA that assesses the contamination status of Precinct 2 and provides sufficient information to support the decisions for the area not being included in the EAO.

Details of the western portion, including the boundary, history and data obtained to date are provided in the T+T letter *'Kinley Estate Western Area - Environmental Assessment Summary and Condition of Land'* dated 18 February 2019. This work plan has been prepared on the basis of the information from the summary letter.

Conceptual Site Model

A preliminary Conceptual Site Model (CSM) based on the current understanding of the site is provided as follows:

- It appears that potentially contaminating activities are likely restricted to historical agricultural use (potentially involving pesticide application). Areas of specific use are shown on Figure 2.
- The site is currently vacant and has not been subject to any active use for at least 4 years;
- The site is proposed for residential use and historically caused contamination may impact upon future workers and occupants.

The CSM will be updated as data is obtained from the site.

Work Plan

Objective

T+T propose to conduct a supplementary environmental investigation of the western area to collect data to determine whether there are any likely unacceptable risks to potential future users of the site. Quantitative chemical data will be collected relating to surface soil and qualitative data will be collected relating to whether aesthetic impacts are present, or likely to be present.

[1] Parsons Brinkerhoff (2010) *Environmental Audit Report Cavehill Quarry, Hull Road, Lilydale, Victoria* (CARMS#65516-1)

Guidelines

The works proposed have been designed in consideration of the following guidelines:

- Australia Standard AS4482.1, Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil, Part 1: Non-volatile and Semi-volatile compounds (2005)
- Australia Standard AS 4482.2, Guide to the Sampling and Investigation of Potentially Contaminated Soil, Part 2: Volatile Substances (1999)
- EPA Victoria, IWRG, Sampling and Analysis of Waters, Wastewaters, Soils and Wastes, Publication 701, (June 2009)
- National Environment Protection (Assessment of Site Contamination) Measure 1999 (2013 amendment) ('ASC NEPM')

Scope of Works

The following additional environmental assessment works are proposed in consideration of the current understanding of the site, and also factoring the findings of low potential for contamination (as detailed in the 18 February 2019 letter):

1. Undertake soil sampling using a backhoe to complete test-pits/trenches for:
   - Sampling at up to 40 locations across the site to a maximum depth of 1.0m or to the depth of natural soil.
   - target surface sampling at 3 locations within the drainage lines
   - target surface sampling within 2 former onsite dams
   - target surface sampling at 1 location within the former cattle yard

   It is not proposed, nor is it considered necessary to conduct a grid based sampling program consistent with AS4482.1-2005 for the purposes of identifying any hot spots of contamination, as there is no indication of any such sources/hot spots likely to be on site. Accordingly, T+T had proposed a limited number of 10 'screening' locations across the site primarily to provide an overview of likely natural conditions across the site, and possibly application of pesticides. Council, supported by EPA, has requested testing locations to be increased to 40, which we understand to reflect a density of approximately one sampling location per Ha of the site.

   Figure 3 sets out a proposed grid sampling program based on one sample per Ha. Accessibility and practicability of sampling at the nominal 42 marked locations will be confirmed in the field.

2. The soil sampling works shall include:
   - pre-commencement safety briefing;
   - underground service location, where required based on review of DBYD information;
   - soil logging by a qualified engineer or scientist;
   - photo-ionisation detector (PID) logging;
   - collection of samples into laboratory prepared sampled jars;
   - transport of samples in chilled containers to the laboratories with accompanying chain of custody documentation
   - analysis of samples for chemical analysis as nominated in Table 1 (based on the contaminants of concern as identified in the 18 February 2019 letter and also to obtain information on a broad selection of typical analytes);
   - analysis of Quality Control (QC) samples at a rate of one split and duplicate, one trip blank and one decontamination rinsate sample.

3. Compilation of a report detailing assessment findings of the current condition of soil at the site in relation to the site's proposed land use.

Table 1 Nominated Analytical Schedule

Soil Sample Analysis Type - Grid	**No. Of Sample Analyses**
%Fe, Cation Exchange Capacity, %Clay, Total Organic Carbon	3
Metals screen[2], OCPs	40
Soil Sample Analysis Type - Target	
Drainage lines - Metals screen, OCPs	3
Dams - 'IWRG 621' screen[3]	2
Cattle yard – Metals screen, OCPs	1
Soil Sample Analysis Type - QC	
Metals screen, OCPs	4

In relation to the proposed testing schedule, Table 1:

- No specific contaminating activities have been identified across the site and no specific contaminants of concern are identified. The testing program for the 'grid' samples has therefore been limited to metals and OCPs, as the most likely residual contaminants associated with any past agricultural practices (which we understand has been limited to grazing).
- Organophosphorus pesticides, which had previously been identified as a COPC by Ramsay (2015) were not included in the proposed testing suite as these contaminants were not identified above the limit of reporting in subsequent sampling and analytical works. These compounds typically also have short half life (weeks to months) in comparison to OCPs, and are therefore not expected to be present, considering the site has been disused for at least 4 years.
- Metals and OCPs have been selected as the main target compounds of interest along drainage lines and in the cattle yards (where pesticide sprays may have been used).
- A broad contaminant suite has been adopted for the former dam area in the event that any soils have been imported to these locations.
- %Fe, CEC, %Clay, TOC are to be analysed to allow for calculation of site specific Ecological Investigation Levels, in accordance with the ASC NEPM.

Should sources of potential contamination be identified during the field program (e.g. unexpected areas of filling, or odorous or stained soils), the analytical program will be augmented to assess potential for unknown contaminants as required.

As outlined in our letter of 18 February, and Council's letter of 15 March, this Sampling Plan has focussed on providing a scope for "limited additional soil investigations" for the site. No groundwater investigation has been proposed based on:

[2] As,Be,B,Cd,Co,Cu,Hg,Pb,Ni,Mn,Se,Zn, Cr6+

[3] TPH, VOC, Vinyl Chloride, PAH, Phenols, OCP, PCB, Cr^{6+}, Metals (As,Cd,Cr,Cu,Ni,Pb,Zn,Hg,Ag,Sn,Mo,Se), Cyanide, Total Fluoride

- The absence of any likely sources of groundwater contamination, with reference to EPA Publication 759 (where groundwater is unlikely to be polluted, it does not need to be investigated);
- The likely depth to groundwater, due to significant drawdown for historical quarry dewatering; and
- Noting that no investigation of groundwater was completed for Audit of Stage 1 (boreholes were drilled for geotechnical purposes to depths of at least 20 m below ground level, and in the absence of groundwater at those depths, and source of contamination, no further sampling or investigation works were required).

Similarly, no landfill gas or soil vapour investigations are proposed or considered necessary (other than field PID screening) in the absence of any identified landfills within 500 m of the site or other source of volatile contaminants. No vapour investigations were completed for the Stage 1 Audit.

Attachments

Figures

Figure 1 – Site Location Plan
Figure 2 – Historical Features Location Plan
Figure 3 – Proposed Soil Sample Location Plan

Figures

LEGEND

BOUNDARY OF INVESTIGATION AREA

AERIAL PHOTOGRAPH SOURCED FROM NEARMAP. COPYRIGHT NEARMAP PTY LTD
IMAGERY DATE: 23/02/2019.

A3 SCALE 1:7500

0 0.1 0.2 0.3 0.4 (km)

ORIGINAL IN COLOUR

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PROJECT No.	1000511	
DESIGNED		
DRAWN	KMJA	Mar.19
CHECKED		
APPROVED	DATE	

CLIENT HUME LILYDALE PTY LTD & LBJ CORPORATION PTY LTD

PROJECT ENVIRONMENTAL ASSESSMENT SUMMARY AND CONDITION OF LAND

TITLE KINLEY ESTATE WESTERN AREA
SITE LOCATION PLAN

UNDER REVISION 1

SCALE (A3) 1:7500 FIG No. FIGURE 1 REV 1

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PROJECT No.	1000511	
DESIGNED		
DRAWN	KMJA	Mar.19
CHECKED		
APPROVED	DATE	

CLIENT HUME LILYDALE PTY LTD & LBJ CORPORATION PTY LTD

PROJECT ENVIRONMENTAL ASSESSMENT SUMMARY AND CONDITION OF LAND

TITLE KINLEY ESTATE WESTERN AREA
HISTORICAL FEATURES LOCATION PLAN

UNDER REVISION 1

SCALE (A3) 1:5000 FIG No. FIGURE 2 REV 1

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PROJECT No.	1000511	
DESIGNED	TV	June.19
DRAWN	TKEL	June.19
CHECKED		
APPROVED	DATE	

CLIENT HUME LILYDALE PTY LTD & LBJ CORPORATION PTY LTD

PROJECT ENVIRONMENTAL ASSESSMENT SUMMARY AND CONDITION OF LAND

TITLE KINLEY ESTATE WESTERN AREA
PROPOSED SOIL SAMPLE LOCATION PLAN

SCALE (A3) 1:5000 FIG No. FIGURE 3 REV 1

Appendix B: Figures

LEGEND

SITE INVESTIGATION AREA

STREET MAP SOURCED FROM NEARMAP. COPYRIGHT NEARMAP PTY LTD

.

A3 SCALE 1:12500

0 0.25 0.5 0.75 (km)

ORIGINAL IN COLOUR

Tonkin+Taylor

Exceptional thinking together www.tonkintaylor.com.au

PROJECT No.	1000511	
DESIGNED		
DRAWN	RBS	Nov.19
CHECKED		
APPROVED	DATE	

CLIENT HUME LILYDALE PTY LTD & LBJ CORPORATION PTY LTD

PROJECT ENVIRONMENTAL ASSESSMENT SUMMARY AND CONDITION OF LAND

TITLE KINLEY ESTATE WESTERN AREA
SITE LOCALITY PLAN

UNDER REVISION 1

SCALE (A3) 1:12,500 FIG No. FIGURE 1 REV 1

LEGEND

BOUNDARY OF INVESTIGATION AREA

AERIAL PHOTOGRAPH SOURCED FROM NEARMAP. COPYRIGHT NEARMAP PTY LTD
IMAGERY DATE: 23/02/2019.

A3 SCALE 1:7500

0 0.1 0.2 0.3 0.4 (km)

ORIGINAL IN COLOUR

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PROJECT No.	1000511	
DESIGNED		
DRAWN	KMJA	Mar.19
CHECKED		
APPROVED	DATE	

CLIENT HUME LILYDALE PTY LTD & LBJ CORPORATION PTY LTD

PROJECT ENVIRONMENTAL ASSESSMENT SUMMARY AND CONDITION OF LAND

TITLE KINLEY ESTATE WESTERN AREA
SITE LOCATION PLAN

UNDER REVISION 1

SCALE (A3) 1:7500 FIG No. FIGURE 2 REV 1

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PROJECT No.	1000511	
DESIGNED		
DRAWN	KMJA	Mar.19
CHECKED		
APPROVED	DATE	

CLIENT HUME LILYDALE PTY LTD & LBJ CORPORATION PTY LTD

PROJECT ENVIRONMENTAL ASSESSMENT SUMMARY AND CONDITION OF LAND

TITLE KINLEY ESTATE WESTERN AREA
HISTORICAL FEATURES LOCATION PLAN

UNDER REVISION 1

SCALE (A3) 1:5000 FIG No. FIGURE 3 REV 1

T:\South Melbourne\Projects\1000511\ENV Environmental and contaminated land\Working\Material\CAD\FIG\1000511-F04.dwg 2019-Nov-13 9:03:32 AM Plotted By: ROSEMARY SUTTON

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PROJECT No.	1000511	
DESIGNED	TV	June.19
DRAWN	TKEL	June.19
CHECKED		
APPROVED	DATE	

CLIENT HUME LILYDALE PTY LTD & LBJ CORPORATION PTY LTD

PROJECT ENVIRONMENTAL ASSESSMENT SUMMARY AND CONDITION OF LAND

TITLE KINLEY ESTATE WESTERN AREA
SOIL SAMPLE LOCATION PLAN

SCALE (A3) 1:5000 FIG No. FIGURE 4 REV 1

Appendix C: Analytical Results Tables

Table C1: Laboratory results

Hume Lilydale Pty Ltd LBJ Corporation Pty Ltd,
Kinley Estate Western Area,
1000511

				CSQG Interim Remediation Residential/ Park Use	CSQG Residential/Parkland Use	NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil	NEPM 2013 Table 1B EILs for Urban Res/Public Open Space	*NEPM 2013 Table 1A(1) HILs Res A Soil*	NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand (0-1m)	NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil																
Field_ID											CAT 1	DRAIN 1	DRAIN 2	DRAIN 3	TP01-0.1	TP01-0.3	TP02-0.1	TP03-0.1	TP04-0.1	TP05-0.1	TP05-0.3	TP06-0.1	TP06-0.3	TP07-0.1	QC01	TP08_0.1
Sampled_Date-Time											25/09/2019	25/09/2019	25/09/2019	25/09/2019	24/09/2019	24/09/2019	24/09/2019	24/09/2019	24/09/2019	24/09/2019	24/09/2019	24/09/2019	24/09/2019	24/09/2019	24/09/2019	25/09/2019
Lab_Report_Number											679599	679599	679599	679599	679598	689100	679598	679598	679598	679598	689100	679598	689100	679598	679598	679599
Method_Type	**ChemName**	**Units**	**EQL**																							
Metals/ Metalloids	Arsenic	mg/kg	2				100	*100*			<2	2.1	2.6	2.8	<2	-	<2	5.6	<2	<2	-	4.3	-	2.9	2.9	<2
	Beryllium	mg/kg	2	4				*60*			2.1	<2	<2	<2	<2	-	2.6	<2	<2	<2	-	2.9	-	<2	<2	<2
	Boron	mg/kg	10					*4500*			<10	<10	<10	<10	<10	-	<10	<10	<10	<10	-	<10	-	<10	<10	<10
	Cadmium	mg/kg	0.4		10			*20*			<0.4	<0.4	<0.4	<0.4	<0.4	-	<0.4	<0.4	<0.4	<0.4	-	<0.4	-	<0.4	<0.4	<0.4
	Chromium (III+VI)	mg/kg	5				400				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chromium (hexavalent)	mg/kg	1		0.4			*100*			<1	<1	<1	<1	<1	-	<1	<1	<1	<1	-	<1	-	<1	<1	<1
	Cobalt	mg/kg	5	50				*100*			35	27	23	17	<5	< 5	35	19	13	5.2	< 5	*320*	*210*	7.7	8.2	30
	Copper	mg/kg	5				230	*6000*			75	29	33	20	11	-	52	30	16	15	-	59	-	8.9	9.8	48
	Iron	mg/kg	20								-	-	-	-	-	-	120,000	-	-	-	-	-	-	-	-	-
	Iron (%)	%	0.01								-	-	-	-	-	-	12	-	-	-	-	-	-	-	-	-
	Lead	mg/kg	5				1100	*300*			20	19	75	24	14	-	11	130	23	20	-	21	-	20	21	16
	Manganese	mg/kg	5					*3800*			850	900	420	310	170	92	370	400	410	140	45	2000	930	200	210	690
	Mercury	mg/kg	0.1		6.6			*40*			<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	<0.1
	Molybdenum	mg/kg	5	10							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Nickel	mg/kg	5				380	*400*			62	55	40	26	11	-	72	44	21	11	-	100	-	12	11	55
	Selenium	mg/kg	2		1			*200*			<2	<2	<2	<2	<2	-	<2	<2	<2	<2	-	<2	-	<2	<2	<2
	Silver	mg/kg	0.2	20							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Tin	mg/kg	10	50							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Zinc	mg/kg	5				850	*7400*			75	40	100	280	12	-	38	110	20	17	-	93	-	20	21	46
General	% Clay	%	1								-	-	-	-	-	-	25	-	-	-	-	-	-	-	-	-
	Cation Exchange Capacity	meq/100g									-	-	-	-	-	-	23	-	-	-	-	-	-	-	-	-
	Cyanide Total	mg/kg	5								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluoride	mg/kg	100	400							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Moisture Content (dried @ 103°C)	%	1								27	29	34	27	21	-	30	38	27	26	-	27	-	28	32	32
	Total Organic Carbon	%	1								-	-	-	-	-	-	4.1	-	-	-	-	-	-	-	-	-
	Conductivity	uS/cm	10								-	-	-	-	-	-	160	-	-	-	-	-	-	-	-	-
	pH (aqueous extract)	pH_Units	0.1								-	-	-	-	-	-	6.1	-	-	-	-	-	-	-	-	-
OCP	4,4-DDE	mg/kg	0.05								<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05
	a-BHC	mg/kg	0.05								<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05
	Aldrin	mg/kg	0.05								<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05
	Aldrin + Dieldrin	mg/kg	0.05					*6*			<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05
	b-BHC	mg/kg	0.05								<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05
	chlordane	mg/kg	0.1					*50*			<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	<0.1
	d-BHC	mg/kg	0.05								<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05
	DDD	mg/kg	0.05								<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05
	DDT	mg/kg	0.05				180				<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05
	DDT+DDE+DDD	mg/kg	0.05					*240*			<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05
	Dieldrin	mg/kg	0.05								<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05
	Endosulfan I	mg/kg	0.05								<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05
	Endosulfan II	mg/kg	0.05								<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05
	Endosulfan sulphate	mg/kg	0.05								<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05
	Endrin	mg/kg	0.05					*10*			<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05
	Endrin aldehyde	mg/kg	0.05								<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05
	Endrin ketone	mg/kg	0.05								<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05
	g-BHC (Lindane)	mg/kg	0.05								<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05
	Heptachlor	mg/kg	0.05					*6*			<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05
	Heptachlor epoxide	mg/kg	0.05								<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05
	Hexachlorobenzene	mg/kg	0.05	2				*10*			<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05
	Methoxychlor	mg/kg	0.05					*300*			<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05
	Toxaphene	mg/kg	1					*20*			<1	<1	<1	<1	<1	-	<1	<1	<1	<1	-	<1	-	<1	<1	<1

Table C1: Laboratory results

Hume Lilydale Pty Ltd LBJ Corporation Pty Ltd,
Kinley Estate Western Area,
1000511

				CSQG Interim Remediation Residential/ Park Use	CSQG Residential/Parkland Use	NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil	NEPM 2013 Table 1B EILs for Urban Res/Public Open Space	***NEPM 2013 Table 1A(1) HILs Res A Soil***	**NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand (0-1m)**	NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil																
Field_ID											TP09-0.1	TP09-0.3	TP09-0.5	TP10_0.1	TP11_0.1	TP12-0.1	TP13-0.1	TP14-0.1	TP15-0.1	TP16-0.1	TP16-0.3	TP16-0.5	TP17-0.1	TP17-0.3	TP18-0.1	TP18-0.4
Sampled_Date-Time											24/09/2019	24/09/2019	24/09/2019	25/09/2019	25/09/2019	24/09/2019	24/09/2019	24/09/2019	24/09/2019	24/09/2019	24/09/2019	24/09/2019	24/09/2019	24/09/2019	24/09/2019	24/09/2019
Lab_Report_Number											679598	689100	689100	679599	679599	679598	679598	679598	679598	679598	689100	689100	679598	689100	679598	689100
Method_Type	**ChemName**	**Units**	**EQL**																								
Metals/ Metalloids	Arsenic	mg/kg	2				100	*100*			<2	-	-	<2	<2	<2	<2	<2	2.5	2.3	-	-	2.4	-	2.3	-
	Beryllium	mg/kg	2	4				*60*			<2	-	-	<2	2.2	<2	<2	<2	<2	<2	-	-	<2	-	<2	-
	Boron	mg/kg	10					*4500*			<10	-	-	<10	<10	<10	<10	<10	<10	<10	-	-	<10	-	<10	-
	Cadmium	mg/kg	0.4		10			*20*			<0.4	-	-	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	-	-	<0.4	-	<0.4	-
	Chromium (III+VI)	mg/kg	5				400				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chromium (hexavalent)	mg/kg	1		0.4			*100*			<1	-	-	<1	<1	<1	<1	<1	<1	<1	-	-	<1	-	<1	-
	Cobalt	mg/kg	5	50				*100*			12	30	67	35	40	12	<5	32	21	56	50	77	*120*	22	59	32
	Copper	mg/kg	5				230	*6000*			24	-	-	50	75	25	8.9	30	33	53	-	-	40	-	30	-
	Iron	mg/kg	20								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Iron (%)	%	0.01								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lead	mg/kg	5				1100	*300*			23	-	-	17	20	28	14	16	28	15	-	-	17	-	18	-
	Manganese	mg/kg	5					*3800*			440	1600	490	750	1000	220	140	820	730	1200	470	730	3600	420	1300	230
	Mercury	mg/kg	0.1		6.6			*40*			<0.1	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	-	<0.1	-
	Molybdenum	mg/kg	5	10							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Nickel	mg/kg	5				380	*400*			25	-	-	56	62	31	10	52	45	86	-	-	94	-	62	-
	Selenium	mg/kg	2		1			*200*			<2	-	-	<2	<2	<2	<2	<2	<2	<2	-	-	<2	-	<2	-
	Silver	mg/kg	0.2	20							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Tin	mg/kg	10	50							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Zinc	mg/kg	5				850	*7400*			24	-	-	69	78	36	15	33	48	48	-	-	45	-	38	-
General	% Clay	%	1								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cation Exchange Capacity	meq/100g									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cyanide Total	mg/kg	5								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluoride	mg/kg	100	400							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Moisture Content (dried @ 103°C)	%	1								31	-	-	30	26	32	35	29	36	24	-	-	28	-	28	-
	Total Organic Carbon	%	1								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Conductivity	uS/cm	10								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	pH (aqueous extract)	pH_Units	0.1								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OCP	4,4-DDE	mg/kg	0.05								<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	a-BHC	mg/kg	0.05								<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	Aldrin	mg/kg	0.05								<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	Aldrin + Dieldrin	mg/kg	0.05					*6*			<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	b-BHC	mg/kg	0.05								<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	chlordane	mg/kg	0.1					*50*			<0.1	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	-	<0.1	-
	d-BHC	mg/kg	0.05								<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	DDD	mg/kg	0.05								<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	DDT	mg/kg	0.05				180				<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	DDT+DDE+DDD	mg/kg	0.05					*240*			<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	Dieldrin	mg/kg	0.05								<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	Endosulfan I	mg/kg	0.05								<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	Endosulfan II	mg/kg	0.05								<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	Endosulfan sulphate	mg/kg	0.05								<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	Endrin	mg/kg	0.05					*10*			<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	Endrin aldehyde	mg/kg	0.05								<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	Endrin ketone	mg/kg	0.05								<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	g-BHC (Lindane)	mg/kg	0.05								<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	Heptachlor	mg/kg	0.05					*6*			<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	Heptachlor epoxide	mg/kg	0.05								<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	Hexachlorobenzene	mg/kg	0.05	2				*10*			<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	Methoxychlor	mg/kg	0.05					*300*			<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	Toxaphene	mg/kg	1					*20*			<1	-	-	<1	<1	<1	<1	<1	<1	<1	-	-	<1	-	<1	-

Table C1: Laboratory results

Hume Lilydale Pty Ltd LBJ Corporation Pty Ltd,
Kinley Estate Western Area,
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				CSQG Interim Remediation Residential/ Park Use	CSQG Residential/Parkland Use	NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil	NEPM 2013 Table 1B EILs for Urban Res/Public Open Space	***NEPM 2013 Table 1A(1) HILs Res A Soil***	**NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand (0-1m)**	NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil	**Field_ID**	TP19_0.1	TP20_0.1	TP20-0.5	TP21-0.1	TP21-0.5	TP22-0.1	TP22-0.5	TP23-0.1	TP24_0.1	QC02	TP24-0.3	TP24-0.5 (0.6)	TP25_0.1	TP25-0.5	TP26_0.1	TP26-0.3 (0.2)
											Sampled_Date-Time	25/09/2019	25/09/2019	25/09/2019	24/09/2019	24/09/2019	24/09/2019	24/09/2019	24/09/2019	25/09/2019	25/09/2019	25/09/2019	25/09/2019	25/09/2019	25/09/2019	25/09/2019	25/09/2019
											Lab_Report_Number	679599	679599	689100	679598	689100	679598	689100	679598	679599	679599	689100	689100	679599	689100	679599	689100
Method_Type	**ChemName**	**Units**	**EQL**																									
Metals/ Metalloids	Arsenic	mg/kg	2				100	*100*				<2	<2	-	2.2	-	<2	-	<2	<2	<2	-	-	<2	-	2.6	-
	Beryllium	mg/kg	2	4				*60*				<2	<2	-	<2	-	<2	-	<2	<2	<2	-	-	<2	-	2.2	-
	Boron	mg/kg	10					*4500*				<10	<10	-	<10	-	<10	-	<10	<10	<10	-	-	<10	-	<10	-
	Cadmium	mg/kg	0.4		10			*20*				<0.4	<0.4	-	<0.4	-	<0.4	-	<0.4	<0.4	<0.4	-	-	<0.4	-	1	-
	Chromium (III+VI)	mg/kg	5				400					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chromium (hexavalent)	mg/kg	1		0.4			*100*				<1	<1	-	<1	-	<1	-	<1	<1	<1	-	-	<1	-	<1	-
	Cobalt	mg/kg	5	50				*100*				<5	33	23	*110*	20	85	24	24	68	*460*	33	17	97	*150*	*380*	92
	Copper	mg/kg	5				230	*6000*				13	33	-	58	-	56	-	30	36	43	-	-	29	-	62	-
	Iron	mg/kg	20									-	-	-	-	-	-	-	-	48,000	-	-	-	-	-	-	-
	Iron (%)	%	0.01									-	-	-	-	-	-	-	-	4.8	-	-	-	-	-	-	-
	Lead	mg/kg	5				1100	*300*				10	19	-	19	-	17	-	17	19	19	-	-	18	-	17	-
	Manganese	mg/kg	5					*3800*				150	880	150	3200	380	2500	490	580	1800	*9500*	570	240	*4000*	2800	*8800*	3000
	Mercury	mg/kg	0.1		6.6			*40*				<0.1	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	<0.1	-	-	<0.1	-	<0.1	-
	Molybdenum	mg/kg	5	10								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Nickel	mg/kg	5				380	*400*				9.4	43	-	110	-	96	-	36	62	170	-	-	68	-	230	-
	Selenium	mg/kg	2		1			*200*				<2	<2	-	<2	-	<2	-	<2	<2	<2	-	-	<2	-	<2	-
	Silver	mg/kg	0.2	20								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Tin	mg/kg	10	50								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Zinc	mg/kg	5				850	*7400*				12	28	-	63	-	56	-	23	37	46	-	-	24	-	65	-
General	% Clay	%	1									-	-	-	-	-	-	-	-	9	-	-	-	-	-	-	-
	Cation Exchange Capacity	meq/100g										-	-	-	-	-	-	-	-	39	-	-	-	-	-	-	-
	Cyanide Total	mg/kg	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluoride	mg/kg	100	400								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Moisture Content (dried @ 103°C)	%	1									27	31	-	36	-	26	-	26	30	27	-	-	28	-	29	-
	Total Organic Carbon	%	1									-	-	-	-	-	-	-	-	6.1	-	-	-	-	-	-	-
	Conductivity	uS/cm	10									-	-	-	-	-	-	-	-	200	-	-	-	-	-	-	-
	pH (aqueous extract)	pH_Units	0.1									-	-	-	-	-	-	-	-	6.1	-	-	-	-	-	-	-
OCP	4,4-DDE	mg/kg	0.05									<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	a-BHC	mg/kg	0.05									<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	Aldrin	mg/kg	0.05									<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	Aldrin + Dieldrin	mg/kg	0.05					*6*				<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	b-BHC	mg/kg	0.05									<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	chlordane	mg/kg	0.1					*50*				<0.1	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	<0.1	-	-	<0.1	-	<0.1	-
	d-BHC	mg/kg	0.05									<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	DDD	mg/kg	0.05									<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	DDT	mg/kg	0.05				180					<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	DDT+DDE+DDD	mg/kg	0.05					*240*				<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	Dieldrin	mg/kg	0.05									<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	Endosulfan I	mg/kg	0.05									<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	Endosulfan II	mg/kg	0.05									<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	Endosulfan sulphate	mg/kg	0.05									<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	Endrin	mg/kg	0.05					*10*				<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	Endrin aldehyde	mg/kg	0.05									<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	Endrin ketone	mg/kg	0.05									<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	g-BHC (Lindane)	mg/kg	0.05									<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	Heptachlor	mg/kg	0.05					*6*				<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	Heptachlor epoxide	mg/kg	0.05									<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	Hexachlorobenzene	mg/kg	0.05	2				*10*				<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	Methoxychlor	mg/kg	0.05					*300*				<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-
	Toxaphene	mg/kg	1					*20*				<1	<1	-	<1	-	<1	-	<1	<1	<1	-	-	<1	-	<1	-

Table C1: Laboratory results

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				CSQG Interim Remediation Residential/ Park Use	CSQG Residential/Parkland Use	NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil	NEPM 2013 Table 1B EILs for Urban Res/Public Open Space	*NEPM 2013 Table 1A(1) HILs Res A Soil*	NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand (0-1m)	NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil																
Field_ID											TP27_0.1	TP27-0.2	TP28_0.1	TP28-0.3	TP29_0.1	TP29-0.3	TP30_0.1	TP30-0.5	TP31-0.3	TP32_0.1	TP32-0.3	TP32-0.5	TP33_0.1	TP33-0.3	TP34_0.1	TP34-0.3
Sampled_Date-Time											25/09/2019	25/09/2019	25/09/2019	25/09/2019	25/09/2019	25/09/2019	25/09/2019	25/09/2019	25/09/2019	25/09/2019	25/09/2019	25/09/2019	25/09/2019	25/09/2019	25/09/2019	25/09/2019
Lab_Report_Number											679599	689100	679599	689100	679599	689100	679599	689100	689100	679599	689100	689100	679599	689100	679599	689100
Method_Type	**ChemName**	**Units**	**EQL**																								
Metals/ Metalloids	Arsenic	mg/kg	2				100	*100*			<2	-	<2	-	<2	-	<2	-	-	2	-	-	2.1	-	<2	-
	Beryllium	mg/kg	2	4				*60*			2.7	-	<2	-	<2	-	<2	-	-	<2	-	-	<2	-	<2	-
	Boron	mg/kg	10					*4500*			<10	-	<10	-	<10	-	<10	-	-	<10	-	-	<10	-	<10	-
	Cadmium	mg/kg	0.4		10			*20*			<0.4	-	<0.4	-	<0.4	-	<0.4	-	-	<0.4	-	-	<0.4	-	<0.4	-
	Chromium (III+VI)	mg/kg	5				400				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chromium (hexavalent)	mg/kg	1		0.4			*100*			<1	-	<1	-	<1	-	<1	-	-	<1	-	-	<1	-	<1	-
	Cobalt	mg/kg	5	50				*100*			83	*170*	65	24	*240*	13	54	55	43	67	40	88	54	*170*	51	36
	Copper	mg/kg	5				230	*6000*			44	-	60	-	63	-	63	-	-	73	-	-	72	-	47	-
	Iron	mg/kg	20								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Iron (%)	%	0.01								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lead	mg/kg	5				1100	*300*			18	-	16	-	9.9	-	15	-	-	15	-	-	14	-	17	-
	Manganese	mg/kg	5					*3800*			1200	1800	2500	410	*6200*	370	2100	1100	960	2300	840	1400	2100	*4100*	1600	850
	Mercury	mg/kg	0.1		6.6			*40*			<0.1	-	<0.1	-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-	<0.1	-
	Molybdenum	mg/kg	5	10							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Nickel	mg/kg	5				380	*400*			56	-	110	-	170	-	130	-	-	120	-	-	110	-	60	-
	Selenium	mg/kg	2		1			*200*			<2	-	<2	-	<2	-	<2	-	-	<2	-	-	<2	-	<2	-
	Silver	mg/kg	0.2	20							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Tin	mg/kg	10	50							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Zinc	mg/kg	5				850	*7400*			59	-	70	-	63	-	68	-	-	71	-	-	68	-	50	-
General	% Clay	%	1								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cation Exchange Capacity	meq/100g									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cyanide Total	mg/kg	5								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluoride	mg/kg	100	400							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Moisture Content (dried @ 103°C)	%	1								31	-	35	-	30	-	34	-	-	32	-	-	31	-	32	-
	Total Organic Carbon	%	1								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Conductivity	uS/cm	10								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	pH (aqueous extract)	pH_Units	0.1								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OCP	4,4-DDE	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-
	a-BHC	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-
	Aldrin	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-
	Aldrin + Dieldrin	mg/kg	0.05					*6*			<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-
	b-BHC	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-
	chlordane	mg/kg	0.1					*50*			<0.1	-	<0.1	-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-	<0.1	-
	d-BHC	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-
	DDD	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-
	DDT	mg/kg	0.05				180				<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-
	DDT+DDE+DDD	mg/kg	0.05					*240*			<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-
	Dieldrin	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-
	Endosulfan I	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-
	Endosulfan II	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-
	Endosulfan sulphate	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-
	Endrin	mg/kg	0.05					*10*			<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-
	Endrin aldehyde	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-
	Endrin ketone	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-
	g-BHC (Lindane)	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-
	Heptachlor	mg/kg	0.05					*6*			<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-
	Heptachlor epoxide	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-
	Hexachlorobenzene	mg/kg	0.05	2				*10*			<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-
	Methoxychlor	mg/kg	0.05					*300*			<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-
	Toxaphene	mg/kg	1					*20*			<1	-	<1	-	<1	-	<1	-	-	<1	-	-	<1	-	<1	-

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Kinley Estate Western Area,
1000511

				CSQG Interim Remediation Residential/ Park Use	CSQG Residential/Parkland Use	NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil	NEPM 2013 Table 1B EILs for Urban Res/Public Open Space	***NEPM 2013 Table 1A(1) HILs Res A Soil***	**NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand (0-1m)**	NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil	**Field_ID**	TP35_0.1	TP35-0.3	TP36_0.1	TP37_0.1	TP37-0.2	TP38_0.1	TP38-0.2	TP39_0.1	TP39-0.2	TP40_0.1	TP40-0.2	TP41_0.1	QC03	TP42_0.1	TP42-0.2
											Sampled_Date-Time	25/09/2019	25/09/2019	25/09/2019	25/09/2019	25/09/2019	25/09/2019	25/09/2019	25/09/2019	25/09/2019	25/09/2019	25/09/2019	25/09/2019	25/09/2019	25/09/2019	25/09/2019
											Lab_Report_Number	679599	689100	679599	679599	689100	679599	689100	679599	689100	679599	689100	679599	679599	679599	689100
Method_Type	**ChemName**	**Units**	**EQL**																							
Metals/ Metalloids	Arsenic	mg/kg	2				100	*100*				2.3	-	<2	<2	-	<2	-	<2	-	<2	-	<2	2	2	-
	Beryllium	mg/kg	2	4				*60*				3.8	-	<2	<2	-	<2	-	<2	-	<2	-	<2	<2	<2	-
	Boron	mg/kg	10					*4500*				<10	-	<10	10	-	<10	-	<10	-	<10	-	<10	<10	12	-
	Cadmium	mg/kg	0.4		10			*20*				<0.4	-	<0.4	<0.4	-	<0.4	-	<0.4	-	<0.4	-	<0.4	<0.4	<0.4	-
	Chromium (III+VI)	mg/kg	5				400					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chromium (hexavalent)	mg/kg	1		0.4			*100*				<1	-	<1	<1	-	<1	-	<1	-	<1	-	<1	<1	<1	-
	Cobalt	mg/kg	5	50				*100*				*190*	*160*	46	31	35	35	38	68	*100*	51	*110*	11	12	25	23
	Copper	mg/kg	5				230	*6000*				68	-	51	70	-	65	-	50	-	49	-	52	54	58	-
	Iron	mg/kg	20									-	-	-	-	-	120,000	-	-	-	-	-	-	-	-	-
	Iron (%)	%	0.01									-	-	-	-	-	12	-	-	-	-	-	-	-	-	-
	Lead	mg/kg	5				1100	*300*				13	-	19	18	-	15	-	18	-	17	-	17	17	21	-
	Manganese	mg/kg	5					*3800*				*4200*	2000	1100	*4900*	*5000*	1800	1700	2100	2100	1400	2800	710	740	2500	2500
	Mercury	mg/kg	0.1		6.6			*40*				0.1	-	0.1	0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	0.1	-
	Molybdenum	mg/kg	5	10								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Nickel	mg/kg	5				380	*400*				180	-	68	97	-	58	-	73	-	73	-	59	60	75	-
	Selenium	mg/kg	2		1			*200*				<2	-	<2	<2	-	<2	-	<2	-	<2	-	<2	<2	<2	-
	Silver	mg/kg	0.2	20								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Tin	mg/kg	10	50								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Zinc	mg/kg	5				850	*7400*				130	-	57	72	-	48	-	67	-	73	-	48	50	72	-
General	% Clay	%	1									-	-	-	-	-	10	-	-	-	-	-	-	-	-	-
	Cation Exchange Capacity	meq/100g										-	-	-	-	-	27	-	-	-	-	-	-	-	-	-
	Cyanide Total	mg/kg	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluoride	mg/kg	100	400								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Moisture Content (dried @ 103°C)	%	1									30	-	37	31	-	33	-	32	-	29	-	29	30	35	-
	Total Organic Carbon	%	1									-	-	-	-	-	6.9	-	-	-	-	-	-	-	-	-
	Conductivity	uS/cm	10									-	-	-	-	-	110	-	-	-	-	-	-	-	-	-
	pH (aqueous extract)	pH_Units	0.1									-	-	-	-	-	6.5	-	-	-	-	-	-	-	-	-
OCP	4,4-DDE	mg/kg	0.05									<0.05	-	<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-
	a-BHC	mg/kg	0.05									<0.05	-	<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-
	Aldrin	mg/kg	0.05									<0.05	-	<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-
	Aldrin + Dieldrin	mg/kg	0.05					*6*				<0.05	-	<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-
	b-BHC	mg/kg	0.05									<0.05	-	<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-
	chlordane	mg/kg	0.1					*50*				<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	<0.1	-
	d-BHC	mg/kg	0.05									<0.05	-	<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-
	DDD	mg/kg	0.05									<0.05	-	<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-
	DDT	mg/kg	0.05				180					<0.05	-	<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-
	DDT+DDE+DDD	mg/kg	0.05					*240*				<0.05	-	<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-
	Dieldrin	mg/kg	0.05									<0.05	-	<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-
	Endosulfan I	mg/kg	0.05									<0.05	-	<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-
	Endosulfan II	mg/kg	0.05									<0.05	-	<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-
	Endosulfan sulphate	mg/kg	0.05									<0.05	-	<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-
	Endrin	mg/kg	0.05					*10*				<0.05	-	<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-
	Endrin aldehyde	mg/kg	0.05									<0.05	-	<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-
	Endrin ketone	mg/kg	0.05									<0.05	-	<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-
	g-BHC (Lindane)	mg/kg	0.05									<0.05	-	<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-
	Heptachlor	mg/kg	0.05					*6*				<0.05	-	<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-
	Heptachlor epoxide	mg/kg	0.05									<0.05	-	<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-
	Hexachlorobenzene	mg/kg	0.05	2				*10*				<0.05	-	<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-
	Methoxychlor	mg/kg	0.05					*300*				<0.05	-	<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	-
	Toxaphene	mg/kg	1					*20*				<1	-	<1	<1	-	<1	-	<1	-	<1	-	<1	<1	<1	-

Table C1: Laboratory results

Hume Lilydale Pty Ltd LBJ Corporation Pty Ltd,
Kinley Estate Western Area,
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											Field_ID	DAM 1	DAM 2
											Sampled_Date-Time	25/09/2019	25/09/2019
											Lab_Report_Number	679599	679599
				CSQG Interim Remediation Residential/ Park Use	CSQG Residential/Parkland Use	NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil	NEPM 2013 Table 1B EILs for Urban Res/Public Open Space	***NEPM 2013 Table 1A(1) HILs Res A Soil***	**NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand (0-1m)**	NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil			
Method_Type	**ChemName**	**Units**	**EQL**										
Metals/ Metalloids	Arsenic	mg/kg	2				100	*100*				<2	2.6
	Beryllium	mg/kg	2	4				*60*				-	-
	Boron	mg/kg	10					*4500*				-	-
	Cadmium	mg/kg	0.4		10			*20*				<0.4	<0.4
	Chromium (III+VI)	mg/kg	5				400					91	200
	Chromium (hexavalent)	mg/kg	1		0.4			*100*				<1	<1
	Cobalt	mg/kg	5	50				*100*				-	-
	Copper	mg/kg	5				230	*6000*				37	68
	Iron	mg/kg	20									-	-
	Iron (%)	%	0.01									-	-
	Lead	mg/kg	5				1100	*300*				20	18
	Manganese	mg/kg	5					*3800*				-	-
	Mercury	mg/kg	0.1		6.6			*40*				<0.1	<0.1
	Molybdenum	mg/kg	5	10								<5	<5
	Nickel	mg/kg	5				380	*400*				48	75
	Selenium	mg/kg	2		1			*200*				<2	<2
	Silver	mg/kg	0.2	20								<0.2	<0.2
	Tin	mg/kg	10	50								<10	<10
	Zinc	mg/kg	5				850	*7400*				39	83
General	% Clay	%	1									-	-
	Cation Exchange Capacity	meq/100g										-	-
	Cyanide Total	mg/kg	5									<5	<5
	Fluoride	mg/kg	100	400								330	200
	Moisture Content (dried @ 103°C)	%	1									27	32
	Total Organic Carbon	%	1									-	-
	Conductivity	uS/cm	10									-	-
	pH (aqueous extract)	pH_Units	0.1									7.3	7.4
OCP	4,4-DDE	mg/kg	0.05									<0.05	<0.05
	a-BHC	mg/kg	0.05									<0.05	<0.05
	Aldrin	mg/kg	0.05									<0.05	<0.05
	Aldrin + Dieldrin	mg/kg	0.05					*6*				<0.05	<0.05
	b-BHC	mg/kg	0.05									<0.05	<0.05
	chlordane	mg/kg	0.1					*50*				<0.1	<0.1
	d-BHC	mg/kg	0.05									<0.05	<0.05
	DDD	mg/kg	0.05									<0.05	<0.05
	DDT	mg/kg	0.05				180					<0.05	<0.05
	DDT+DDE+DDD	mg/kg	0.05					*240*				<0.05	<0.05
	Dieldrin	mg/kg	0.05									<0.05	<0.05
	Endosulfan I	mg/kg	0.05									<0.05	<0.05
	Endosulfan II	mg/kg	0.05									<0.05	<0.05
	Endosulfan sulphate	mg/kg	0.05									<0.05	<0.05
	Endrin	mg/kg	0.05					*10*				<0.05	<0.05
	Endrin aldehyde	mg/kg	0.05									<0.05	<0.05
	Endrin ketone	mg/kg	0.05									<0.05	<0.05
	g-BHC (Lindane)	mg/kg	0.05									<0.05	<0.05
	Heptachlor	mg/kg	0.05					*6*				<0.05	<0.05
	Heptachlor epoxide	mg/kg	0.05									<0.05	<0.05
	Hexachlorobenzene	mg/kg	0.05	2				*10*				<0.05	<0.05
	Methoxychlor	mg/kg	0.05					*300*				<0.05	<0.05
	Toxaphene	mg/kg	1					*20*				<1	<1
TPH/TRH	C6-C10	mg/kg	20							800		<20	<20
	C10-C16	mg/kg	50							1000		<50	<50
	C16-C34	mg/kg	100			1300				3500		<100	<100
	C34-C40	mg/kg	100			5600				10000		<100	<100
	C10 - C40 (Sum of total)	mg/kg	100									<100	<100
	Naphthalene	mg/kg	0.5				170		**3**			<0.5	<0.5
	F1 (C6-C10 less BTEX)	mg/kg	20			180			**45**			<20	<20
	F2 (C10-C16 less NAPHTHALENE)	mg/kg	50			120			**110**			<50	<50
	C6 - C9	mg/kg	20									<20	<20
	C10 - C14	mg/kg	20									<20	<20
	C15 - C28	mg/kg	50									<50	<50
	C29-C36	mg/kg	50									<50	<50
	+C10 - C36 (Sum of total)	mg/kg	50									<50	<50
PAH	Benzo[b+j]fluoranthene	mg/kg	0.5									<0.5	<0.5
	Acenaphthene	mg/kg	0.5									<0.5	<0.5
	Acenaphthylene	mg/kg	0.5									<0.5	<0.5
	Anthracene	mg/kg	0.5									<0.5	<0.5
	Benz(a)anthracene	mg/kg	0.5	1								<0.5	<0.5
	Benzo(a) pyrene	mg/kg	0.5			0.7						<0.5	<0.5
	Benzo(a)pyrene TEQ (lower bound)	mg/kg	0.5									<0.5	<0.5
	Benzo(g,h,i)perylene	mg/kg	0.5									<0.5	<0.5
	Benzo(k)fluoranthene	mg/kg	0.5	1								<0.5	<0.5
	Chrysene	mg/kg	0.5									<0.5	<0.5
	Dibenz(a,h)anthracene	mg/kg	0.5	1								<0.5	<0.5
	Fluoranthene	mg/kg	0.5									<0.5	<0.5
	Fluorene	mg/kg	0.5									<0.5	<0.5
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	1								<0.5	<0.5
	Naphthalene	mg/kg	0.5				170		**3**			<0.5	<0.5
	PAHs (Sum of total)	mg/kg	0.5					*300*				<0.5	<0.5
	Phenanthrene	mg/kg	0.5	5								<0.5	<0.5
	Pyrene	mg/kg	0.5	10								<0.5	<0.5
PCB	Arochlor 1016	mg/kg	0.1									<0.1	<0.1
	Arochlor 1221	mg/kg	0.1									<0.1	<0.1
	Arochlor 1232	mg/kg	0.1									<0.1	<0.1
	Arochlor 1242	mg/kg	0.1									<0.1	<0.1
	Arochlor 1248	mg/kg	0.1									<0.1	<0.1
	Arochlor 1254	mg/kg	0.1									<0.1	<0.1
	Arochlor 1260	mg/kg	0.1									<0.1	<0.1
	PCBs (Sum of total)	mg/kg	0.1		1.3			*1*				<0.1	<0.1
SVOC	2,4,5-trichlorophenol	mg/kg	1									<1	<1
	2,4,6-trichlorophenol	mg/kg	1									<1	<1
	2,4-dichlorophenol	mg/kg	0.5									<0.5	<0.5
	2,4-dimethylphenol	mg/kg	0.5	1								<0.5	<0.5
	2,4-dinitrophenol	mg/kg	5	1								<5	<5
	2,6-dichlorophenol	mg/kg	0.5									<0.5	<0.5
	2-chlorophenol	mg/kg	0.5									<0.5	<0.5

Table C1: Laboratory results

Hume Lilydale Pty Ltd LBJ Corporation Pty Ltd,
Kinley Estate Western Area,
1000511

											Field_ID	DAM 1	DAM 2
											Sampled_Date-Time	25/09/2019	25/09/2019
											Lab_Report_Number	679599	679599
Method_Type	ChemName	Units	EQL	CSQG Interim Remediation Residential/ Park Use	CSQG Residential/Parkland Use	NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil	NEPM 2013 Table 1B EILs for Urban Res/Public Open Space	*NEPM 2013 Table 1A(1) HILs Res A Soil*	NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand (0-1m)	NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil		
	2-methylphenol	mg/kg	0.2								<0.2	<0.2
	2-nitrophenol	mg/kg	1	1							<1	<1
	3-&4-methylphenol	mg/kg	0.4								<0.4	<0.4
	4,6-Dinitro-2-methylphenol	mg/kg	5	1							<5	<5
	4,6-Dinitro-o-cyclohexyl phenol	mg/kg	20								<20	<20
	4-chloro-3-methylphenol	mg/kg	1								<1	<1
	4-nitrophenol	mg/kg	5	1							<5	<5
	Dinoseb	mg/kg	20								<20	<20
	Pentachlorophenol	mg/kg	1		7.6			*100*			<1	<1
	Phenol	mg/kg	0.5	1	3.8			*3000*			<0.5	<0.5
	tetrachlorophenols	mg/kg	10	0.5							<10	<10
	Phenols (Total Halogenated)	mg/kg	1								<1	<1
	Phenols (Total Non Halogenated)	mg/kg	20								<20	<20
VOC	1,1,1,2-tetrachloroethane	mg/kg	0.5								<0.5	<0.5
	1,1,1-trichloroethane	mg/kg	0.5								<0.5	<0.5
	1,1,2,2-tetrachloroethane	mg/kg	0.5	5							<0.5	<0.5
	1,1,2-trichloroethane	mg/kg	0.5								<0.5	<0.5
	Total MAH	mg/kg	0.5								<0.5	<0.5
	1,1-dichloroethane	mg/kg	0.5	5							<0.5	<0.5
	1,1-dichloroethene	mg/kg	0.5	5							<0.5	<0.5
	1,2,3-trichloropropane	mg/kg	0.5								<0.5	<0.5
	1,2,4-trichlorobenzene	mg/kg	0.5								<0.5	<0.5
	1,2,4-trimethylbenzene	mg/kg	0.5								<0.5	<0.5
	1,2-dibromoethane	mg/kg	0.5								<0.5	<0.5
	1,2-dichlorobenzene	mg/kg	0.5	1							<0.5	<0.5
	1,2-dichloroethane	mg/kg	0.5	5							<0.5	<0.5
	1,2-dichloropropane	mg/kg	0.5	5							<0.5	<0.5
	1,3,5-trimethylbenzene	mg/kg	0.5								<0.5	<0.5
	1,3-dichlorobenzene	mg/kg	0.5	1							<0.5	<0.5
	1,3-dichloropropane	mg/kg	0.5								<0.5	<0.5
	1,4-dichlorobenzene	mg/kg	0.5	1							<0.5	<0.5
	Methyl Ethyl Ketone	mg/kg	0.5								<0.5	<0.5
	4-chlorotoluene	mg/kg	0.5								<0.5	<0.5
	4-Methyl-2-pentanone	mg/kg	0.5								<0.5	<0.5
	Acetone	mg/kg	0.5								<0.5	<0.5
	Allyl chloride	mg/kg	0.5								<0.5	<0.5
	Benzene	mg/kg	0.1			65			**0.5**		<0.1	<0.1
	Bromobenzene	mg/kg	0.5								<0.5	<0.5
	Bromochloromethane	mg/kg	0.5								<0.5	<0.5
	Bromodichloromethane	mg/kg	0.5								<0.5	<0.5
	Bromoform	mg/kg	0.5								<0.5	<0.5
	Bromomethane	mg/kg	0.5								<0.5	<0.5
	Carbon disulfide	mg/kg	0.5								<0.5	<0.5
	Carbon tetrachloride	mg/kg	0.5	5							<0.5	<0.5
	Chlorobenzene	mg/kg	0.5	1							<0.5	<0.5
	Chlorodibromomethane	mg/kg	0.5								<0.5	<0.5
	Chloroethane	mg/kg	0.5								<0.5	<0.5
	Chloroform	mg/kg	0.5	5							<0.5	<0.5
	Chloromethane	mg/kg	0.5								<0.5	<0.5
	cis-1,2-dichloroethene	mg/kg	0.5								<0.5	<0.5
	cis-1,3-dichloropropene	mg/kg	0.5								<0.5	<0.5
	Dibromomethane	mg/kg	0.5								<0.5	<0.5
	Dichlorodifluoromethane	mg/kg	0.5								<0.5	<0.5
	Dichloromethane	mg/kg	0.5	5							<0.5	<0.5
	Ethylbenzene	mg/kg	0.1			125			**55**		<0.1	<0.1
	Hexachlorobutadiene	mg/kg	0.5								<0.5	<0.5
	Iodomethane	mg/kg	0.5								<0.5	<0.5
	Isopropylbenzene	mg/kg	0.5								<0.5	<0.5
	Styrene	mg/kg	0.5	5							<0.5	<0.5
	Trichloroethene	mg/kg	0.5	5	0.01						<0.5	<0.5
	Tetrachloroethene	mg/kg	0.5	5	0.2						<0.5	<0.5
	Toluene	mg/kg	0.1			105			**160**		<0.1	<0.1
	trans-1,2-dichloroethene	mg/kg	0.5								<0.5	<0.5
	trans-1,3-dichloropropene	mg/kg	0.5								<0.5	<0.5
	Trichlorofluoromethane	mg/kg	0.5								<0.5	<0.5
	Vinyl chloride	mg/kg	0.5								<0.5	<0.5
	Xylene (m & p)	mg/kg	0.2								<0.2	<0.2
	Xylene (o)	mg/kg	0.1								<0.1	<0.1
	Xylene Total	mg/kg	0.3			45			**40**		<0.3	<0.3

Table C2: Leachability Analytical Results Summary

Hume Lilydale Pty Ltd LBJ Corporation Pty Ltd,
Kinley Estate Western Area,
1000511

				Field_ID	CAT1	DAM1	DAM2	DRAIN3	QC02	TP11-0.1	TP25-0.1	TP26-0.1
				Sampled_Date-Time	26/09/2019	26/09/2019	26/09/2019	26/09/2019	25/09/2019	26/09/2019	25/09/2019	25/09/2019
				Lab_Report_Number	683682	683682	683682	683682	EM1917680	683682	683682	683682
		IWRG 621 Upper Limits (June 2009)										
ChemName	Units	Category C	Category B	EQL								
pH of Leaching Fluid	pH_Units			0.1	5.1	5.1	5.1	5.1	-	5.1	5.1	5.1
pH (Final)	pH_Units			0.1	5.4	5	5.2	5.1	-	5.6	6.1	5.1
pH (Initial)	pH_Units			0.1	7.6	7	7.7	7.1	-	7.9	8.6	7
Chromium (III+VI)	mg/L			0.01	-	0.02	<0.01	-	-	-	-	-
Cobalt	mg/L			0.01	-	-	-	-	<0.1	-	-	<0.01
Copper	mg/L	200	800	0.01	<0.01	-	-	-	-	<0.01	-	-
Manganese	mg/L			0.01	-	-	-	-	<0.1	-	-	0.07
Nickel	mg/L	2	8	0.01	-	-	-	-	-	-	<0.01	0.02
Zinc	mg/L	300	1200	0.01	-	-	-	0.8	-	-	-	-
Chromium (hexavalent)	mg/L	5	20	0.05	-	<0.05	<0.05	-	-	-	-	-

Table C3: RPD Analysis

Hume Lilydale Pty Ltd LBJ Corporation Pty Ltd,
Kinley Estate Western Area,
1000511

				Blind Replicate (intra-lab duplicates)									Split Sample (inter-lab duplicates)					
Lab Report Number				679598	679598		679599	679599		679599	679599		679599	EM1917234		679599	EM1917234	
Field ID				TP07-0.1	QC01	**RPD**	TP24_0.1	QC02	**RPD**	TP41_0.1	QC03	**RPD**	TP24_0.1	QC02	**RPD**	TP41_0.1	QC03	**RPD**
Sampled Date/Time				24/09/2019	24/09/2019		25/09/2019	25/09/2019		25/09/2019	25/09/2019		25/09/2019	25/09/2019		25/09/2019	25/09/2019	
Method_Type	**ChemName**	**Units**	**EQL**															
OCP	Vic EPA IWRG 621 OCP (Total)	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1			<0.1		
	Vic EPA IWRG 621 Other OCP (Total)	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1			<0.1		
	Hexachlorobenzene	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
Inorganic	Moisture Content (dried @ 103°C)	%	1	28.0	32.0	13	30.0	27.0	11	29.0	30.0	3	30.0			29.0		
Heavy Metal	Lead	mg/kg	5	20.0	21.0	5	19.0	19.0	0	17.0	17.0	0	19.0	16.0	17	17.0	15.0	13
	Arsenic	mg/kg	2 (Primary): 5 (Interlab)	2.9	2.9	0	<2.0	<2.0	0	<2.0	2.0	0	<2.0	<5.0	0	<2.0	<5.0	0
	Beryllium	mg/kg	2 (Primary): 1 (Interlab)	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	1.0	0	<2.0	<1.0	0
	Boron	mg/kg	10	<10.0	<10.0	0	<10.0	<10.0	0	<10.0	<10.0	0	<10.0			<10.0		
	Cadmium	mg/kg	0.4 (Primary): 1 (Interlab)	<0.4	<0.4	0	<0.4	<0.4	0	<0.4	<0.4	0	<0.4	<1.0	0	<0.4	<1.0	0
	Cobalt	mg/kg	5 (Primary): 2 (Interlab)	7.7	8.2	6	**68.0**	**460.0**	**148**	11.0	12.0	9	**68.0**	**43.0**	**45**	**11.0**	**8.0**	**32**
	Copper	mg/kg	5	8.9	9.8	10	36.0	43.0	18	52.0	54.0	4	36.0	37.0	3	52.0	52.0	0
	Manganese	mg/kg	5	200.0	210.0	5	**1800.0**	**9500.0**	**136**	710.0	740.0	4	1800.0	1830.0	2	710.0	749.0	5
	Mercury	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0
	Nickel	mg/kg	5 (Primary): 2 (Interlab)	12.0	11.0	9	**62.0**	**170.0**	**93**	59.0	60.0	2	62.0	58.0	7	59.0	48.0	21
	Selenium	mg/kg	2	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0	<2.0			<2.0		
	Zinc	mg/kg	5	20.0	21.0	5	37.0	46.0	22	48.0	50.0	4	37.0	30.0	21	48.0	38.0	23
Inorganic	Chromium (hexavalent)	mg/kg	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0			<1.0		
OCP	4,4-DDE	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	a-BHC	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Aldrin	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Aldrin + Dieldrin	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	b-BHC	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	chlordane	mg/kg	0.1 (Primary): 0.05 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.05	0
	d-BHC	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	DDD	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	DDT	mg/kg	0.05 (Primary): 0.2 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.2	0	<0.05	<0.2	0
	DDT+DDE+DDD	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Dieldrin	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Endosulfan I	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Endosulfan II	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Endosulfan sulphate	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Endrin	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Endrin aldehyde	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Endrin ketone	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	g-BHC (Lindane)	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Heptachlor	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Heptachlor epoxide	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Methoxychlor	mg/kg	0.05 (Primary): 0.2 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.2	0	<0.05	<0.2	0
	Toxaphene	mg/kg	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0			<1.0		

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 80 (1-10 x EQL); 50 (10-30 x EQL); 30 (> 30 x EQL))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

Table C4: Field Blank and Rinsate Analysis

Hume Lilydale Pty Ltd LBJ Corporation Pty Ltd,
Kinley Estate Western Area,
1000511

Lab Report Number	679598	679599	679599	679598	679599	679599
Field ID	FB01	FB02	FB03	R01	R02	R03
Sampled_Date/Time	24/09/2019	25/09/2019	25/09/2019	24/09/2019	25/09/2019	25/09/2019
Sample Type	Field_B	Field_B	Field_B	Rinsate	Rinsate	Rinsate

Method_Type	**ChemName**	**Units**	**EQL**						
Organic	Naphthalene	µg/l	10	<10	<10	<10	<10	<10	<10
Volatile	Benzene	µg/l	1	<1	<1	<1	<1	<1	<1
	Ethylbenzene	µg/l	1	<1	<1	<1	<1	<1	<1
	Toluene	µg/l	1	<1	<1	<1	<1	<1	<1
	Xylene (m & p)	µg/l	2	<2	<2	<2	<2	<2	<2
	Xylene (o)	µg/l	1	<1	<1	<1	<1	<1	<1
	Xylene Total	µg/l	3	<3	<3	<3	<3	<3	<3

UCL Input data - Samples recovered from Older Volcanics

ID	Sample depth	Inferred geology (mapping)	Log appears consistent with mapping?	[Co]	[Mn]
TP16_0.1	0.1	Tvo	yes	56	1200
TP16-0.3	0.3	Tvo	yes	50	470
TP16-0.5	0.5	Tvo	yes	77	730
TP17-0.1	0.1	Tvo	No->Dxh? (boundary?)	120	3600
TP17-0.3	0.3	Tvo	No->Dxh? (boundary?)	22	420
TP21-0.1	0.1	Tvo	No->Dxh?	110	3200
TP21-0.5	0.5	Tvo	No->Dxh?	20	380
TP22-0.1	0.1	Tvo	yes	85	2500
TP22-0.5	0.5	Tvo	yes	24	490
TP23-0.1	0.1	Tvo	yes	24	580
TP24_0.1	0.1	Tvo	yes	68	1800
TP24-0.3	0.3	Tvo	yes	33	570
TP24-0.5	0.5	Tvo	yes	17	240
TP25_0.1	0.1	Tvo	No->Dxh? (boundary?)	97	4000
TP25-0.5	0.5	Tvo	No->Dxh? (boundary?)	150	2800
TP26_0.1	0.1	Tvo	yes	380	8800
TP26-0.3	0.3	Tvo	yes	92	3000
TP27_0.1	0.1	Tvo	yes	83	1200
TP27-0.2	0.2	Tvo	yes	170	1800
TP28_0.1	0.1	Tvo	yes	65	2500
TP28-0.3	0.3	Tvo	yes	24	410
TP29_0.1	0.1	Tvo	yes	240	6200
TP29-0.3	0.3	Tvo	yes	13	370
TP30_0.1	0.1	Tvo	yes	54	2100
TP30-0.5	0.5	Tvo	yes	55	1100
TP31-0.3	0.3	Tvo	yes	43	960
TP32_0.1	0.1	Tvo	yes	67	2300
TP32-0.3	0.3	Tvo	yes	40	840
TP32-0.5	0.5	Tvo	yes	88	1400
TP33_0.1	0.1	Tvo	yes	54	2100
TP33-0.3	0.3	Tvo	yes	170	4100
TP34_0.1	0.1	Tvo	yes	51	1600
TP34-0.3	0.3	Tvo	yes	36	850
TP35_0.1	0.1	Tvo	yes	190	4200
TP35-0.3	0.3	Tvo	yes	160	2000
TP36_0.1	0.1	Tvo	yes	46	1100
TP37_0.1	0.1	Tvo	yes	31	4900
TP37-0.2	0.2	Tvo	yes	35	5000
TP38_0.1	0.1	Tvo	yes	35	1800
TP38-0.2	0.2	Tvo	yes	38	1700
TP39_0.1	0.1	Tvo	yes	68	2100
TP39-0.2	0.2	Tvo	yes	100	2100
TP40_0.1	0.1	Tvo	yes	51	1400
TP40-0.2	0.2	Tvo	yes	110	2800
TP41_0.1	0.1	Tvo	yes	11	710
TP42_0.1	0.1	Tvo	yes	25	2500
TP42-0.2	0.2	Tvo	yes	23	2500

1	[illegible]										
2											
3	User Selected Options										
4	Date/Time of Computation	ProUCL 5.117/12/2019 20:34:40									
5	From File	WorkSheet.xls									
6	Full Precision	OFF									
7	Confidence Coefficient	95%									
8	Number of Bootstrap Operations	2000									
9											
10											
11	[illegible]										
12											
13	[illegible]										
14	Total Number of Observations	47				Number of Distinct Observations	39				
15						Number of Missing Observations	0				
16	Minimum	11				Mean	76.62				
17	Maximum	380				Median	54				
18	SD	68.71				SD of logged Data	0.785				
19	Coefficient of Variation	0.897				Skewness	2.383				
20											
21	[illegible]										
22	A-D Test Statistic	0.542				[illegible]					
23	5% A-D Critical Value	0.764				Data appear Gamma Distributed at 5% Significance Level					
24	K-S Test Statistic	0.109				[illegible]					
25	5% K-S Critical Value	0.131				Data appear Gamma Distributed at 5% Significance Level					
26	[illegible]										
27											
28	[illegible]										
29	k hat (MLE)	1.779				k star (bias corrected MLE)	1.68				
30	Theta hat (MLE)	43.06				Theta star (bias corrected MLE)	45.61				
31	nu hat (MLE)	167.3				nu star (bias corrected)	157.9				
32	MLE Mean (bias corrected)	76.62				MLE Sd (bias corrected)	59.11				
33						Approximate Chi Square Value (0.05)	129.9				
34	Adjusted Level of Significance	0.0449				Adjusted Chi Square Value	129.1				
35											
36	[illegible]										
37	95% Approximate Gamma UCL (use when n>=50)	93.17				95% Adjusted Gamma UCL (use when n<50)	93.75				
38											
39	[illegible]										
40	95% Adjusted Gamma UCL	93.75									
41											
42	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.										
43	Recommendations are based upon data size, data distribution, and skewness.										
44	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).										
45	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.										
46											
47											
48	[illegible]										
49											
50	[illegible]										
51	Total Number of Observations	47				Number of Distinct Observations	35				
52						Number of Missing Observations	0				
53	Minimum	240				Mean	2115				
54	Maximum	8800				Median	1800				
55	SD	1709				SD of logged Data	0.842				
56	Coefficient of Variation	0.808				Skewness	1.742				
57											

58											
59				A-D Test Statistic	0.256						
60				5% A-D Critical Value	0.765	Data appear Gamma Distributed at 5% Significance Level					
61				K-S Test Statistic	0.0625						
62				5% K-S Critical Value	0.131	Data appear Gamma Distributed at 5% Significance Level					
63											
64											
65											
66				k hat (MLE)	1.737			k star (bias corrected MLE)	1.641		
67				Theta hat (MLE)	1218			Theta star (bias corrected MLE)	1289		
68				nu hat (MLE)	163.3			nu star (bias corrected)	154.2		
69				MLE Mean (bias corrected)	2115			MLE Sd (bias corrected)	1652		
70								Approximate Chi Square Value (0.05)	126.5		
71				Adjusted Level of Significance	0.0449			Adjusted Chi Square Value	125.7		
72											
73											
74				95% Approximate Gamma UCL (use when n>=50)	2579			95% Adjusted Gamma UCL (use when n<50)	2595		
75											
76											
77				95% Adjusted Gamma UCL	2595						
78											
79	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.										
80	Recommendations are based upon data size, data distribution, and skewness.										
81	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).										
82	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.										
83											

Appendix D: EIL calculation sheets

Inputs
Select contaminant from list below
As
Below needed to calculate fresh and aged ACLs
Below needed to calculate fresh and aged ABCs
or for fresh ABCs only
or for aged ABCs only

Outputs		
Land use	Arsenic generic EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	20	40
Urban residential and open public spaces	50	100
Commercial and industrial	80	160

Inputs
Select contaminant from list below
Cr_III
Below needed to calculate fresh and aged ACLs
Enter % clay (values from 0 to 100%)
9.5
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration
8.4
or for aged ABCs only
Enter State (or closest State)
VIC
Enter traffic volume (high or low)
low

Outputs		
Land use	Cr III soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	140	140
Urban residential and open public spaces	240	400
Commercial and industrial	350	660

Inputs
Select contaminant from list below
Cu
Below needed to calculate fresh and aged ACLs
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)
33
Enter soil pH (calcium chloride method) (values from 1 to 14)
6.9
Enter organic carbon content (%OC) (values from 0 to 50%)
6.5
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration
8.4
or for aged ABCs only
Enter State (or closest State)
VIC
Enter traffic volume (high or low)
low

Outputs		
Land use	Cu soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	80	85
Urban residential and open public spaces	140	230
Commercial and industrial	190	330

Inputs
Select contaminant from list below
DDT
Below needed to calculate fresh and aged ACLs
Below needed to calculate fresh and aged ABCs
or for fresh ABCs only
or for aged ABCs only

Outputs		
Land use	DDT generic EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	3	3
Urban residential and open public spaces	180	180
Commercial and industrial	640	640

Inputs
Select contaminant from list below
Naphthalene
Below needed to calculate fresh and aged ACLs
Below needed to calculate fresh and aged ABCs
or for fresh ABCs only
or for aged ABCs only

Outputs		
Land use	Naphthalene generic EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	10	10
Urban residential and open public spaces	170	170
Commercial and industrial	370	370

Inputs
Select contaminant from list below
Ni
Below needed to calculate fresh and aged ACLs
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)
33
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration
8.4
or for aged ABCs only
Enter State (or closest State)
VIC
Enter traffic volume (high or low)
low

Outputs		
Land use	Ni soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	45	70
Urban residential and open public spaces	150	380
Commercial and industrial	260	640

Inputs
Select contaminant from list below
Pb
Below needed to calculate fresh and aged ACLs
Below needed to calculate fresh and aged ABCs
or for fresh ABCs only
or for aged ABCs only

Outputs		
Land use	Lead generic EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	110	470
Urban residential and open public spaces	270	1100
Commercial and industrial	440	1800

Inputs
Select contaminant from list below
Zn
Below needed to calculate fresh and aged ACLs
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)
33
Enter soil pH (calcium chloride method) (values from 1 to 14)
6.9
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration
8.4
or for aged ABCs only
Enter State (or closest State)
VIC
Enter traffic volume (high or low)
low

Outputs		
Land use	Zn soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	120	220
Urban residential and open public spaces	350	850
Commercial and industrial	530	1300

Appendix E: Test pit logs

BOREHOLE LOG

INVESTIGATION Id.: **DAM1**

SHEET: 1 OF 1

PROJECT Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5819137.00 mN 353578.00 mE	METHOD: HA	START DATE: 26/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 26/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
HA					CL - CLAY, low plasticity, grey-brown mottled orange-brown, soft. Roots.	M			DAM1 PID = 0.0 ppm	0.05		
					0.1m: Target depth			0.25				

COMMENTS

Hole Depth 0.1m

BOREHOLE LOG

INVESTIGATION Id.: **DAM2**

SHEET: 1 OF 1

PROJECT Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5819196.00 mN 353619.00 mE	METHOD: HA	START DATE: 26/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 26/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
HA					CL - CLAY, low plasticity, grey-brown mottled orange-brown, soft. Roots.	M			DAM2 PID = 0.0 ppm	0.05		
					0.1m: Target depth			0.25				

COMMENTS

Hole Depth 0.1m

BOREHOLE LOG

INVESTIGATION Id.:
DRAIN1
SHEET: 1 OF 1

PROJECT Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5819170.00 mN 353415.00 mE	METHOD: HA	START DATE: 26/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 26/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
HA					CL - CLAY, low plasticity, grey-brown mottled orange-brown, soft. Roots.	M			DRAIN1 PID = 0.0 ppm	0.05		
					0.1m: Target depth			0.25				

COMMENTS

Hole Depth 0.1m

BOREHOLE LOG

INVESTIGATION Id.:
DRAIN2
SHEET: 1 OF 1

PROJECT Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5819191.00 mN 353546.00 mE	METHOD: HA	START DATE: 26/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 26/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
HA					CL - CLAY, low plasticity, grey-brown mottled orange-brown, soft. Roots.	M			DRAIN2 PID = 0.0 ppm	0.05		
					0.1m: Target depth			0.25				

COMMENTS

Hole Depth 0.1m

BOREHOLE LOG

INVESTIGATION Id.:
DRAIN3
SHEET: 1 OF 1

PROJECT Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5819226.00 mN 353537.00 mE	METHOD: HA	START DATE: 26/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 26/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
HA					CL - CLAY, low plasticity, grey-brown mottled orange-brown, soft. Roots.	M			DRAIN3 PID = 0.0 ppm	0.05		
					0.1m: Target depth			0.25				

COMMENTS

Hole Depth 0.1m

BOREHOLE LOG

INVESTIGATION Id.: **TP01**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5819392.51 mN 353874.09 mE	METHOD: ME	START DATE: 24/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 24/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					ML - clayey SILT, low plasticity, brown, soft. Roots.	D-M			TP01-0.1 PID = 0.0 ppm	0.05		
ME					CL - CLAY, low plasticity, brown mottled light brown, soft.	M				0.10		
								0.25	TP01-0.3 PID = 0.0 ppm	0.25		
ME					CL - CLAY, low plasticity, light brown mottled orange, firm.					0.30		
									TP01-0.5 PID = 0.0 ppm	0.45		
					0.5m: Target depth			0.50				

COMMENTS

Hole Depth 0.5m

BOREHOLE LOG

INVESTIGATION Id.: **TP02**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5819392.51 mN 353791.63 mE	METHOD: ME	START DATE: 24/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 24/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP (Dynamic Cone Penetrometer)	ADDITIONAL COMMENTS
ME					FILL: CLAY, red, low plasticity, soft, roots	D-M			TP02-0.1 PID = 0.0 ppm	0.05		
ME					CL - CLAY, low plasticity, brown mottled light brown, soft.	M				0.10		
								0.25	TP02-0.3 PID = 0.0 ppm	0.25		
ME					CL - CLAY, low plasticity, light brown mottled orange, stiff.					0.30		
									TP02-0.5 PID = 0.0 ppm	0.45		
					0.5m: Target depth			0.50				

COMMENTS

Hole Depth 0.5m

BOREHOLE LOG

INVESTIGATION Id.: **TP03**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5819358.51 mN 353691.63 mE	METHOD: ME	START DATE: 24/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 24/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP (Dynamic Cone Penetrometer)	ADDITIONAL COMMENTS
ME					ML - clayey SILT, low plasticity, dark brown, soft. Roots.	D-M			TP03-0.1 PID = 0.0 ppm	0.05		
ME					CL - CLAY, low plasticity, brown mottled light brown, soft.	M				0.10		
								0.25	TP03-0.3 PID = 0.0 ppm	0.25		
ME					CL - CLAY, low plasticity, light brown mottled orange, firm.					0.30		
					0.5m: Target depth			0.50				

COMMENTS

Hole Depth 0.5m

BOREHOLE LOG

INVESTIGATION Id.: **TP04**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5819335.72 mN 353598.09 mE	METHOD: ME	START DATE: 24/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 24/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					ML - clayey SILT, low plasticity, dark brown, soft. Roots.	D-M			TP04-0.1 PID = 0.0 ppm	0.05		
ME					CL - CLAY, low plasticity, brown mottled light brown, soft. Trace roots.	M		0.25	TP04-0.3 PID = 0.0 ppm	0.10 0.25		
ME					CL - CLAY, low plasticity, light brown mottled orange, firm. Trace organic inclusions, black.				TP04-0.5 PID = 0.0 ppm	0.30 0.45		
					0.5m: Target depth			0.50				

COMMENTS

Hole Depth 0.5m

BOREHOLE LOG

INVESTIGATION Id.: **TP05**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5819258.51 mN 353321.70 mE	METHOD: ME	START DATE: 24/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 24/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					ML - clayey SILT, low plasticity, dark brown, soft. Roots.	D-M			TP05-0.1 PID = 0.0 ppm	0.05		
ME					CL - CLAY, low plasticity, brown mottled light brown, soft. Trace roots.	M				0.10		
								0.25	TP05-0.3 PID = 0.0 ppm	0.25		
ME					CL - CLAY, low plasticity, light brown mottled orange, firm. Trace organic inclusions, black.					0.30		
					0.5m: Target depth			0.50				

COMMENTS

Hole Depth 0.5m

BOREHOLE LOG

INVESTIGATION Id.: **TP06**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5819258.51 mN 353391.63 mE	METHOD: ME	START DATE: 24/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 24/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					ML - clayey SILT, low plasticity, dark brown, soft. Roots.	D-M			TP06-0.1 PID = 0.0 ppm	0.05		
ME					CL - CLAY, low plasticity, brown mottled light brown, soft. Trace roots.	M				0.10		
								0.25	TP06-0.3 PID = 0.0 ppm	0.25		
					0.4m: - Grades to grey-brown mottled orange.					0.30		
					0.5m: Target depth			0.50				

COMMENTS

Hole Depth 0.5m

BOREHOLE LOG

INVESTIGATION Id.: **TP07**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5819258.51 mN 353491.63 mE	METHOD: ME	START DATE: 24/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 24/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					ML - clayey SILT, low plasticity, dark brown, soft. Roots.	D-M			TP07-0.1/QC01 PID = 0.0 ppm	0.05		
ME					CL - CLAY, low plasticity, brown mottled light brown, soft. Trace roots.	M				0.10		
								0.25	TP07-0.3 PID = 0.0 ppm	0.25		
ME					CL - CLAY, low plasticity, light brown mottled orange, firm. Trace organic inclusions, black.					0.30		
									TP07-0.5 PID = 0.0 ppm	0.45		
					0.5m: Target depth			0.50				

COMMENTS

Hole Depth 0.5m

BOREHOLE LOG

INVESTIGATION Id.: **TP08**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5819258.51 mN 353591.63 mE	METHOD: ME	START DATE: 25/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 25/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					ML - clayey SILT, low plasticity, dark grey, soft. Roots.	M			TP08-0.1 PID = 0.0 ppm	0.05		
ME					CL - CLAY, low plasticity, grey, soft. Trace roots, trace lime inclusion.					0.10		
								0.25	TP08-0.3 PID = 0.0 ppm	0.25 0.25		
ME					CL - CLAY, low plasticity, brown-grey mottled orange, soft to firm. Trace organic inclusions, black.	M-W						
					0.5m: Target depth			0.50	TP08-0.5 PID = 0.0 ppm			

COMMENTS

Hole Depth 0.5m

BOREHOLE LOG

INVESTIGATION Id.: **TP09**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5819258.51 mN 353691.63 mE	METHOD: ME	START DATE: 24/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 24/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					ML - clayey SILT trace gravel, low plasticity, dark brown, soft. Roots.	M			TP09-0.1 PID = 0.0 ppm	0.05		
ME					CL - gravelly CLAY, low plasticity, grey-brown, soft to firm. Gravel, angular and rounded; trace roots.					0.10		
								0.25	TP09-0.3 PID = 0.0 ppm	0.25		
ME					CL - CLAY, low plasticity, grey-brown mottled orange, soft to firm.					0.30		
									TP09-0.5 PID = 0.0 ppm	0.45		
					0.5m: Target depth			0.50				

COMMENTS

Hole Depth 0.5m

BOREHOLE LOG

INVESTIGATION Id.: **TP10**

SHEET: 1 OF 1

PROJECT Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5819258.51 mN 353791.63 mE	METHOD: HA	START DATE: 26/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 26/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP (Dynamic Cone Penetrometer)	ADDITIONAL COMMENTS
HA					ML - clayey SILT, low plasticity, grey-brown, soft to firm. Roots.	M			TP10-0.1 PID = 0.0 ppm	0.05		
					0.1m: Target depth			0.25				

COMMENTS

Hole Depth 0.1m

BOREHOLE LOG

INVESTIGATION Id.:
TP11&CAT1
SHEET: 1 OF 1

PROJECT Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5819158.51 mN 353691.63 mE	METHOD: HA	START DATE: 26/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 26/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
HA					ML - clayey SILT, low plasticity, greyish brown, soft to firm. Roots, limestone cobble, 70mm, subrounded.	M			TP11-0.1/CAT1 PID = 0.0 ppm	0.05		
					0.1m: Target depth			0.25				

COMMENTS

Hole Depth 0.1m

BOREHOLE LOG

INVESTIGATION Id.: **TP12**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5819158.51 mN 353591.63 mE	METHOD: ME	START DATE: 24/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 24/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					FILL: Silty CLAY, dark brown, low plasticity, soft, roots	M			TP12-0.1 PID = 0.0 ppm	0.05		
										0.10		
					FILL: CLAY, dark grey mottled orange, low plasticity, soft to firm.				TP12-0.2 PID = 0.0 ppm	0.15		
										0.20		
								0.25				
									TP12-0.5 PID = 0.0 ppm	0.45		- Terracotta pipe observed at 0.5 m.
					0.5m: Target depth			0.50				

COMMENTS

Hole Depth 0.5m

BOREHOLE LOG

INVESTIGATION Id.: **TP13**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5819158.51 mN 353491.63 mE	METHOD: ME	START DATE: 24/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 24/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					ML - clayey SILT, low plasticity, dark brown, soft. Roots.	D-M			TP13-0.1 PID = 0.0 ppm	0.05		
ME					CL - CLAY, low plasticity, brown mottled light brown, soft. Trace roots.	M				0.10		
								0.25	TP13-0.3 PID = 0.0 ppm	0.25		
ME					CL - CLAY, low plasticity, light brown mottled orange, firm. Trace organic inclusions, black.					0.30		
									TP13-0.5 PID = 0.0 ppm	0.45		
					0.5m: Target depth			0.50				

COMMENTS

Hole Depth 0.5m

BOREHOLE LOG

INVESTIGATION Id.: **TP14**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5819158.51 mN 353391.63 mE	METHOD: ME	START DATE: 24/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 24/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP (Dynamic Cone Penetrometer)	ADDITIONAL COMMENTS
ME					ML - clayey SILT, dark brown, soft. Roots.	D-M			TP14-0.1 PID = 0.0 ppm	0.05		
ME					CL - CLAY, low plasticity, light brown mottled orange, stiff.					0.10		
								0.25	TP14-0.3 PID = 0.0 ppm	0.25		
										0.30		
					0.5m: Target depth			0.50				

COMMENTS

Hole Depth 0.5m

BOREHOLE LOG

INVESTIGATION Id.: **TP15**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5819158.51 mN 353304.55 mE	METHOD: ME	START DATE: 24/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 24/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					CL - silty CLAY, low plasticity, grey-dark brown, soft. Roots.	D-M			TP15-0.1 PID = 0.0 ppm	0.05		
										0.10		
ME					CL - CLAY, low plasticity, dark brown & dark grey mottled orange, stiff.			0.25				
								0.50	TP15-0.6 PID = 0.0 ppm	0.55		
										0.60		
								0.75				
					1m: Target depth			1.00				
								1.25				

COMMENTS

Hole Depth 1m

Scale 1:7

These logs are to be read in conjunction with the full Tonkin & Taylor report

Rev.: A

BOREHOLE LOG

INVESTIGATION Id.: **TP16**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5819058.51 mN 353291.63 mE	METHOD: ME	START DATE: 24/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 24/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					ML - clayey SILT, low plasticity, dark brown, soft. Roots.	M			TP16-0.1 PID = 0.0 ppm	0.05		
ME					CL - CLAY, low plasticity, dark grey, stiff. Trace roots.	D-M				0.10		
					0.4m: - Orange and light brown mottle			0.25	TP16-0.3 PID = 0.0 ppm	0.25		
										0.30		
									TP16-0.5 PID = 0.0 ppm	0.45		
					0.5m: Target depth			0.50				

COMMENTS

Hole Depth 0.5m

BOREHOLE LOG

INVESTIGATION Id.: **TP17**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5819058.51 mN 353391.63 mE	METHOD: ME	START DATE: 24/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 24/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					ML - clayey SILT, low plasticity, dark brown, soft. Roots.	D-M			TP17-0.1 PID = 0.0 ppm	0.05		
ME					CL - CLAY, low plasticity, brown mottled light brown, soft. Trace roots.	M				0.10		
								0.25	TP17-0.3 PID = 0.0 ppm	0.25		
ME					CL - CLAY, low plasticity, light brown mottled orange, firm. Trace organic inclusions, black.					0.30		
									TP17-0.5 PID = 0.0 ppm	0.45		
					0.5m: Target depth			0.50				

COMMENTS

Hole Depth 0.5m

BOREHOLE LOG

INVESTIGATION Id.: **TP18**

SHEET: 1 OF 1

PROJECT Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5819058.51 mN 353491.63 mE	METHOD: ME	START DATE: 24/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 24/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					ML - clayey SILT, low plasticity, dark brown, soft. Roots.	D-M			TP18-0.1 PID = 0.0 ppm	0.05		
					CL - CLAY, low plasticity, light brown mottled orange, firm. Trace roots.					0.10		
ME								0.25	TP8-0.4 PID = 0.0 ppm	0.35		
										0.40		
					0.5m: Target depth			0.50				

COMMENTS

Hole Depth 0.5m

BOREHOLE LOG

INVESTIGATION Id.: **TP19**

SHEET: 1 OF 1

PROJECT Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5819058.51 mN 353591.63 mE	METHOD: HA	START DATE: 26/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 26/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP (Dynamic Cone Penetrometer)	ADDITIONAL COMMENTS
HA					ML - clayey SILT, low plasticity, grey-brown, soft to firm. Roots.	M			TP19-0.1 PID = 0.0 ppm	0.05		
					0.1m: Target depth			0.25				

COMMENTS

Hole Depth 0.1m

BOREHOLE LOG

INVESTIGATION Id.: **TP20**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5818958.51 mN 353491.63 mE	METHOD: ME	START DATE: 25/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 25/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					ML - clayey SILT, low plasticity, dark brown, soft. Roots.	D-M			TP20-0.1 PID = 0.0 ppm	0.05		
ME					CL - CLAY, low plasticity, brown mottled light brown, soft. Trace roots, trace limestone.	M				0.10		
								0.25	TP20-0.3 PID = 0.0 ppm	0.25		
ME					CL - CLAY, low plasticity, light brown mottled orange, firm. Trace organic inclusions, black, cobble, orange-brown, 100mm, subangular.					0.30		
									TP20-0.5 PID = 0.0 ppm	0.45		
					0.5m: Target depth			0.50				

COMMENTS

Hole Depth 0.5m

BOREHOLE LOG

INVESTIGATION Id.: **TP21**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5818958.51 mN 353391.63 mE	METHOD: ME	START DATE: 24/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 24/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					ML - clayey SILT, low plasticity, dark brown, soft. Roots.	D-M			TP21-0.1 PID = 0.0 ppm	0.05		
					CL - CLAY, low plasticity, light brown mottled orange, firm. Trace roots.					0.10		
ME					0.45m: - Trace gravels, grey, fine to medium grained, subangular.			0.25				
									TP21-0.5 PID = 0.0 ppm	0.45		
					0.5m: Target depth			0.50				

COMMENTS

Hole Depth 0.5m

BOREHOLE LOG

INVESTIGATION Id.: **TP22**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5818958.51 mN 353291.63 mE	METHOD: ME	START DATE: 24/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 24/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					ML - clayey SILT, low plasticity, dark brown, soft. Roots.	M			TP22-0.1 PID = 0.0 ppm	0.05		
ME					CL - CLAY, low plasticity, dark grey, stiff. Trace roots.	D-M				0.10		
					0.4m: - Orange and light brown mottle			0.25				
									TP22-0.5 PID = 0.0 ppm	0.45		
					0.5m: Target depth			0.50				

COMMENTS

Hole Depth 0.5m

BOREHOLE LOG

INVESTIGATION Id.: **TP23**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5818858.51 mN 353291.63 mE	METHOD: ME	START DATE: 24/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 24/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					ML - clayey SILT, low plasticity, dark brown, soft. Roots.	D-M						
ME					CL - CLAY, low plasticity, dark grey, stiff. Trace roots.	M		0.25	TP23-0.1 PID = 0.0 ppm	0.10 / 0.15		
								0.50	TP23-0.6 PID = 0.0 ppm	0.55 / 0.60		
						M-W		0.75				
					1m: Target depth			1.00				
								1.25				

COMMENTS

Hole Depth 1m

Scale 1:7

These logs are to be read in conjunction with the full Tonkin & Taylor report

Rev.: A

BOREHOLE LOG

INVESTIGATION Id.: **TP24**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5818858.51 mN 353391.63 mE	METHOD: ME	START DATE: 25/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 25/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					ML - clayey SILT, low plasticity, dark grey, soft. Roots.	M			TP24-0.1/QC02 PID = 0.0 ppm	0.05		
										0.10		
ME					CL - CLAY, low plasticity, brown mottled light brown, soft to firm. Trace roots.			0.25	TP24-0.3 PID = 0.0 ppm	0.25		
										0.30		
ME					CL - gravelly CLAY, low plasticity, dark grey, firm. Gravel, fine to medium grained, subangular to subrounded, orange & yellow.			0.50	TP24-0.6 PID = 0.0 ppm	0.55		
					0.6m: Target depth			0.75				

COMMENTS

Hole Depth 0.6m

BOREHOLE LOG

INVESTIGATION Id.: **TP25**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5818858.51 mN 353464.04 mE	METHOD: ME	START DATE: 25/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 25/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					ML - clayey SILT, low plasticity, dark brown, soft. Roots.	D-M			TP25-0.1 PID = 0.0 ppm	0.05		
ME					CL - CLAY, low plasticity, brown mottled light brown, soft. Trace roots, trace limestone.	M		0.25		0.10		
ME					CL - CLAY, low plasticity, light brown mottled orange, firm. Trace organic inclusions, black.				TP25-0.5 PID = 0.0 ppm	0.45		
					0.5m: Target depth			0.50				

COMMENTS

Hole Depth 0.5m

BOREHOLE LOG

INVESTIGATION Id.: **TP26**

SHEET: 1 OF 1

PROJECT Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5818758.51 mN 353391.63 mE	METHOD: ME	START DATE: 25/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 25/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					ML - clayey SILT, low plasticity, dark brown, soft. Roots. 0.15 - 0.2m: - Trace fine to medium grained gravels	D-M			TP26-0.1	0.05		
ME					CL - CLAY, low plasticity, dark grey, soft. Trace roots.	M			TP26-0.2	0.10 0.20		
ME					CL - CLAY, low plasticity, light brown mottled orange, firm. Trace organic inclusions, black.			0.25		0.25		
					0.5m: Target depth			0.50				

COMMENTS

Hole Depth 0.5m

BOREHOLE LOG

INVESTIGATION Id.: **TP27**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5818758.51 mN 353291.63 mE	METHOD: ME	START DATE: 25/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 25/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					ML - clayey SILT, low plasticity, brown-grey, soft. Roots.	D-M			TP27-0.1 PID = 0.0 ppm	0.05		
ME					CL - CLAY, low plasticity, brown-grey mottled light brown & orange, soft to firm. Trace roots, trace black inclusions.	M				0.10		
									TP27-0.2 PID = 0.0 ppm	0.15		
					0.2m: Target depth			0.25				

COMMENTS

Hole Depth 0.2m

BOREHOLE LOG

INVESTIGATION Id.: **TP28**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5818624.58 mN 353216.36 mE	METHOD: ME	START DATE: 25/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 25/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP (Dynamic Cone Penetrometer)	ADDITIONAL COMMENTS
ME					ML - clayey SILT, low plasticity, dark brown, soft. Roots.	M			TP28-0.1 PID = 0.0 ppm	0.05		
					CH - CLAY, high plasticity, dark grey mottled orange, soft. Trace roots.					0.10		
ME								0.25	TP28-0.3 PID = 0.0 ppm	0.25		
										0.30		
					0.5m: Target depth			0.50				

COMMENTS

Hole Depth 0.5m

BOREHOLE LOG

INVESTIGATION Id.: **TP29**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5818658.51 mN 353291.63 mE	METHOD: ME	START DATE: 25/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 25/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					ML - clayey SILT, low plasticity, dark brown, soft. Roots.	M			TP29-0.1 PID = 0.0 ppm	0.05		
ME					CH - CLAY, high plasticity, dark grey mottled orange, soft. Trace roots.					0.10		
								0.25	TP29-0.3 PID = 0.0 ppm	0.25		
										0.30		
					0.5m: Target depth			0.50				

COMMENTS

Hole Depth 0.5m

BOREHOLE LOG

INVESTIGATION Id.: **TP30**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5818658.51 mN 353391.63 mE	METHOD: ME	START DATE: 25/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 25/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					ML - clayey SILT, low plasticity, dark grey, soft. Roots.	M			TP30-0.1 PID = 0.0 ppm	0.05		
ME					CL - CLAY, low plasticity, orange mottled dark grey, firm to stiff. Trace roots.				TP30-0.2 PID = 0.0 ppm	0.10 0.15 0.20		
ME					CL - CLAY, low plasticity, orange, yellow & dark grey, firm to stiff.	D-M		0.25	TP30-0.5 PID = 0.0 ppm	0.45		
					0.5m: Target depth			0.50				

COMMENTS

Hole Depth 0.5m

BOREHOLE LOG

INVESTIGATION Id.: **TP31**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5818558.51 mN 353391.63 mE	METHOD: ME	START DATE: 25/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 25/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					ML - clayey SILT, low plasticity, dark grey, soft. Roots.	M			TP31-0.1 PID = 0.0 ppm	0.05		
ME					CL - CLAY, low plasticity, dark grey mottled orange & light grey, firm. Trace roots.					0.10		
								0.25	TP31-0.3 PID = 0.0 ppm	0.25		
ME					CL - CLAY, low plasticity, dark grey mottled orange & light brown, firm to stiff. Trace roots.	D-M				0.30		
					0.5m: Target depth			0.50				

COMMENTS

Hole Depth 0.5m

BOREHOLE LOG

INVESTIGATION Id.: **TP32**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5818558.51 mN 353291.63 mE	METHOD: ME	START DATE: 25/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 25/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					ML - clayey SILT, low plasticity, dark grey, soft. Roots.	M			TP32-0.1 PID = 0.0 ppm	0.05		
					CL - CLAY, low plasticity, dark grey mottled orange & grey, stiff. Trace roots.					0.10		
ME					0.4m: - Grades to gravelly clay, fine to medium grained gravel, green-blue, subangular			0.25	TP32-0.3 PID = 0.0 ppm	0.25		
										0.30		
									TP32-0.5 PID = 0.0 ppm	0.45		
					0.5m: Target depth			0.50				

COMMENTS

Hole Depth 0.5m

BOREHOLE LOG

INVESTIGATION Id.: **TP33**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5818558.20 mN 353216.36 mE	METHOD: ME	START DATE: 25/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 25/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					ML - clayey SILT, low plasticity, dark grey, soft. Roots.	M			TP33-0.1 PID = 0.0 ppm	0.05		
ME					CL - CLAY, low plasticity, dark grey mottled dark orange & light brown, firm.					0.10		
								0.25	TP33-0.3 PID = 0.0 ppm	0.25		
										0.30		
					0.5m: Target depth			0.50				

COMMENTS

Hole Depth 0.5m

BOREHOLE LOG

INVESTIGATION Id.: **TP34**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5818458.51 mN 353216.31 mE	METHOD: ME	START DATE: 25/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 25/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					ML - clayey SILT, low plasticity, dark grey, soft. Roots.	M			TP34-01 PID = 0.0 ppm	0.05		
					CL - CLAY, low plasticity, dark grey mottled dark orange & light brown, firm.					0.10		
ME								0.25	TP34-0.3 PID = 0.0 ppm	0.25		
										0.30		
					0.5m: Target depth			0.50				

COMMENTS

Hole Depth 0.5m

BOREHOLE LOG

INVESTIGATION Id.: **TP35**

SHEET: 1 OF 1

PROJECT Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5818458.51 mN 353291.63 mE	METHOD: ME	START DATE: 25/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 25/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					ML - clayey SILT, low plasticity, dark grey, soft. Roots.	M			TP35-0.1 PID = 0.0 ppm	0.05		
ME					CL - CLAY, low plasticity, grey mottled dark orange, firm.					0.10		
								0.25	TP35-0.3 PID = 0.0 ppm	0.25		
										0.30		
					0.5m: Target depth			0.50				

COMMENTS

Hole Depth 0.5m

BOREHOLE LOG

INVESTIGATION Id.: **TP36**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5818458.51 mN 353391.63 mE	METHOD: ME	START DATE: 25/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 25/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP Dynamic Cone Penetrometer	ADDITIONAL COMMENTS
ME					ML - clayey SILT, low plasticity, dark grey, soft. Roots.	M			TP36-0.1 PID = 0.0 ppm	0.05		
ME					CL - CLAY, low plasticity, dark grey, firm. Cobble, orange, 80mm.				TP36-0.2 PID = 0.0 ppm	0.10 0.15		
					0.2m: Target depth			0.25				

COMMENTS

Hole Depth 0.2m

BOREHOLE LOG

INVESTIGATION Id.: **TP37**

SHEET: 1 OF 1

PROJECT Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5818358.51 mN 353391.63 mE	METHOD: ME	START DATE: 25/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 25/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP (Dynamic Cone Penetrometer)	ADDITIONAL COMMENTS
ME					CL - CLAY, low plasticity, red-brown, firm. Trace black inclusions.	D-M			TP37-0.1 PID = 0.0 ppm	0.05		
										0.10		
									TP37-0.2 PID = 0.0 ppm	0.15		
					0.2m: Target depth			0.25				

COMMENTS

Hole Depth 0.2m

BOREHOLE LOG

INVESTIGATION Id.: **TP38**

SHEET: 1 OF 1

PROJECT Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5818358.51 mN 353291.63 mE	METHOD: ME	START DATE: 25/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 25/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP (Dynamic Cone Penetrometer)	ADDITIONAL COMMENTS
ME					CL - CLAY, low plasticity, red-brown mottled orange, firm. Trace black inclusions.	D-M			TP38-0.1 PID = 0.0 ppm	0.05		
										0.10		
									TP38-0.2 PID = 0.0 ppm	0.15		
					0.2m: Target depth			0.25				

COMMENTS

Hole Depth 0.2m

BOREHOLE LOG

INVESTIGATION Id.: **TP39**

SHEET: 1 OF 1

PROJECT Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5818358.51 mN 353191.63 mE	METHOD: ME	START DATE: 25/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 25/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP (Dynamic Cone Penetrometer)	ADDITIONAL COMMENTS
ME					CL - CLAY, low plasticity, dark brown mottled orange, firm. Roots, tree roots.	D-M			TP39-0.1 PID = 0.0 ppm	0.05		
										0.10		
									TP39-0.2 PID = 0.0 ppm	0.15		
					0.2m: Target depth			0.25				

COMMENTS

Hole Depth 0.2m

BOREHOLE LOG

INVESTIGATION Id.: **TP40**

SHEET: 1 OF 1

PROJECT Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5818285.94 mN 353191.63 mE	METHOD: ME	START DATE: 25/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 25/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP (Dynamic Cone Penetrometer)	ADDITIONAL COMMENTS
ME					CL - CLAY, low plasticity, dark brown mottled orange, firm. Roots, tree roots.	D-M			TP40-0.1 PID = 0.0 ppm	0.05		
										0.10		
									TP40-0.2 PID = 0.0 ppm	0.15		
					0.2m: Target depth			0.25				

COMMENTS

Hole Depth 0.2m

BOREHOLE LOG

INVESTIGATION Id.: **TP41**

SHEET: 1 OF 1

PROJECT Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5818288.56 mN 353291.63 mE	METHOD: ME	START DATE: 25/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 25/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP (Dynamic Cone Penetrometer)	ADDITIONAL COMMENTS
ME					CL - CLAY, low plasticity, red-brown, firm. Trace black inclusions.	D-M			TP41-0.1/QC03 PID = 0.0 ppm	0.05		
										0.10		
									TP41-0.2 PID = 0.0 ppm	0.15		
					0.2m: Target depth			0.25				

COMMENTS

Hole Depth 0.2m

BOREHOLE LOG

INVESTIGATION Id.: **TP42**

SHEET: 1 OF 1

PROJECT: Kinley Estate Western Land	LOCATION: Lilydale Quarry, Lilydale	JOB No.: 1000511.0000.FIELD
CO-ORDINATES: (UTM55H) 5818289.21 mN 353391.63 mE	METHOD: ME	START DATE: 25/09/2019
	EQUIPMENT: Yanmar Vi030-6B	FINISH DATE: 25/09/2019
R.L.:	TECHNICIAN: James Priestley	LOGGED BY: FOT
DATUM:	CONTRACTOR: -	CHECKED BY: RKO

GEOLOGICAL | TESTING

METHOD	WATER	UNIT	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE	CONSISTENCY / RELATIVE DENSITY	RL (m) / DEPTH (m)	SAMPLES TESTS	SAMPLES	DCP (Dynamic Cone Penetrometer)	ADDITIONAL COMMENTS
ME					CL - CLAY, low plasticity, red-brown, firm. Tree roots, trace black inclusions, cobble, red, soft, 100mm, subangular.	D-M			TP42-0.1 PID = 0.0 ppm	0.05		
										0.10		
									TP42-0.2 PID = 0.0 ppm	0.15		
					0.2m: Target depth			0.25				

COMMENTS

Hole Depth 0.2m

Appendix F: NATA certified laboratory reports

(DOUBLE SIDED).

Tonkin+Taylor
Ground Floor, 95 Coventry Street, Southbank, Victoria 3006.
Ph: 61-3-9863 8686 Fax: 61-3-9863 8685

Chain of Custody (COC)

Sheet 1 of 5
Serial No. [illegible]

Laboratory: [illegible]	Address:
Project Name:	Project Manager: RKO
Sampler Name: RKO/POT	Job Number: 1000571

Comments/Instructions: Deliver Results to Rowen@tonkintaylor.com.au

Container Type & Preservation Codes: I-Ice, P-Plastic, G-Glass, V-Vial, N-Nitric Acid Preserved, C-Hydrochloric Acid Preserved, S-Sulphuric Acid Preserved

Analysis Required:

Sample ID	Sample Date	Time	Sample Matrix (e.g soil, water etc)	Container/Preservative Type (e.g. glass, vial etc)	CHILLED, TICK IF YES	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]		[illegible]	[illegible]		X			
[illegible]									
[illegible]									
[illegible]						X	X		
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[illegible]									
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[illegible]									
[illegible]						X			
[illegible]									
[illegible]									
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[illegible]						X			
[illegible]									
[illegible]						X			
[illegible]									
[illegible]									
[illegible]						X			

Results Requested Within: 24hrs 48hrs 5days (circled)

Total:

Relinquished By: [illegible]		Received By: [illegible] To		Relinquished By:	Received By:	
Signature: [illegible]	Date:	Signature: [illegible]	Date: [illegible]	Signature:	Signature:	Date:
Company: T+T	Time:	Company: EF	Time: [illegible]	Company:	Company:	Time:

NO ICE 15.6 26/9
Courier 4:47pm

Tonkin+Taylor

Ground Floor, 95 Coventry Street, Southbank, Victoria 3006.
Ph: 61-3-9863 8686 Fax: 61-3-9863 8685

Chain of Custody (COC)

Sheet 2 of [illegible]

Serial No. [illegible]

Laboratory: Eurofins	Address:
Project Name:	Project Manager: [illegible]
Samplers Name: [illegible]	Job Number: [illegible]

Comment/Instructions: See page 1

Container Type & Preservation Codes: I-Ice, P-Plastic, G-Glass, V-Vial, N-Nitric Acid Preserved, C-Hydrochloric Acid Preserved, S-Sulphuric Acid Preserved

Analysis Required:

Sample ID	Sample Date	Time	Sample Matrix (e.g soil, water etc)	Container/Preservative Type (e.g. glass, vial etc)	CHILLED, TICK IF YES	M/3, 4/3	R2	E1	H/3						[illegible]
[illegible]	[illegible]		[illegible]	[illegible]											
[illegible]															
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[illegible]															

Results Requested Within: 24hrs 48hrs 5days

Total:

Relinquished By: [illegible]		Received By: [illegible]		Relinquished By:	Received By:	
Signature: [illegible]	Date:	Signature: [illegible]	Date: [illegible]	Signature:	Signature:	Date
Company: [illegible]	Time:	Company: ET	Time: [illegible]	Company:	Company:	Time

26
4:4? pm

679598

Tonkin+Taylor

Ground Floor, 95 Coventry Street, Southbank, Victoria 3006.
Ph: 61-3-9863 8686 Fax: 61-3-9863 8685

Chain of Custody (COC)

Sheet [illegible] of [illegible]

Serial No. [illegible]

Laboratory:

Address:

Project Name:

Project Manager: [illegible]

Samplers Name: [illegible]

Job Number: [illegible]

Comment/Instructions: [illegible]

Container Type & Preservation Codes: I-Ice, P-Plastic, G-Glass, V-Vial, N-Nitric Acid Preserved, C-Hydrochloric Acid Preserved, S-Sulphuric Acid Preserved

Analysis Required:

Sample ID	Sample Date	Time	Sample Matrix (e.g soil, water etc)	Container/Preservative Type (e.g. glass, vial etc)	CHILLED, TICK IF YES	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]		[illegible]	[illegible]					
[illegible]						X			
[illegible]									
[illegible]						X			
[illegible]									
[illegible]						X			
[illegible]									
[illegible]						X			
[illegible]			[illegible]	[illegible]				X	
[illegible]								X	

Results Requested Within: 24hrs 48hrs [illegible] days

Total:

Relinquished By: [illegible]		Received By: [illegible]		Relinquished By:	Received By:	
Signature: [illegible]	Date:	Signature: [illegible]	[redacted] Date:	Signature:	Signature:	[illegible]
Company: [illegible]	Time:	Company: ET	[redacted] Time:	Company:	Company:	Time

26/9
1:47pm

679598

Enviro Sample Vic

From: Harry Bacalis
Sent: Tuesday, 1 October 2019 9:40 AM
To: Rhian Owen
Cc: Enviro Sample Vic; Catherine Wilson
Subject: RE: Eurofins Sample Receipt Advice - Report 679599 : Site 1000511

No worries Rhian

Canh – Can you make the following changes below?

Kind regards,

Harry Bacalis
Phone: +61 3 8564 5064
Mobile: +61 438 858 924
Email : HarryBacalis@eurofins.com

From: Rhian Owen [mailto:ROwen@tonkintaylor.com.au]
Sent: Tuesday, 1 October 2019 9:35 AM
To: Harry Bacalis
Subject: FW: Eurofins Sample Receipt Advice - Report 679599 : Site 1000511

EXTERNAL EMAIL*

Hi Harry

Could you please test the vials for BTEXN? For Report 679598 also please.

Also, this one *"Eurofins Sample Receipt Advice - Report 679598 : Site 1000571"*

Is also Site 1000511.

Thanks

Rhian Owen
T +61 3 9863 8688 M +61 447 540 473

From: EnviroSampleVic@eurofins.com <EnviroSampleVic@eurofins.com>
Sent: Saturday, 28 September 2019 8:49 AM
To: Rhian Owen <ROwen@tonkintaylor.com.au>
Subject: Eurofins Sample Receipt Advice - Report 679599 : Site 1000511

Dear Valued Client,
CAN'T DO METAL ANALYSIS WITH VIAL

Please find attached a Sample Receipt Advice (SRA), a Summary Sheet and a scanned copy of your Chain-of-Custody (COC). It is important that you check this documentation to ensure that the details are correct such as the Client Job Number, Turn Around Time, any comments in the Notes section and sample numbers as well as the requested analysis. If there are any irregularities then please contact your Eurofins Analytical Services Manager as soon as possible to make certain that they get changed.

Kind Regards
Adlin George

Eurofins | mgt
6 Monterey Road
Dandenong South
Austalia
Phone: +61 3 85645043

EnviroNote 1079 - PFAS Fingerprinting
EnviroNote 1080 - Total Organofluorine Analysis & PFAS Investigations

eurofins | Environment Testing

Melbourne
6 Monterey Road
Dandenong South Vic 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**Tonkin & Taylor P/L**
Contact name:	Rhian Owen
Project ID:	1000571
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Sep 26, 2019 4:47 PM
Eurofins reference:	**679598**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☒ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

M13 can't be analysed for R01 & FB01 as we received vial.

Contact notes

If you have any questions with respect to these samples please contact:

Harry Bacalis on Phone : or by e.mail: HarryBacalis@eurofins.com

Results will be delivered electronically via e.mail to Rhian Owen - rowen@tonkintaylor.com.au.

Tonkin & Taylor P/L
Level 3, 99 Coventry St
Southbank
VIC 3006

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Rhian Owen**

Report **679598-S**
Project name
Project ID 1000571
Received Date Sep 26, 2019

Client Sample ID			**TP01-0.1**	**TP02-0.1**	**TP03-0.1**	**TP04-0.1**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**M19-Se42272**	**M19-Se42273**	**M19-Se42274**	**M19-Se42275**
Date Sampled			**Sep 24, 2019**	**Sep 24, 2019**	**Sep 24, 2019**	**Sep 24, 2019**
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	96	102	101	103
Tetrachloro-m-xylene (surr.)	1	%	102	105	103	106
% Clay	1	%	-	25	-	-
Chromium (hexavalent)	1	mg/kg	< 1	< 1	< 1	< 1
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	-	160	-	-
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	-	6.1	-	-
Total Organic Carbon	0.1	%	-	4.1	-	-
% Moisture	1	%	21	30	38	27

Client Sample ID			TP01-0.1	TP02-0.1	TP03-0.1	TP04-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Se42272	M19-Se42273	M19-Se42274	M19-Se42275
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	5.6	< 2
Beryllium	2	mg/kg	< 2	2.6	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Cobalt	5	mg/kg	< 5	35	19	13
Copper	5	mg/kg	11	52	30	16
Iron	20	mg/kg	-	120000	-	-
Lead	5	mg/kg	14	11	130	23
Manganese	5	mg/kg	170	370	400	410
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	11	72	44	21
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Zinc	5	mg/kg	12	38	110	20
Heavy Metals						
Iron (%)	0.01	%	-	12	-	-
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	23	-	-

Client Sample ID			TP05-0.1	TP06-0.1	TP07-0.1	TP09-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Se42276	M19-Se42277	M19-Se42278	M19-Se42279
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			TP05-0.1	TP06-0.1	TP07-0.1	TP09-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Se42276	M19-Se42277	M19-Se42278	M19-Se42279
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	86	104	84	90
Tetrachloro-m-xylene (surr.)	1	%	98	105	97	103
Chromium (hexavalent)	1	mg/kg	< 1	< 1	< 1	< 1
% Moisture	1	%	26	27	28	31
Heavy Metals						
Arsenic	2	mg/kg	< 2	4.3	2.9	< 2
Beryllium	2	mg/kg	< 2	2.9	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Cobalt	5	mg/kg	5.2	320	7.7	12
Copper	5	mg/kg	15	59	8.9	24
Lead	5	mg/kg	20	21	20	23
Manganese	5	mg/kg	140	2000	200	440
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	11	100	12	25
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Zinc	5	mg/kg	17	93	20	24

Client Sample ID			TP12-0.1	TP13-0.1	TP14-0.1	TP15-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Se42280	M19-Se42281	M19-Se42282	M19-Se42283
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			TP12-0.1	TP13-0.1	TP14-0.1	TP15-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Se42280	M19-Se42281	M19-Se42282	M19-Se42283
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	93	92	119	96
Tetrachloro-m-xylene (surr.)	1	%	98	99	104	102
Chromium (hexavalent)	1	mg/kg	< 1	< 1	< 1	< 1
% Moisture	1	%	32	35	29	36
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	< 2	2.5
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Cobalt	5	mg/kg	12	< 5	32	21
Copper	5	mg/kg	25	8.9	30	33
Lead	5	mg/kg	28	14	16	28
Manganese	5	mg/kg	220	140	820	730
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	31	10	52	45
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Zinc	5	mg/kg	36	15	33	48

Client Sample ID			TP16-0.1	QC01	TP17-0.1	TP18-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Se42284	M19-Se42285	M19-Se42286	M19-Se42287
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			TP16-0.1	QC01	TP17-0.1	TP18-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Se42284	M19-Se42285	M19-Se42286	M19-Se42287
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	92	109	95	96
Tetrachloro-m-xylene (surr.)	1	%	103	108	101	104
Chromium (hexavalent)	1	mg/kg	< 1	< 1	< 1	< 1
% Moisture	1	%	24	32	28	28
Heavy Metals						
Arsenic	2	mg/kg	2.3	2.9	2.4	2.3
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Cobalt	5	mg/kg	56	8.2	120	59
Copper	5	mg/kg	53	9.8	40	30
Lead	5	mg/kg	15	21	17	18
Manganese	5	mg/kg	1200	210	3600	1300
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	86	11	94	62
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Zinc	5	mg/kg	48	21	45	38

Client Sample ID			TP21-0.1	TP22-0.1	TP23-0.1
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			M19-Se42288	M19-Se42289	M19-Se42290
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit			
Organochlorine Pesticides					
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05

Client Sample ID			TP21-0.1	TP22-0.1	TP23-0.1
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			M19-Se42288	M19-Se42289	M19-Se42290
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit			
Organochlorine Pesticides					
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	84	88	94
Tetrachloro-m-xylene (surr.)	1	%	63	63	105
Chromium (hexavalent)	1	mg/kg	< 1	< 1	< 1
% Moisture	1	%	36	26	26
Heavy Metals					
Arsenic	2	mg/kg	2.2	< 2	< 2
Beryllium	2	mg/kg	< 2	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4
Cobalt	5	mg/kg	110	85	24
Copper	5	mg/kg	58	56	30
Lead	5	mg/kg	19	17	17
Manganese	5	mg/kg	3200	2500	580
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	110	96	36
Selenium	2	mg/kg	< 2	< 2	< 2
Zinc	5	mg/kg	63	56	23

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Organochlorine Pesticides	Melbourne	Oct 03, 2019	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8270)			
NEPM Screen for Soil Classification			
% Clay	Brisbane	Oct 03, 2019	0 Days
- Method: LTM-GEN-7040			
Conductivity (1:5 aqueous extract at 25°C as rec.)	Melbourne	Oct 03, 2019	7 Days
- Method: LTM-INO-4030 Conductivity			
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	Melbourne	Oct 03, 2019	7 Days
- Method: LTM-GEN-7090 pH in soil by ISE			
Total Organic Carbon	Melbourne	Oct 04, 2019	28 Days
- Method: LTM-INO-4060 Total Organic Carbon in water and soil			
Heavy Metals	Melbourne	Oct 03, 2019	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Cation Exchange Capacity	Melbourne	Oct 04, 2019	180 Days
- Method: LTM-MET-3060 Cation Exchange Capacity by bases & Exchangeable Sodium Percentage			
Chromium (hexavalent)	Melbourne	Oct 03, 2019	28 Days
- Method: APHA 3500-Cr Hexavalent Chromium- (Extraction:- USEPA3060)			
% Moisture	Melbourne	Sep 28, 2019	14 Days
- Method: LTM-GEN-7080 Moisture			

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NATA # 1261
Site # 23736

Company Name: Tonkin & Taylor P/L
Address: Level 3, 99 Coventry St
Southbank
VIC 3006

Project Name:
Project ID: 1000571

Order No.:
Report #: 679598
Phone: 03 9863 8686
Fax: 03 9863 8685

Received: Sep 26, 2019 4:47 PM
Due: Oct 4, 2019
Priority: 5 Day
Contact Name: Rhian Owen

Eurofins Analytical Services Manager : Harry Bacalis

Sample Detail						HOLD	Organochlorine Pesticides	NEPM 2013 Metals : Metals M13	BTEX and Naphthalene	Moisture Set	NEPM Screen for Soil Classification
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											X
Perth Laboratory - NATA Site # 23736											
External Laboratory											
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
1	TP01-0.1	Sep 24, 2019		Soil	M19-Se42272		X	X		X	
2	TP02-0.1	Sep 24, 2019		Soil	M19-Se42273		X	X		X	X
3	TP03-0.1	Sep 24, 2019		Soil	M19-Se42274		X	X		X	
4	TP04-0.1	Sep 24, 2019		Soil	M19-Se42275		X	X		X	
5	TP05-0.1	Sep 24, 2019		Soil	M19-Se42276		X	X		X	
6	TP06-0.1	Sep 24, 2019		Soil	M19-Se42277		X	X		X	
7	TP07-0.1	Sep 24, 2019		Soil	M19-Se42278		X	X		X	
8	TP09-0.1	Sep 24, 2019		Soil	M19-Se42279		X	X		X	
9	TP12-0.1	Sep 24, 2019		Soil	M19-Se42280		X	X		X	

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Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											X
Perth Laboratory - NATA Site # 23736											
10	TP13-0.1	Sep 24, 2019		Soil	M19-Se42281		X	X		X	
11	TP14-0.1	Sep 24, 2019		Soil	M19-Se42282		X	X		X	
12	TP15-0.1	Sep 24, 2019		Soil	M19-Se42283		X	X		X	
13	TP16-0.1	Sep 24, 2019		Soil	M19-Se42284		X	X		X	
14	QC01	Sep 24, 2019		Soil	M19-Se42285		X	X		X	
15	TP17-0.1	Sep 24, 2019		Soil	M19-Se42286		X	X		X	
16	TP18-0.1	Sep 24, 2019		Soil	M19-Se42287		X	X		X	
17	TP21-0.1	Sep 24, 2019		Soil	M19-Se42288		X	X		X	
18	TP22-0.1	Sep 24, 2019		Soil	M19-Se42289		X	X		X	
19	TP23-0.1	Sep 24, 2019		Soil	M19-Se42290		X	X		X	
20	R01	Sep 24, 2019		Water	M19-Se42291				X		
21	FB01	Sep 24, 2019		Water	M19-Se42292				X		

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											X
Perth Laboratory - NATA Site # 23736											
22	TP01-0.3	Sep 24, 2019		Soil	M19-Se42293	X					
23	TP01-0.5	Sep 24, 2019		Soil	M19-Se42294	X					
24	TP02-0.3	Sep 24, 2019		Soil	M19-Se42295	X					
25	TP02-0.5	Sep 24, 2019		Soil	M19-Se42296	X					
26	TP03-0.3	Sep 24, 2019		Soil	M19-Se42297	X					
27	TP04-0.3	Sep 24, 2019		Soil	M19-Se42298	X					
28	TP04-0.5	Sep 24, 2019		Soil	M19-Se42299	X					
29	TP05-0.3	Sep 24, 2019		Soil	M19-Se42300	X					
30	TP06-0.3	Sep 24, 2019		Soil	M19-Se42301	X					
31	TP07-0.3	Sep 24, 2019		Soil	M19-Se42302	X					
32	TP07-0.5	Sep 24, 2019		Soil	M19-Se42303	X					
33	TP09-0.3	Sep 24, 2019		Soil	M19-Se42304	X					

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											X
Perth Laboratory - NATA Site # 23736											
34	TP09-0.5	Sep 24, 2019		Soil	M19-Se42305	X					
35	TP12-0.2	Sep 24, 2019		Soil	M19-Se42306	X					
36	TP12-0.5	Sep 24, 2019		Soil	M19-Se42307	X					
37	TP13-0.3	Sep 24, 2019		Soil	M19-Se42308	X					
38	TP13-0.5	Sep 24, 2019		Soil	M19-Se42309	X					
39	TP14-0.3	Sep 24, 2019		Soil	M19-Se42310	X					
40	TP15-0.6	Sep 24, 2019		Soil	M19-Se42311	X					
41	TP16-0.3	Sep 24, 2019		Soil	M19-Se42312	X					
42	TP16-0.5	Sep 24, 2019		Soil	M19-Se42313	X					
43	TP17-0.3	Sep 24, 2019		Soil	M19-Se42314	X					
44	TP17-0.5	Sep 24, 2019		Soil	M19-Se42315	X					
45	TP18-0.4	Sep 24, 2019		Soil	M19-Se42316	X					

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											X
Perth Laboratory - NATA Site # 23736											
46	TP21-0.5	Sep 24, 2019		Soil	M19-Se42317	X					
47	TP22-0.5	Sep 24, 2019		Soil	M19-Se42318	X					
48	TP23-0.6	Sep 24, 2019		Soil	M19-Se42319	X					
Test Counts						27	19	19	2	19	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram | **mg/L:** milligrams per litre | **ug/L:** micrograms per litre

ppm: Parts per million | **ppb:** Parts per billion | **%:** Percentage

org/100mL: Organisms per 100 millilitres | **NTU:** Nephelometric Turbidity Units | **MPN/100mL:** Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
% Clay	%	< 1			1	Pass	
Chromium (hexavalent)	mg/kg	< 1			1	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	< 10			10	Pass	
Total Organic Carbon	%	< 0.1			0.1	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Beryllium	mg/kg	< 2			2	Pass	
Boron	mg/kg	< 10			10	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Cobalt	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Iron	mg/kg	< 20			20	Pass	
Lead	mg/kg	< 5			5	Pass	
Manganese	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Selenium	mg/kg	< 2			2	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Heavy Metals							
Iron (%)	%	< 0.01			0.01	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	82			70-130	Pass	
4.4'-DDD	%	120			70-130	Pass	
4.4'-DDE	%	86			70-130	Pass	
4.4'-DDT	%	76			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
a-BHC	%	83			70-130	Pass	
Aldrin	%	92			70-130	Pass	
b-BHC	%	81			70-130	Pass	
d-BHC	%	81			70-130	Pass	
Dieldrin	%	97			70-130	Pass	
Endosulfan I	%	90			70-130	Pass	
Endosulfan II	%	76			70-130	Pass	
Endosulfan sulphate	%	74			70-130	Pass	
Endrin	%	75			70-130	Pass	
Endrin aldehyde	%	84			70-130	Pass	
Endrin ketone	%	77			70-130	Pass	
g-BHC (Lindane)	%	93			70-130	Pass	
Heptachlor	%	71			70-130	Pass	
Heptachlor epoxide	%	75			70-130	Pass	
Hexachlorobenzene	%	94			70-130	Pass	
Methoxychlor	%	75			70-130	Pass	
LCS - % Recovery							
% Clay	%	100			70-130	Pass	
Chromium (hexavalent)	%	93			70-130	Pass	
Total Organic Carbon	%	99			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	114			80-120	Pass	
Beryllium	%	114			80-120	Pass	
Boron	%	112			80-120	Pass	
Cadmium	%	93			80-120	Pass	
Cobalt	%	114			80-120	Pass	
Copper	%	111			80-120	Pass	
Iron	%	114			80-120	Pass	
Lead	%	118			80-120	Pass	
Manganese	%	112			80-120	Pass	
Mercury	%	120			75-125	Pass	
Nickel	%	109			80-120	Pass	
Selenium	%	117			80-120	Pass	
Zinc	%	111			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDT	M19-Se43280	NCP	%	80			70-130	Pass	
d-BHC	M19-Se43280	NCP	%	80			70-130	Pass	
Heptachlor	M19-Se43280	NCP	%	88			70-130	Pass	
Methoxychlor	M19-Se40936	NCP	%	80			70-130	Pass	
Spike - % Recovery									
				Result 1					
Chromium (hexavalent)	M19-Se42279	CP	%	96			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M19-Se42280	CP	%	79			75-125	Pass	
Beryllium	M19-Se42280	CP	%	97			75-125	Pass	
Boron	M19-Se42280	CP	%	93			75-125	Pass	
Cadmium	M19-Se42280	CP	%	81			75-125	Pass	
Cobalt	M19-Se42280	CP	%	97			75-125	Pass	
Copper	M19-Se42280	CP	%	93			75-125	Pass	
Lead	M19-Se42280	CP	%	97			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Manganese	M19-Se42280	CP	%	103			75-125	Pass	
Mercury	M19-Se42280	CP	%	102			70-130	Pass	
Nickel	M19-Se42280	CP	%	98			75-125	Pass	
Selenium	M19-Se42280	CP	%	82			75-125	Pass	
Zinc	M19-Se42280	CP	%	90			75-125	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	M19-Se42282	CP	%	78			70-130	Pass	
4.4'-DDD	M19-Se42282	CP	%	106			70-130	Pass	
4.4'-DDE	M19-Se42282	CP	%	84			70-130	Pass	
a-BHC	M19-Se42282	CP	%	71			70-130	Pass	
Aldrin	M19-Se42282	CP	%	78			70-130	Pass	
b-BHC	M19-Se42282	CP	%	124			70-130	Pass	
Dieldrin	M19-Se42282	CP	%	83			70-130	Pass	
Endosulfan I	M19-Se42282	CP	%	78			70-130	Pass	
Endosulfan II	M19-Se42282	CP	%	77			70-130	Pass	
Endosulfan sulphate	M19-Se42282	CP	%	82			70-130	Pass	
Endrin	M19-Se42282	CP	%	81			70-130	Pass	
Endrin aldehyde	M19-Se42282	CP	%	71			70-130	Pass	
Endrin ketone	M19-Se42282	CP	%	101			70-130	Pass	
g-BHC (Lindane)	M19-Se42282	CP	%	120			70-130	Pass	
Heptachlor epoxide	M19-Se42282	CP	%	72			70-130	Pass	
Hexachlorobenzene	M19-Se42282	CP	%	84			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M19-Se42272	CP	%	21	21	4.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Clay	S19-Au17878	NCP	%	1.3	1.3	<1	30%	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	M19-Oc04304	NCP	uS/cm	710	690	4.0	30%	Pass	
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	M19-Se42273	CP	pH Units	6.1	6.1	pass	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chromium (hexavalent)	M19-Se42278	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M19-Se42279	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Beryllium	M19-Se42279	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Boron	M19-Se42279	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Cadmium	M19-Se42279	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Cobalt	M19-Se42279	CP	mg/kg	12	12	3.0	30%	Pass	
Copper	M19-Se42279	CP	mg/kg	24	24	<1	30%	Pass	
Iron	M19-Se42279	CP	mg/kg	50000	48000	3.0	30%	Pass	
Lead	M19-Se42279	CP	mg/kg	23	23	1.0	30%	Pass	
Manganese	M19-Se42279	CP	mg/kg	440	500	13	30%	Pass	
Mercury	M19-Se42279	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	M19-Se42279	CP	mg/kg	25	27	8.0	30%	Pass	
Selenium	M19-Se42279	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Zinc	M19-Se42279	CP	mg/kg	24	25	5.0	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M19-Se42280	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Beryllium	M19-Se42280	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Boron	M19-Se42280	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Cadmium	M19-Se42280	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Cobalt	M19-Se42280	CP	mg/kg	12	12	<1	30%	Pass	
Copper	M19-Se42280	CP	mg/kg	25	25	<1	30%	Pass	
Iron	M19-Se42280	CP	mg/kg	28000	27000	1.0	30%	Pass	
Lead	M19-Se42280	CP	mg/kg	28	28	1.0	30%	Pass	
Manganese	M19-Se42280	CP	mg/kg	220	220	1.0	30%	Pass	
Mercury	M19-Se42280	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	M19-Se42280	CP	mg/kg	31	32	<1	30%	Pass	
Selenium	M19-Se42280	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Zinc	M19-Se42280	CP	mg/kg	36	36	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M19-Se42281	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	M19-Se42281	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	M19-Se42281	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	M19-Se42281	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	M19-Se42281	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	M19-Se42281	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	M19-Se42281	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	M19-Se42281	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	M19-Se42281	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	M19-Se42281	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	M19-Se42281	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	M19-Se42281	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	M19-Se42281	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	M19-Se42281	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	M19-Se42281	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	M19-Se42281	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	M19-Se42281	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	M19-Se42281	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	M19-Se42281	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	M19-Se42281	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M19-Se42282	CP	%	29	29	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Harry Bacalis	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Jonathon Angell	Senior Analyst-Inorganic (QLD)
Joseph Edouard	Senior Analyst-Organic (VIC)
Julie Kay	Senior Analyst-Inorganic (VIC)

Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Tonkin & Taylor P/L
Level 3, 99 Coventry St
Southbank
VIC 3006

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Rhian Owen**

Report **679598-W**
Project name
Project ID 1000571
Received Date Sep 26, 2019

Client Sample ID			**R01**	**FB01**
Sample Matrix			**Water**	**Water**
Eurofins Sample No.			**M19-Se42291**	**M19-Se42292**
Date Sampled			**Sep 24, 2019**	**Sep 24, 2019**
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01
BTEX				
Benzene	0.001	mg/L	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	123	129

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
BTEX and Naphthalene			
BTEX	Melbourne	Oct 01, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			

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NATA # 1261
Site # 23736

Company Name: Tonkin & Taylor P/L
Address: Level 3, 99 Coventry St
Southbank
VIC 3006

Project Name:
Project ID: 1000571

Order No.:
Report #: 679598
Phone: 03 9863 8686
Fax: 03 9863 8685

Received: Sep 26, 2019 4:47 PM
Due: Oct 4, 2019
Priority: 5 Day
Contact Name: Rhian Owen

Eurofins Analytical Services Manager : Harry Bacalis

Sample Detail						HOLD	Organochlorine Pesticides	NEPM 2013 Metals : Metals M13	BTEX and Naphthalene	Moisture Set	NEPM Screen for Soil Classification
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											X
Perth Laboratory - NATA Site # 23736											
External Laboratory											
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
1	TP01-0.1	Sep 24, 2019		Soil	M19-Se42272		X	X		X	
2	TP02-0.1	Sep 24, 2019		Soil	M19-Se42273		X	X		X	X
3	TP03-0.1	Sep 24, 2019		Soil	M19-Se42274		X	X		X	
4	TP04-0.1	Sep 24, 2019		Soil	M19-Se42275		X	X		X	
5	TP05-0.1	Sep 24, 2019		Soil	M19-Se42276		X	X		X	
6	TP06-0.1	Sep 24, 2019		Soil	M19-Se42277		X	X		X	
7	TP07-0.1	Sep 24, 2019		Soil	M19-Se42278		X	X		X	
8	TP09-0.1	Sep 24, 2019		Soil	M19-Se42279		X	X		X	
9	TP12-0.1	Sep 24, 2019		Soil	M19-Se42280		X	X		X	

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											X
Perth Laboratory - NATA Site # 23736											
10	TP13-0.1	Sep 24, 2019		Soil	M19-Se42281		X	X		X	
11	TP14-0.1	Sep 24, 2019		Soil	M19-Se42282		X	X		X	
12	TP15-0.1	Sep 24, 2019		Soil	M19-Se42283		X	X		X	
13	TP16-0.1	Sep 24, 2019		Soil	M19-Se42284		X	X		X	
14	QC01	Sep 24, 2019		Soil	M19-Se42285		X	X		X	
15	TP17-0.1	Sep 24, 2019		Soil	M19-Se42286		X	X		X	
16	TP18-0.1	Sep 24, 2019		Soil	M19-Se42287		X	X		X	
17	TP21-0.1	Sep 24, 2019		Soil	M19-Se42288		X	X		X	
18	TP22-0.1	Sep 24, 2019		Soil	M19-Se42289		X	X		X	
19	TP23-0.1	Sep 24, 2019		Soil	M19-Se42290		X	X		X	
20	R01	Sep 24, 2019		Water	M19-Se42291				X		
21	FB01	Sep 24, 2019		Water	M19-Se42292				X		

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Sample Detail						HOLD	Organochlorine Pesticides	NEPM 2013 Metals : Metals M13	BTEX and Naphthalene	Moisture Set	NEPM Screen for Soil Classification
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											X
Perth Laboratory - NATA Site # 23736											
22	TP01-0.3	Sep 24, 2019		Soil	M19-Se42293	X					
23	TP01-0.5	Sep 24, 2019		Soil	M19-Se42294	X					
24	TP02-0.3	Sep 24, 2019		Soil	M19-Se42295	X					
25	TP02-0.5	Sep 24, 2019		Soil	M19-Se42296	X					
26	TP03-0.3	Sep 24, 2019		Soil	M19-Se42297	X					
27	TP04-0.3	Sep 24, 2019		Soil	M19-Se42298	X					
28	TP04-0.5	Sep 24, 2019		Soil	M19-Se42299	X					
29	TP05-0.3	Sep 24, 2019		Soil	M19-Se42300	X					
30	TP06-0.3	Sep 24, 2019		Soil	M19-Se42301	X					
31	TP07-0.3	Sep 24, 2019		Soil	M19-Se42302	X					
32	TP07-0.5	Sep 24, 2019		Soil	M19-Se42303	X					
33	TP09-0.3	Sep 24, 2019		Soil	M19-Se42304	X					

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											X
Perth Laboratory - NATA Site # 23736											
34	TP09-0.5	Sep 24, 2019		Soil	M19-Se42305	X					
35	TP12-0.2	Sep 24, 2019		Soil	M19-Se42306	X					
36	TP12-0.5	Sep 24, 2019		Soil	M19-Se42307	X					
37	TP13-0.3	Sep 24, 2019		Soil	M19-Se42308	X					
38	TP13-0.5	Sep 24, 2019		Soil	M19-Se42309	X					
39	TP14-0.3	Sep 24, 2019		Soil	M19-Se42310	X					
40	TP15-0.6	Sep 24, 2019		Soil	M19-Se42311	X					
41	TP16-0.3	Sep 24, 2019		Soil	M19-Se42312	X					
42	TP16-0.5	Sep 24, 2019		Soil	M19-Se42313	X					
43	TP17-0.3	Sep 24, 2019		Soil	M19-Se42314	X					
44	TP17-0.5	Sep 24, 2019		Soil	M19-Se42315	X					
45	TP18-0.4	Sep 24, 2019		Soil	M19-Se42316	X					

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											X
Perth Laboratory - NATA Site # 23736											
46	TP21-0.5	Sep 24, 2019		Soil	M19-Se42317	X					
47	TP22-0.5	Sep 24, 2019		Soil	M19-Se42318	X					
48	TP23-0.6	Sep 24, 2019		Soil	M19-Se42319	X					
Test Counts						27	19	19	2	19	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	108			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	113			70-130	Pass	
Toluene	%	112			70-130	Pass	
Ethylbenzene	%	123			70-130	Pass	
m&p-Xylenes	%	122			70-130	Pass	
Xylenes - Total	%	121			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	N19-Oc00170	NCP	%	102			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	N19-Oc00170	NCP	%	102			70-130	Pass	
Toluene	N19-Oc00170	NCP	%	101			70-130	Pass	
Ethylbenzene	N19-Oc00170	NCP	%	109			70-130	Pass	
m&p-Xylenes	N19-Oc00170	NCP	%	109			70-130	Pass	
o-Xylene	N19-Oc00170	NCP	%	107			70-130	Pass	
Xylenes - Total	N19-Oc00170	NCP	%	108			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M19-Oc03540	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M19-Oc03540	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	M19-Oc03540	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M19-Oc03540	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M19-Oc03540	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	M19-Oc03540	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	M19-Oc03540	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.

Authorised By

Harry Bacalis	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)

Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Tonkin+Taylor

[illegible] Street, Southbank, Victoria 3006
Ph [illegible] Fax [illegible]

Chain of Custody (COC)

Sheet / of 4
Serial No. 2356

Laboratory: Eurofins	Address:
Project Name:	Project Manager: RKO
Sampled Name: T&T	Job Number: [illegible]

Comment/Instructions: [illegible]

Container Type & Preservation Codes: [illegible]

Sample ID	Sample Date	Time	Sample Matrix (e.g. soil, water etc)	Container/Preservative Type (e.g. glass, jar etc)	CHILLED, TICK IF YES	MI3 / OCPS	R21	R1	M3							Notes
[illegible]	28/8/08		Soil	Jar		X										
[illegible]	↓		↓	↓												
[illegible]																
[illegible]						X										
[illegible]																
[illegible]																
[illegible]						X	X									
[illegible]																
[illegible]																
[illegible]						X										
[illegible]																
[illegible]						X										
[illegible]																
[illegible]						X										
[illegible]																
[illegible]						X										
[illegible]																
[illegible]						X										
[illegible]																

Results Requested Within: [illegible] [illegible] [illegible]

Total

Relinquished By: T&T	Received By: [illegible]	Relinquished By:	Received By:
Signature: [illegible] Date:	Signature: [illegible] Date: [illegible]	Signature:	Signature: [illegible] Date: [illegible]
Company: T&T Time:	Company: [illegible] Time: [illegible]	Company:	Company: [illegible] Time: [illegible]

[illegible] 9.5

679599

Tonkin+Taylor

Ground Floor, [illegible] Street, [illegible]
Victoria 3006
Ph: 61 3 9853 8888 Fax: 61 3 [illegible]

Chain of Custody (COC)

Sheet 2 of 4

Serial No. 2357

Laboratory: Eurofins

Address:

Project Name:

Samplers Name: TGT

Project Manager: CKO

Job Number: [illegible]

Comment/Instructions:

See page 2

Container Type & Preservation Codes: [illegible]

Analysis Required: M13, OCPs; ASS; K1; M16

Sample ID	Sample Date	Time	Sample Matrix (e.g. soil, water etc)	Container/Preservation Type (e.g. glass, plastic)	CHILLED, TICK IF YES	M13, OCPs	ASS	K1	M16	Notes
[illegible]	25/9/17		Soil	Jar		X				
[illegible]										
[illegible]										
[illegible]						X				
[illegible]										
[illegible]						X				
[illegible]										
[illegible]										
[illegible]						X				
[illegible]										
[illegible]						X				
[illegible]										
[illegible]						X				
[illegible]										
[illegible]						X				
[illegible]										
[illegible]						X				
[illegible]										
[illegible]						X	X			

Results Requested Within: 24 hrs / 48 hrs / 5 days (circled)

Total:

Relinquished By: TGT		Received By: [illegible]		Relinquished By		Received By:	
Signature: [illegible]	Date	Signature: [illegible]	Date: 26/9	Signature		Signature: [illegible]	Date: 26/9
Company: T+T	Time	Company: EF	Time: 4:47pm	Company		Company: Eurofins	Time: 4:47pm

614579

Tonkin+Taylor

Ground Floor, 105 Carlton Gore ... Street, Southbank, Victoria 3006
Ph: 03 9696 3400 Fax: 61 3 9684 8585

Chain of Custody (COC)

Sheet 3 of 7

Serial No. 2358

Laboratory: Envirolab	Address:
Project Name:	Project Manager: KATH
Sampler Name: T&T	Job Number: 1006591

Comments/Instructions:

See page 1

Container Type & Preservation Codes: P - Plastic, G - Glass, ... N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved

Sample ID	Sample Date	Time	Sample Matrix (e.g. soil, water etc)	Container/Preservative Type (e.g. glass, plastic etc)	Metals, OCPs, MIS	E21	EI	MIS
TP11-02	23/7/19		Soil	Jar				
TP11-01	↓		↓	↓				
TP11-02								
TP40-01					X			
TP40-02								
TP41-01					X			
TP41-02					X			
R102								
R103								
TP42-01					X			
TP42-02					X			
R02			↓	↓	X			
FD02	↓		Water	3x vial			X	
TP10-01	24/7/19		Soil	Jar			X	
TP11-01								
CAT1					X			
TP19-01					X			
RAM1					X			
RAM2	↓		↓	↓	X			

Results Required Within: 24hrs 48hrs 5days (circled)

Total:

Notes:

Relinquished By: T&T		Received By: Envirolab		Relinquished By		Received By:	
Signature: [signature]	Date	Signature: [signature]	Date: 25/7	Signature		Signature: [signature]	Date: 26/9
Company: T&T	Time	Company: ELS	Time: 4:45pm	Company		Company: Envirolab	Time: 9:45pm

Tonkin+Taylor

Level 4 [illegible], 55 Coventry Street, Southbank, Victoria 3006
Ph [illegible] Fax [illegible]

Chain of Custody (COC)

Sheet 4 of 4

No. 2359

Laboratory: Eurofins

Address:

Project name:

Project Manager: CKB

Samplers Name: TNT

Job Number: 1006 T.H

Comment/Instructions: See type Z

Container Type & Preservation Codes: [illegible]

Sample ID	Sample Date	Time	Sample Matrix (e.g. soil, water etc)	Container/Preservative Type (e.g. glass, so/ etc)	CHILLED, RICH # 105	MH, OCP	021	PAH
DEAH/2	21/7/17		SOIL	JAR		X		
DEAH/2	↓		↓	↓		X		
DEAH/3	↓		↓	↓		X		
CD1	↓		WATER	VIAL				X
CB03	↓		↓	↓				X

Results Required (Date): [illegible] Total:

Relinquished By: FBT		Received by: Craig TS		Relinquished By:		Received By:	
Signature: [signature]	Date:	Signature: [signature] 20/7	Date:	Signature:		Signature: [signature]	Date: 21/5
Company: TNT	Time:	Company: EF 4:45pm	Time:	Company:		Company: Eurofins	Time: 5:17pm

[illegible] 795[illegible]

Enviro Sample Vic

From: Harry Bacalis
Sent: Tuesday, 1 October 2019 9:40 AM
To: Rhian Owen
Cc: Enviro Sample Vic; Catherine Wilson
Subject: RE: Eurofins Sample Receipt Advice - Report 679599 : Site 1000511

No worries Rhian

Canh – Can you make the following changes below?

Kind regards,

Harry Bacalis
Phone: +61 3 8564 5064
Mobile: +61 438 858 924
Email : HarryBacalis@eurofins.com

From: Rhian Owen [mailto:ROwen@tonkintaylor.com.au]
Sent: Tuesday, 1 October 2019 9:35 AM
To: Harry Bacalis
Subject: FW: Eurofins Sample Receipt Advice - Report 679599 : Site 1000511

EXTERNAL EMAIL*

Hi Harry

Could you please test the vials for BTEXN? For Report 679598 also please.

Also, this one *"Eurofins Sample Receipt Advice - Report 679598 : Site 1000571"*

Is also Site 1000511.

Thanks

Rhian Owen
T +61 3 9863 8688 M +61 447 540 473

From: EnviroSampleVic@eurofins.com <EnviroSampleVic@eurofins.com>
Sent: Saturday, 28 September 2019 8:49 AM
To: Rhian Owen <ROwen@tonkintaylor.com.au>
Subject: Eurofins Sample Receipt Advice - Report 679599 : Site 1000511

Dear Valued Client,
CAN'T DO METAL ANALYSIS WITH VIAL

Please find attached a Sample Receipt Advice (SRA), a Summary Sheet and a scanned copy of your Chain-of-Custody (COC). It is important that you check this documentation to ensure that the details are correct such as the Client Job Number, Turn Around Time, any comments in the Notes section and sample numbers as well as the requested analysis. If there are any irregularities then please contact your Eurofins Analytical Services Manager as soon as possible to make certain that they get changed.

Kind Regards
Adlin George

Eurofins | mgt
6 Monterey Road
Dandenong South
Austalia
Phone: +61 3 85645043

EnviroNote 1079 - PFAS Fingerprinting
EnviroNote 1080 - Total Organofluorine Analysis & PFAS Investigations

eurofins | Environment Testing

Melbourne
6 Monterey Road
Dandenong South Vic 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**Tonkin & Taylor P/L**
Contact name:	Rhian Owen
Project ID:	1000511
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Sep 26, 2019 4:47 PM
Eurofins reference:	**679599**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

CAN'T DO METAL ANALYSIS WITH VIAL

Contact notes

If you have any questions with respect to these samples please contact:

Harry Bacalis on Phone : or by e.mail: HarryBacalis@eurofins.com

Results will be delivered electronically via e.mail to Rhian Owen - rowen@tonkintaylor.com.au.

Tonkin & Taylor P/L
Level 3, 99 Coventry St
Southbank
VIC 3006

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Rhian Owen**

Report **679599-S**
Project name
Project ID 1000511
Received Date Sep 26, 2019

Client Sample ID			**TP08_0.1**	**TP20_0.1**	**TP24_0.1**	**TP25_0.1**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**M19-Se42320**	**M19-Se42321**	**M19-Se42322**	**M19-Se42323**
Date Sampled			**Sep 25, 2019**	**Sep 25, 2019**	**Sep 25, 2019**	**Sep 25, 2019**
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	86	88	94	88
Tetrachloro-m-xylene (surr.)	1	%	67	62	69	63
% Clay	1	%	-	-	9.0	-
Chromium (hexavalent)	1	mg/kg	< 1	< 1	< 1	< 1
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	-	-	200	-
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	-	-	6.1	-
Total Organic Carbon	0.1	%	-	-	6.1	-
% Moisture	1	%	32	31	30	28

Client Sample ID			TP08_0.1	TP20_0.1	TP24_0.1	TP25_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Se42320	M19-Se42321	M19-Se42322	M19-Se42323
Date Sampled			Sep 25, 2019	Sep 25, 2019	Sep 25, 2019	Sep 25, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	< 2	< 2
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Cobalt	5	mg/kg	30	33	68	97
Copper	5	mg/kg	48	33	36	29
Iron	20	mg/kg	-	-	48000	-
Lead	5	mg/kg	16	19	19	18
Manganese	5	mg/kg	690	880	1800	4000
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	55	43	62	68
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Zinc	5	mg/kg	46	28	37	24
Heavy Metals						
Iron (%)	0.01	%	-	-	4.8	-
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	-	39	-

Client Sample ID			TP26_0.1	TP27_0.1	TP28_0.1	TP29_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Se42324	M19-Se42325	M19-Se42326	M19-Se42327
Date Sampled			Sep 25, 2019	Sep 25, 2019	Sep 25, 2019	Sep 25, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			TP26_0.1	TP27_0.1	TP28_0.1	TP29_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Se42324	M19-Se42325	M19-Se42326	M19-Se42327
Date Sampled			Sep 25, 2019	Sep 25, 2019	Sep 25, 2019	Sep 25, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	86	83	93	97
Tetrachloro-m-xylene (surr.)	1	%	69	62	67	66
Chromium (hexavalent)	1	mg/kg	< 1	< 1	< 1	< 1
% Moisture	1	%	29	31	35	30
Heavy Metals						
Arsenic	2	mg/kg	2.6	< 2	< 2	< 2
Beryllium	2	mg/kg	2.2	2.7	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	1.0	< 0.4	< 0.4	< 0.4
Cobalt	5	mg/kg	380	83	65	240
Copper	5	mg/kg	62	44	60	63
Lead	5	mg/kg	17	18	16	9.9
Manganese	5	mg/kg	8800	1200	2500	6200
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	230	56	110	170
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Zinc	5	mg/kg	65	59	70	63

Client Sample ID			TP30_0.1	TP31_0.1	TP32_0.1	TP33_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Se42328	M19-Se42329	M19-Se42330	M19-Se42331
Date Sampled			Sep 25, 2019	Sep 25, 2019	Sep 25, 2019	Sep 25, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			TP30_0.1	TP31_0.1	TP32_0.1	TP33_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Se42328	M19-Se42329	M19-Se42330	M19-Se42331
Date Sampled			Sep 25, 2019	Sep 25, 2019	Sep 25, 2019	Sep 25, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	95	95	96	104
Tetrachloro-m-xylene (surr.)	1	%	69	66	66	112
Chromium (hexavalent)	1	mg/kg	< 1	< 1	< 1	< 1
% Moisture	1	%	34	38	32	31
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	2.0	2.1
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Cobalt	5	mg/kg	54	46	67	54
Copper	5	mg/kg	63	55	73	72
Lead	5	mg/kg	15	15	15	14
Manganese	5	mg/kg	2100	1400	2300	2100
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	130	99	120	110
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Zinc	5	mg/kg	68	59	71	68

Client Sample ID			TP34_0.1	TP35_0.1	TP36_0.1	TP37_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Se42332	M19-Se42333	M19-Se42334	M19-Se42335
Date Sampled			Sep 25, 2019	Sep 25, 2019	Sep 25, 2019	Sep 25, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			TP34_0.1	TP35_0.1	TP36_0.1	TP37_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Se42332	M19-Se42333	M19-Se42334	M19-Se42335
Date Sampled			Sep 25, 2019	Sep 25, 2019	Sep 25, 2019	Sep 25, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	101	109	109	102
Tetrachloro-m-xylene (surr.)	1	%	114	115	118	115
Chromium (hexavalent)	1	mg/kg	< 1	< 1	< 1	< 1
% Moisture	1	%	32	30	37	31
Heavy Metals						
Arsenic	2	mg/kg	< 2	2.3	< 2	< 2
Beryllium	2	mg/kg	< 2	3.8	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Cobalt	5	mg/kg	51	190	46	31
Copper	5	mg/kg	47	68	51	70
Lead	5	mg/kg	17	13	19	18
Manganese	5	mg/kg	1600	4200	1100	4900
Mercury	0.1	mg/kg	< 0.1	0.1	0.1	0.1
Nickel	5	mg/kg	60	180	68	97
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Zinc	5	mg/kg	50	130	57	72

Client Sample ID			TP38_0.1	TP39_0.1	TP40_0.1	TP41_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Se42336	M19-Se42337	M19-Se42338	M19-Se42339
Date Sampled			Sep 25, 2019	Sep 25, 2019	Sep 25, 2019	Sep 25, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			TP38_0.1	TP39_0.1	TP40_0.1	TP41_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Se42336	M19-Se42337	M19-Se42338	M19-Se42339
Date Sampled			Sep 25, 2019	Sep 25, 2019	Sep 25, 2019	Sep 25, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	113	103	110	107
Tetrachloro-m-xylene (surr.)	1	%	118	115	119	119
% Clay	1	%	10	-	-	-
Chromium (hexavalent)	1	mg/kg	< 1	< 1	< 1	< 1
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	110	-	-	-
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	6.5	-	-	-
Total Organic Carbon	0.1	%	6.9	-	-	-
% Moisture	1	%	33	32	29	29
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	< 2	< 2
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Cobalt	5	mg/kg	35	68	51	11
Copper	5	mg/kg	65	50	49	52
Iron	20	mg/kg	120000	-	-	-
Lead	5	mg/kg	15	18	17	17
Manganese	5	mg/kg	1800	2100	1400	710
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	58	73	73	59
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Zinc	5	mg/kg	48	67	73	48
Heavy Metals						
Iron (%)	0.01	%	12	-	-	-
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	27	-	-	-

Client Sample ID			QC02	QC03	TP42_0.1	TP10_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Se42340	M19-Se42341	M19-Se42342	M19-Se42345
Date Sampled			Sep 25, 2019	Sep 25, 2019	Sep 25, 2019	Sep 25, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			QC02	QC03	TP42_0.1	TP10_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Se42340	M19-Se42341	M19-Se42342	M19-Se42345
Date Sampled			Sep 25, 2019	Sep 25, 2019	Sep 25, 2019	Sep 25, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	107	122	147	142
Tetrachloro-m-xylene (surr.)	1	%	116	78	88	91
Chromium (hexavalent)	1	mg/kg	< 1	< 1	< 1	< 1
% Moisture	1	%	27	30	35	30
Heavy Metals						
Arsenic	2	mg/kg	< 2	2.0	2.0	< 2
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Boron	10	mg/kg	< 10	< 10	12	12
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Cobalt	5	mg/kg	460	12	25	35
Copper	5	mg/kg	43	54	58	50
Lead	5	mg/kg	19	17	21	17
Manganese	5	mg/kg	9500	740	2500	750
Mercury	0.1	mg/kg	< 0.1	< 0.1	0.1	< 0.1
Nickel	5	mg/kg	170	60	75	56
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Zinc	5	mg/kg	46	50	72	69

Client Sample ID			TP11_0.1	CAT 1	TP19_0.1	DAM 1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Se42346	M19-Se42347	M19-Se42348	M19-Se42349
Date Sampled			Sep 25, 2019	Sep 25, 2019	Sep 25, 2019	Sep 25, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	-	-	< 20
TRH C10-C14	20	mg/kg	-	-	-	< 20
TRH C15-C28	50	mg/kg	-	-	-	< 50
TRH C29-C36	50	mg/kg	-	-	-	< 50
TRH C10-C36 (Total)	50	mg/kg	-	-	-	< 50

Client Sample ID			TP11_0.1	CAT 1	TP19_0.1	DAM 1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Se42346	M19-Se42347	M19-Se42348	M19-Se42349
Date Sampled			Sep 25, 2019	Sep 25, 2019	Sep 25, 2019	Sep 25, 2019
Test/Reference	LOR	Unit				
Volatile Organics						
1.2.4-Trichlorobenzene	0.5	mg/kg	-	-	-	< 0.5
Hexachlorobutadiene	0.5	mg/kg	-	-	-	< 0.5
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	-	-	-	< 0.5
1.1-Dichloroethene	0.5	mg/kg	-	-	-	< 0.5
1.1.1-Trichloroethane	0.5	mg/kg	-	-	-	< 0.5
1.1.1.2-Tetrachloroethane	0.5	mg/kg	-	-	-	< 0.5
1.1.2-Trichloroethane	0.5	mg/kg	-	-	-	< 0.5
1.1.2.2-Tetrachloroethane	0.5	mg/kg	-	-	-	< 0.5
1.2-Dibromoethane	0.5	mg/kg	-	-	-	< 0.5
1.2-Dichlorobenzene	0.5	mg/kg	-	-	-	< 0.5
1.2-Dichloroethane	0.5	mg/kg	-	-	-	< 0.5
1.2-Dichloropropane	0.5	mg/kg	-	-	-	< 0.5
1.2.3-Trichloropropane	0.5	mg/kg	-	-	-	< 0.5
1.2.4-Trimethylbenzene	0.5	mg/kg	-	-	-	< 0.5
1.3-Dichlorobenzene	0.5	mg/kg	-	-	-	< 0.5
1.3-Dichloropropane	0.5	mg/kg	-	-	-	< 0.5
1.3.5-Trimethylbenzene	0.5	mg/kg	-	-	-	< 0.5
1.4-Dichlorobenzene	0.5	mg/kg	-	-	-	< 0.5
2-Butanone (MEK)	0.5	mg/kg	-	-	-	< 0.5
2-Propanone (Acetone)	0.5	mg/kg	-	-	-	< 0.5
4-Chlorotoluene	0.5	mg/kg	-	-	-	< 0.5
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	-	-	-	< 0.5
Allyl chloride	0.5	mg/kg	-	-	-	< 0.5
Benzene	0.1	mg/kg	-	-	-	< 0.1
Bromobenzene	0.5	mg/kg	-	-	-	< 0.5
Bromochloromethane	0.5	mg/kg	-	-	-	< 0.5
Bromodichloromethane	0.5	mg/kg	-	-	-	< 0.5
Bromoform	0.5	mg/kg	-	-	-	< 0.5
Bromomethane	0.5	mg/kg	-	-	-	< 0.5
Carbon disulfide	0.5	mg/kg	-	-	-	< 0.5
Carbon Tetrachloride	0.5	mg/kg	-	-	-	< 0.5
Chlorobenzene	0.5	mg/kg	-	-	-	< 0.5
Chloroethane	0.5	mg/kg	-	-	-	< 0.5
Chloroform	0.5	mg/kg	-	-	-	< 0.5
Chloromethane	0.5	mg/kg	-	-	-	< 0.5
cis-1.2-Dichloroethene	0.5	mg/kg	-	-	-	< 0.5
cis-1.3-Dichloropropene	0.5	mg/kg	-	-	-	< 0.5
Dibromochloromethane	0.5	mg/kg	-	-	-	< 0.5
Dibromomethane	0.5	mg/kg	-	-	-	< 0.5
Dichlorodifluoromethane	0.5	mg/kg	-	-	-	< 0.5
Ethylbenzene	0.1	mg/kg	-	-	-	< 0.1
Iodomethane	0.5	mg/kg	-	-	-	< 0.5
Isopropyl benzene (Cumene)	0.5	mg/kg	-	-	-	< 0.5
m&p-Xylenes	0.2	mg/kg	-	-	-	< 0.2
Methylene Chloride	0.5	mg/kg	-	-	-	< 0.5
o-Xylene	0.1	mg/kg	-	-	-	< 0.1
Styrene	0.5	mg/kg	-	-	-	< 0.5
Tetrachloroethene	0.5	mg/kg	-	-	-	< 0.5

Client Sample ID			TP11_0.1	CAT 1	TP19_0.1	DAM 1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Se42346	M19-Se42347	M19-Se42348	M19-Se42349
Date Sampled			Sep 25, 2019	Sep 25, 2019	Sep 25, 2019	Sep 25, 2019
Test/Reference	LOR	Unit				
Volatile Organics						
Toluene	0.1	mg/kg	-	-	-	< 0.1
trans-1.2-Dichloroethene	0.5	mg/kg	-	-	-	< 0.5
trans-1.3-Dichloropropene	0.5	mg/kg	-	-	-	< 0.5
Trichloroethene	0.5	mg/kg	-	-	-	< 0.5
Trichlorofluoromethane	0.5	mg/kg	-	-	-	< 0.5
Vinyl chloride	0.5	mg/kg	-	-	-	< 0.5
Xylenes - Total	0.3	mg/kg	-	-	-	< 0.3
Total MAH*	0.5	mg/kg	-	-	-	< 0.5
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	-	-	-	< 0.5
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	-	-	-	< 0.5
4-Bromofluorobenzene (surr.)	1	%	-	-	-	105
Toluene-d8 (surr.)	1	%	-	-	-	82
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	-	-	< 0.5
TRH C6-C10	20	mg/kg	-	-	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	-	-	< 20
TRH >C10-C16	50	mg/kg	-	-	-	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	-	-	< 50
TRH >C16-C34	100	mg/kg	-	-	-	< 100
TRH >C34-C40	100	mg/kg	-	-	-	< 100
TRH >C10-C40 (total)*	100	mg/kg	-	-	-	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	-	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	-	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	-	-	1.2
Acenaphthene	0.5	mg/kg	-	-	-	< 0.5
Acenaphthylene	0.5	mg/kg	-	-	-	< 0.5
Anthracene	0.5	mg/kg	-	-	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	-	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	-	-	-	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	-	-	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	-	-	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	-	-	< 0.5
Chrysene	0.5	mg/kg	-	-	-	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	-	-	-	< 0.5
Fluoranthene	0.5	mg/kg	-	-	-	< 0.5
Fluorene	0.5	mg/kg	-	-	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	-	-	< 0.5
Naphthalene	0.5	mg/kg	-	-	-	< 0.5
Phenanthrene	0.5	mg/kg	-	-	-	< 0.5
Pyrene	0.5	mg/kg	-	-	-	< 0.5
Total PAH*	0.5	mg/kg	-	-	-	< 0.5
2-Fluorobiphenyl (surr.)	1	%	-	-	-	81
p-Terphenyl-d14 (surr.)	1	%	-	-	-	97
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			TP11_0.1	CAT 1	TP19_0.1	DAM 1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Se42346	M19-Se42347	M19-Se42348	M19-Se42349
Date Sampled			Sep 25, 2019	Sep 25, 2019	Sep 25, 2019	Sep 25, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	115	124	139	126
Tetrachloro-m-xylene (surr.)	1	%	78	81	83	80
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1221	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1232	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1242	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1248	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1254	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1260	0.1	mg/kg	-	-	-	< 0.1
Total PCB*	0.1	mg/kg	-	-	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	-	-	126
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	80
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	-	-	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	-	-	-	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	-	-	-	< 1
2.4.6-Trichlorophenol	1	mg/kg	-	-	-	< 1
2.6-Dichlorophenol	0.5	mg/kg	-	-	-	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	-	-	-	< 1
Pentachlorophenol	1	mg/kg	-	-	-	< 1
Tetrachlorophenols - Total	10	mg/kg	-	-	-	< 10
Total Halogenated Phenol*	1	mg/kg	-	-	-	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	-	-	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	-	-	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	-	-	< 0.2
2-Nitrophenol	1.0	mg/kg	-	-	-	< 1

Client Sample ID			TP11_0.1	CAT 1	TP19_0.1	DAM 1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Se42346	M19-Se42347	M19-Se42348	M19-Se42349
Date Sampled			Sep 25, 2019	Sep 25, 2019	Sep 25, 2019	Sep 25, 2019
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
2.4-Dimethylphenol	0.5	mg/kg	-	-	-	< 0.5
2.4-Dinitrophenol	5	mg/kg	-	-	-	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	-	-	< 0.4
4-Nitrophenol	5	mg/kg	-	-	-	< 5
Dinoseb	20	mg/kg	-	-	-	< 20
Phenol	0.5	mg/kg	-	-	-	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	-	-	-	< 20
Phenol-d6 (surr.)	1	%	-	-	-	66
Chromium (hexavalent)	1	mg/kg	< 1	< 1	< 1	< 1
Cyanide (total)	5	mg/kg	-	-	-	< 5
Fluoride (Total)	100	mg/kg	-	-	-	330
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	-	-	-	7.3
% Moisture	1	%	26	27	27	27
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	< 2	< 2
Beryllium	2	mg/kg	2.2	2.1	< 2	-
Boron	10	mg/kg	< 10	< 10	< 10	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	-	-	-	91
Cobalt	5	mg/kg	40	35	< 5	-
Copper	5	mg/kg	75	75	13	37
Lead	5	mg/kg	20	20	10	20
Manganese	5	mg/kg	1000	850	150	-
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	-	-	-	< 5
Nickel	5	mg/kg	62	62	9.4	48
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Silver	0.2	mg/kg	-	-	-	< 0.2
Tin	10	mg/kg	-	-	-	< 10
Zinc	5	mg/kg	78	75	12	39

Client Sample ID			DAM 2	DRAIN 1	DRAIN 2	DRAIN 3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Se42350	M19-Se42351	M19-Se42352	M19-Se42353
Date Sampled			Sep 25, 2019	Sep 25, 2019	Sep 25, 2019	Sep 25, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	-	-	-
TRH C10-C14	20	mg/kg	< 20	-	-	-
TRH C15-C28	50	mg/kg	< 50	-	-	-
TRH C29-C36	50	mg/kg	< 50	-	-	-
TRH C10-C36 (Total)	50	mg/kg	< 50	-	-	-
Volatile Organics						
1.2.4-Trichlorobenzene	0.5	mg/kg	< 0.5	-	-	-
Hexachlorobutadiene	0.5	mg/kg	< 0.5	-	-	-

Client Sample ID			DAM 2	DRAIN 1	DRAIN 2	DRAIN 3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Se42350	M19-Se42351	M19-Se42352	M19-Se42353
Date Sampled			Sep 25, 2019	Sep 25, 2019	Sep 25, 2019	Sep 25, 2019
Test/Reference	LOR	Unit				
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1-Dichloroethene	0.5	mg/kg	< 0.5	-	-	-
1.1.1-Trichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1.1.2-Tetrachloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1.2-Trichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1.2.2-Tetrachloroethane	0.5	mg/kg	< 0.5	-	-	-
1.2-Dibromoethane	0.5	mg/kg	< 0.5	-	-	-
1.2-Dichlorobenzene	0.5	mg/kg	< 0.5	-	-	-
1.2-Dichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.2-Dichloropropane	0.5	mg/kg	< 0.5	-	-	-
1.2.3-Trichloropropane	0.5	mg/kg	< 0.5	-	-	-
1.2.4-Trimethylbenzene	0.5	mg/kg	< 0.5	-	-	-
1.3-Dichlorobenzene	0.5	mg/kg	< 0.5	-	-	-
1.3-Dichloropropane	0.5	mg/kg	< 0.5	-	-	-
1.3.5-Trimethylbenzene	0.5	mg/kg	< 0.5	-	-	-
1.4-Dichlorobenzene	0.5	mg/kg	< 0.5	-	-	-
2-Butanone (MEK)	0.5	mg/kg	< 0.5	-	-	-
2-Propanone (Acetone)	0.5	mg/kg	< 0.5	-	-	-
4-Chlorotoluene	0.5	mg/kg	< 0.5	-	-	-
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	< 0.5	-	-	-
Allyl chloride	0.5	mg/kg	< 0.5	-	-	-
Benzene	0.1	mg/kg	< 0.1	-	-	-
Bromobenzene	0.5	mg/kg	< 0.5	-	-	-
Bromochloromethane	0.5	mg/kg	< 0.5	-	-	-
Bromodichloromethane	0.5	mg/kg	< 0.5	-	-	-
Bromoform	0.5	mg/kg	< 0.5	-	-	-
Bromomethane	0.5	mg/kg	< 0.5	-	-	-
Carbon disulfide	0.5	mg/kg	< 0.5	-	-	-
Carbon Tetrachloride	0.5	mg/kg	< 0.5	-	-	-
Chlorobenzene	0.5	mg/kg	< 0.5	-	-	-
Chloroethane	0.5	mg/kg	< 0.5	-	-	-
Chloroform	0.5	mg/kg	< 0.5	-	-	-
Chloromethane	0.5	mg/kg	< 0.5	-	-	-
cis-1.2-Dichloroethene	0.5	mg/kg	< 0.5	-	-	-
cis-1.3-Dichloropropene	0.5	mg/kg	< 0.5	-	-	-
Dibromochloromethane	0.5	mg/kg	< 0.5	-	-	-
Dibromomethane	0.5	mg/kg	< 0.5	-	-	-
Dichlorodifluoromethane	0.5	mg/kg	< 0.5	-	-	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	-	-
Iodomethane	0.5	mg/kg	< 0.5	-	-	-
Isopropyl benzene (Cumene)	0.5	mg/kg	< 0.5	-	-	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	-	-
Methylene Chloride	0.5	mg/kg	< 0.5	-	-	-
o-Xylene	0.1	mg/kg	< 0.1	-	-	-
Styrene	0.5	mg/kg	< 0.5	-	-	-
Tetrachloroethene	0.5	mg/kg	< 0.5	-	-	-
Toluene	0.1	mg/kg	< 0.1	-	-	-
trans-1.2-Dichloroethene	0.5	mg/kg	< 0.5	-	-	-
trans-1.3-Dichloropropene	0.5	mg/kg	< 0.5	-	-	-

Client Sample ID			DAM 2	DRAIN 1	DRAIN 2	DRAIN 3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Se42350	M19-Se42351	M19-Se42352	M19-Se42353
Date Sampled			Sep 25, 2019	Sep 25, 2019	Sep 25, 2019	Sep 25, 2019
Test/Reference	LOR	Unit				
Volatile Organics						
Trichloroethene	0.5	mg/kg	< 0.5	-	-	-
Trichlorofluoromethane	0.5	mg/kg	< 0.5	-	-	-
Vinyl chloride	0.5	mg/kg	< 0.5	-	-	-
Xylenes - Total	0.3	mg/kg	< 0.3	-	-	-
Total MAH*	0.5	mg/kg	< 0.5	-	-	-
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	< 0.5	-	-	-
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	< 0.5	-	-	-
4-Bromofluorobenzene (surr.)	1	%	96	-	-	-
Toluene-d8 (surr.)	1	%	77	-	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	-	-
TRH C6-C10	20	mg/kg	< 20	-	-	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	-	-
TRH >C10-C16	50	mg/kg	< 50	-	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	-	-
TRH >C16-C34	100	mg/kg	< 100	-	-	-
TRH >C34-C40	100	mg/kg	< 100	-	-	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	-	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	-	-
Acenaphthene	0.5	mg/kg	< 0.5	-	-	-
Acenaphthylene	0.5	mg/kg	< 0.5	-	-	-
Anthracene	0.5	mg/kg	< 0.5	-	-	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	-	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	-	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	-	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	-	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	-	-
Chrysene	0.5	mg/kg	< 0.5	-	-	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	-	-
Fluoranthene	0.5	mg/kg	< 0.5	-	-	-
Fluorene	0.5	mg/kg	< 0.5	-	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	-	-
Naphthalene	0.5	mg/kg	< 0.5	-	-	-
Phenanthrene	0.5	mg/kg	< 0.5	-	-	-
Pyrene	0.5	mg/kg	< 0.5	-	-	-
Total PAH*	0.5	mg/kg	< 0.5	-	-	-
2-Fluorobiphenyl (surr.)	1	%	80	-	-	-
p-Terphenyl-d14 (surr.)	1	%	100	-	-	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			DAM 2	DRAIN 1	DRAIN 2	DRAIN 3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Se42350	M19-Se42351	M19-Se42352	M19-Se42353
Date Sampled			Sep 25, 2019	Sep 25, 2019	Sep 25, 2019	Sep 25, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	129	119	135	131
Tetrachloro-m-xylene (surr.)	1	%	83	81	84	84
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1232	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1242	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1248	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1254	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1260	0.1	mg/kg	< 0.1	-	-	-
Total PCB*	0.1	mg/kg	< 0.1	-	-	-
Dibutylchlorendate (surr.)	1	%	129	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	83	-	-	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	-	-	-
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	-
2.4.5-Trichlorophenol	1	mg/kg	< 1	-	-	-
2.4.6-Trichlorophenol	1	mg/kg	< 1	-	-	-
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	-
4-Chloro-3-methylphenol	1	mg/kg	< 1	-	-	-
Pentachlorophenol	1	mg/kg	< 1	-	-	-
Tetrachlorophenols - Total	10	mg/kg	< 10	-	-	-
Total Halogenated Phenol*	1	mg/kg	< 1	-	-	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	-	-	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	-	-	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	-	-	-
2-Nitrophenol	1.0	mg/kg	< 1	-	-	-
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	-	-	-
2.4-Dinitrophenol	5	mg/kg	< 5	-	-	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	-	-	-

Client Sample ID			DAM 2	DRAIN 1	DRAIN 2	DRAIN 3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Se42350	M19-Se42351	M19-Se42352	M19-Se42353
Date Sampled			Sep 25, 2019	Sep 25, 2019	Sep 25, 2019	Sep 25, 2019
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
4-Nitrophenol	5	mg/kg	< 5	-	-	-
Dinoseb	20	mg/kg	< 20	-	-	-
Phenol	0.5	mg/kg	< 0.5	-	-	-
Total Non-Halogenated Phenol*	20	mg/kg	< 20	-	-	-
Phenol-d6 (surr.)	1	%	69	-	-	-
Chromium (hexavalent)	1	mg/kg	< 1	< 1	< 1	< 1
Cyanide (total)	5	mg/kg	< 5	-	-	-
Fluoride (Total)	100	mg/kg	200	-	-	-
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	7.4	-	-	-
% Moisture	1	%	32	29	34	27
Heavy Metals						
Arsenic	2	mg/kg	2.6	2.1	2.6	2.8
Beryllium	2	mg/kg	-	< 2	< 2	< 2
Boron	10	mg/kg	-	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	200	-	-	-
Cobalt	5	mg/kg	-	27	23	17
Copper	5	mg/kg	68	29	33	20
Lead	5	mg/kg	18	19	75	24
Manganese	5	mg/kg	-	900	420	310
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	-	-	-
Nickel	5	mg/kg	75	55	40	26
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Silver	0.2	mg/kg	< 0.2	-	-	-
Tin	10	mg/kg	< 10	-	-	-
Zinc	5	mg/kg	83	40	100	280

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Vic EPA IWRG 621 (Solids)			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Oct 03, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Volatile Organics	Melbourne	Oct 03, 2019	7 Days
- Method: USEPA 8260 - MGT 350A Volatile Organics by GCMS			
Volatile Organics	Melbourne	Oct 03, 2019	7 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices (USEPA 8260)			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Oct 03, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Oct 03, 2019	
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Melbourne	Oct 03, 2019	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Organochlorine Pesticides	Melbourne	Oct 03, 2019	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8270)			
Polychlorinated Biphenyls	Melbourne	Oct 03, 2019	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8082)			
Phenols (Halogenated)	Melbourne	Oct 03, 2019	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (non-Halogenated)	Melbourne	Oct 03, 2019	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Chromium (hexavalent)	Melbourne	Oct 03, 2019	28 Days
- Method: APHA 3500-Cr Hexavalent Chromium- (Extraction:- USEPA3060)			
Cyanide (total)	Melbourne	Oct 03, 2019	14 Days
- Method: LTM-INO-4020 Total Free WAD Cyanide by CFA			
Fluoride (Total)	Melbourne	Oct 04, 2019	28 Days
- Method: LTM-INO-4150 Determination of Total Fluoride PART B – ISE			
pH (1:5 Aqueous extract at 25°C as rec.)	Melbourne	Oct 03, 2019	7 Days
- Method: LTM-GEN-7090 pH in soil by ISE			
Metals IWRG 621 : Metals M12	Melbourne	Oct 03, 2019	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
NEPM Screen for Soil Classification			
% Clay	Brisbane	Oct 03, 2019	0 Days
- Method: LTM-GEN-7040			
Conductivity (1:5 aqueous extract at 25°C as rec.)	Melbourne	Oct 03, 2019	7 Days
- Method: LTM-INO-4030 Conductivity			
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	Melbourne	Oct 03, 2019	7 Days
- Method: LTM-GEN-7090 pH in soil by ISE			
Total Organic Carbon	Melbourne	Oct 04, 2019	28 Days
- Method: LTM-INO-4060 Total Organic Carbon in water and soil			
Heavy Metals	Melbourne	Oct 03, 2019	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Cation Exchange Capacity	Melbourne	Oct 04, 2019	180 Days
- Method: LTM-MET-3060 Cation Exchange Capacity by bases & Exchangeable Sodium Percentage			
% Moisture	Melbourne	Sep 28, 2019	14 Days
- Method: LTM-GEN-7080 Moisture			

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Site # 23736

Company Name: Tonkin & Taylor P/L
Address: Level 3, 99 Coventry St
Southbank
VIC 3006

Project Name:
Project ID: 1000511

Order No.:
Report #: 679599
Phone: 03 9863 8686
Fax: 03 9863 8685

Received: Sep 26, 2019 4:47 PM
Due: Oct 4, 2019
Priority: 5 Day
Contact Name: Rhian Owen

Eurofins Analytical Services Manager : Harry Bacalis

Sample Detail						HOLD	Organochlorine Pesticides	NEPM 2013 Metals : Metals M13	BTEX and Naphthalene	Moisture Set	NEPM Screen for Soil Classification	Vic EPA IWRG 621 (Solids)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794											X	
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	TP08_0.1	Sep 25, 2019		Soil	M19-Se42320		X	X		X		
2	TP20_0.1	Sep 25, 2019		Soil	M19-Se42321		X	X		X		
3	TP24_0.1	Sep 25, 2019		Soil	M19-Se42322		X	X		X	X	
4	TP25_0.1	Sep 25, 2019		Soil	M19-Se42323		X	X		X		
5	TP26_0.1	Sep 25, 2019		Soil	M19-Se42324		X	X		X		
6	TP27_0.1	Sep 25, 2019		Soil	M19-Se42325		X	X		X		
7	TP28_0.1	Sep 25, 2019		Soil	M19-Se42326		X	X		X		
8	TP29_0.1	Sep 25, 2019		Soil	M19-Se42327		X	X		X		
9	TP30_0.1	Sep 25, 2019		Soil	M19-Se42328		X	X		X		

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794											X	
Perth Laboratory - NATA Site # 23736												
10	TP31_0.1	Sep 25, 2019		Soil	M19-Se42329		X	X		X		
11	TP32_0.1	Sep 25, 2019		Soil	M19-Se42330		X	X		X		
12	TP33_0.1	Sep 25, 2019		Soil	M19-Se42331		X	X		X		
13	TP34_0.1	Sep 25, 2019		Soil	M19-Se42332		X	X		X		
14	TP35_0.1	Sep 25, 2019		Soil	M19-Se42333		X	X		X		
15	TP36_0.1	Sep 25, 2019		Soil	M19-Se42334		X	X		X		
16	TP37_0.1	Sep 25, 2019		Soil	M19-Se42335		X	X		X		
17	TP38_0.1	Sep 25, 2019		Soil	M19-Se42336		X	X		X	X	
18	TP39_0.1	Sep 25, 2019		Soil	M19-Se42337		X	X		X		
19	TP40_0.1	Sep 25, 2019		Soil	M19-Se42338		X	X		X		
20	TP41_0.1	Sep 25, 2019		Soil	M19-Se42339		X	X		X		
21	QC02	Sep 25, 2019		Soil	M19-Se42340		X	X		X		

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Sample Detail						HOLD	Organochlorine Pesticides	NEPM 2013 Metals : Metals M13	BTEX and Naphthalene	Moisture Set	NEPM Screen for Soil Classification	Vic EPA IWRG 621 (Solids)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794											X	
Perth Laboratory - NATA Site # 23736												
22	QC03	Sep 25, 2019		Soil	M19-Se42341		X	X		X		
23	TP42_0.1	Sep 25, 2019		Soil	M19-Se42342		X	X		X		
24	R02	Sep 25, 2019		Water	M19-Se42343				X			
25	FB02	Sep 25, 2019		Water	M19-Se42344				X			
26	TP10_0.1	Sep 25, 2019		Soil	M19-Se42345		X	X		X		
27	TP11_0.1	Sep 25, 2019		Soil	M19-Se42346		X	X		X		
28	CAT 1	Sep 25, 2019		Soil	M19-Se42347		X	X		X		
29	TP19_0.1	Sep 25, 2019		Soil	M19-Se42348		X	X		X		
30	DAM 1	Sep 25, 2019		Soil	M19-Se42349					X		X
31	DAM 2	Sep 25, 2019		Soil	M19-Se42350					X		X
32	DRAIN 1	Sep 25, 2019		Soil	M19-Se42351		X	X		X		
33	DRAIN 2	Sep 25, 2019		Soil	M19-Se42352		X	X		X		

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Sample Detail						HOLD	Organochlorine Pesticides	NEPM 2013 Metals : Metals M13	BTEX and Naphthalene	Moisture Set	NEPM Screen for Soil Classification	Vic EPA IWRG 621 (Solids)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794											X	
Perth Laboratory - NATA Site # 23736												
34	DRAIN 3	Sep 25, 2019		Soil	M19-Se42353		X	X		X		
35	R03	Sep 25, 2019		Water	M19-Se42354				X			
36	FB03	Sep 25, 2019		Water	M19-Se42355				X			
37	TP08_0.3	Sep 25, 2019		Soil	M19-Se42356	X						
38	TP08_0.5	Sep 25, 2019		Soil	M19-Se42357	X						
39	TP20_0.3	Sep 25, 2019		Soil	M19-Se42358	X						
40	TP20_0.5	Sep 25, 2019		Soil	M19-Se42359	X						
41	TP24_0.3	Sep 25, 2019		Soil	M19-Se42360	X						
42	TP24_0.6	Sep 25, 2019		Soil	M19-Se42361	X						
43	TP25_0.5	Sep 25, 2019		Soil	M19-Se42362	X						
44	TP26_0.2	Sep 25, 2019		Soil	M19-Se42363	X						
45	TP27_0.2	Sep 25, 2019		Soil	M19-Se42364	X						

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794											X	
Perth Laboratory - NATA Site # 23736												
46	TP28_0.3	Sep 25, 2019		Soil	M19-Se42365	X						
47	TP29_0.3	Sep 25, 2019		Soil	M19-Se42366	X						
48	TP30_0.2	Sep 25, 2019		Soil	M19-Se42367	X						
49	TP30_0.5	Sep 25, 2019		Soil	M19-Se42368	X						
50	TP31_0.3	Sep 25, 2019		Soil	M19-Se42369	X						
51	TP32_0.3	Sep 25, 2019		Soil	M19-Se42370	X						
52	TP32_0.5	Sep 25, 2019		Soil	M19-Se42371	X						
53	TP33_0.3	Sep 25, 2019		Soil	M19-Se42372	X						
54	TP34_0.3	Sep 25, 2019		Soil	M19-Se42373	X						
55	TP35_0.3	Sep 25, 2019		Soil	M19-Se42374	X						
56	TP36_0.2	Sep 25, 2019		Soil	M19-Se42375	X						
57	TP37_0.2	Sep 25, 2019		Soil	M19-Se42376	X						

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Sample Detail						HOLD	Organochlorine Pesticides	NEPM 2013 Metals : Metals M13	BTEX and Naphthalene	Moisture Set	NEPM Screen for Soil Classification	Vic EPA IWRG 621 (Solids)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794											X	
Perth Laboratory - NATA Site # 23736												
58	TP38_0.2	Sep 25, 2019		Soil	M19-Se42377	X						
59	TP39_0.2	Sep 25, 2019		Soil	M19-Se42378	X						
60	TP40_0.2	Sep 25, 2019		Soil	M19-Se42379	X						
61	TP41_0.2	Sep 25, 2019		Soil	M19-Se42380	X						
62	TP42_0.2	Sep 25, 2019		Soil	M19-Se42381	X						
Test Counts						26	30	30	4	32	2	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram | **mg/L:** milligrams per litre | **ug/L:** micrograms per litre

ppm: Parts per million | **ppb:** Parts per billion | **%:** Percentage

org/100mL: Organisms per 100 millilitres | **NTU:** Nephelometric Turbidity Units | **MPN/100mL:** Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
Volatile Organics							
1.2.4-Trichlorobenzene	mg/kg	< 0.5			0.5	Pass	
Hexachlorobutadiene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Volatile Organics							
1.1-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
1.1.1-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.1.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dibromoethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.3-Trichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.4-Trimethylbenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.3.5-Trimethylbenzene	mg/kg	< 0.5			0.5	Pass	
1.4-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
2-Butanone (MEK)	mg/kg	< 0.5			0.5	Pass	
2-Propanone (Acetone)	mg/kg	< 0.5			0.5	Pass	
4-Chlorotoluene	mg/kg	< 0.5			0.5	Pass	
4-Methyl-2-pentanone (MIBK)	mg/kg	< 0.5			0.5	Pass	
Allyl chloride	mg/kg	< 0.5			0.5	Pass	
Benzene	mg/kg	< 0.1			0.1	Pass	
Bromobenzene	mg/kg	< 0.5			0.5	Pass	
Bromochloromethane	mg/kg	< 0.5			0.5	Pass	
Bromodichloromethane	mg/kg	< 0.5			0.5	Pass	
Bromoform	mg/kg	< 0.5			0.5	Pass	
Bromomethane	mg/kg	< 0.5			0.5	Pass	
Carbon disulfide	mg/kg	< 0.5			0.5	Pass	
Carbon Tetrachloride	mg/kg	< 0.5			0.5	Pass	
Chlorobenzene	mg/kg	< 0.5			0.5	Pass	
Chloroethane	mg/kg	< 0.5			0.5	Pass	
Chloroform	mg/kg	< 0.5			0.5	Pass	
Chloromethane	mg/kg	< 0.5			0.5	Pass	
cis-1.2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
cis-1.3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	
Dibromochloromethane	mg/kg	< 0.5			0.5	Pass	
Dibromomethane	mg/kg	< 0.5			0.5	Pass	
Dichlorodifluoromethane	mg/kg	< 0.5			0.5	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
Iodomethane	mg/kg	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Isopropyl benzene (Cumene)	mg/kg	< 0.5			0.5	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
Methylene Chloride	mg/kg	< 0.5			0.5	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Styrene	mg/kg	< 0.5			0.5	Pass	
Tetrachloroethene	mg/kg	< 0.5			0.5	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
trans-1.2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
trans-1.3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	
Trichloroethene	mg/kg	< 0.5			0.5	Pass	
Trichlorofluoromethane	mg/kg	< 0.5			0.5	Pass	
Vinyl chloride	mg/kg	< 0.5			0.5	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Phenols (Halogenated)							
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 1			1	Pass	
2.4.6-Trichlorophenol	mg/kg	< 1			1	Pass	
2.6-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1	Pass	
Pentachlorophenol	mg/kg	< 1			1	Pass	
Tetrachlorophenols - Total	mg/kg	< 10			10	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	< 20			20	Pass	
2-Methyl-4.6-dinitrophenol	mg/kg	< 5			5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
2-Nitrophenol	mg/kg	< 1			1.0	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dinitrophenol	mg/kg	< 5			5	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
4-Nitrophenol	mg/kg	< 5			5	Pass	
Dinoseb	mg/kg	< 20			20	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
Method Blank							
% Clay	%	< 1			1	Pass	
Chromium (hexavalent)	mg/kg	< 1			1	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	< 10			10	Pass	
Cyanide (total)	mg/kg	< 5			5	Pass	
Fluoride (Total)	mg/kg	< 100			100	Pass	
Total Organic Carbon	%	< 0.1			0.1	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Arsenic	mg/kg	< 2			2	Pass	
Beryllium	mg/kg	< 2			2	Pass	
Boron	mg/kg	< 10			10	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Chromium	mg/kg	< 5			5	Pass	
Cobalt	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Iron	mg/kg	< 20			20	Pass	
Lead	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Manganese	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Molybdenum	mg/kg	< 5			5	Pass	
Nickel	mg/kg	< 5			5	Pass	
Nickel	mg/kg	< 5			5	Pass	
Selenium	mg/kg	< 2			2	Pass	
Selenium	mg/kg	< 2			2	Pass	
Silver	mg/kg	< 0.2			0.2	Pass	
Tin	mg/kg	< 10			10	Pass	
Zinc	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Heavy Metals							
Iron (%)	%	< 0.01			0.01	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	101			70-130	Pass	
TRH C10-C14	%	87			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethene	%	87			70-130	Pass	
1.1.1-Trichloroethane	%	103			70-130	Pass	
1.2-Dichlorobenzene	%	102			70-130	Pass	
1.2-Dichloroethane	%	106			70-130	Pass	
Benzene	%	95			70-130	Pass	
Ethylbenzene	%	97			70-130	Pass	
m&p-Xylenes	%	97			70-130	Pass	
Toluene	%	90			70-130	Pass	
Trichloroethene	%	107			70-130	Pass	
Xylenes - Total	%	98			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	100			70-130	Pass	
TRH C6-C10	%	99			70-130	Pass	
TRH >C10-C16	%	82			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	86			70-130	Pass	
Acenaphthylene	%	89			70-130	Pass	
Anthracene	%	85			70-130	Pass	
Benz(a)anthracene	%	72			70-130	Pass	
Benzo(a)pyrene	%	95			70-130	Pass	
Benzo(b&j)fluoranthene	%	92			70-130	Pass	
Benzo(g.h.i)perylene	%	93			70-130	Pass	
Benzo(k)fluoranthene	%	97			70-130	Pass	
Chrysene	%	94			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dibenz(a.h)anthracene	%	126			70-130	Pass	
Fluoranthene	%	85			70-130	Pass	
Fluorene	%	90			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	111			70-130	Pass	
Naphthalene	%	91			70-130	Pass	
Phenanthrene	%	81			70-130	Pass	
Pyrene	%	84			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	85			70-130	Pass	
4.4'-DDD	%	86			70-130	Pass	
4.4'-DDE	%	88			70-130	Pass	
4.4'-DDT	%	124			70-130	Pass	
a-BHC	%	84			70-130	Pass	
Aldrin	%	82			70-130	Pass	
b-BHC	%	74			70-130	Pass	
d-BHC	%	76			70-130	Pass	
Dieldrin	%	92			70-130	Pass	
Endosulfan I	%	80			70-130	Pass	
Endosulfan II	%	88			70-130	Pass	
Endosulfan sulphate	%	71			70-130	Pass	
Endrin	%	77			70-130	Pass	
Endrin aldehyde	%	93			70-130	Pass	
Endrin ketone	%	99			70-130	Pass	
g-BHC (Lindane)	%	91			70-130	Pass	
Heptachlor	%	76			70-130	Pass	
Heptachlor epoxide	%	94			70-130	Pass	
Hexachlorobenzene	%	82			70-130	Pass	
Methoxychlor	%	76			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	85			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	90			30-130	Pass	
2.4-Dichlorophenol	%	80			30-130	Pass	
2.4.5-Trichlorophenol	%	89			30-130	Pass	
2.4.6-Trichlorophenol	%	75			30-130	Pass	
2.6-Dichlorophenol	%	82			30-130	Pass	
4-Chloro-3-methylphenol	%	83			30-130	Pass	
Pentachlorophenol	%	77			30-130	Pass	
Tetrachlorophenols - Total	%	82			30-130	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	40			30-130	Pass	
2-Methyl-4.6-dinitrophenol	%	91			30-130	Pass	
2-Methylphenol (o-Cresol)	%	88			30-130	Pass	
2-Nitrophenol	%	85			30-130	Pass	
2.4-Dimethylphenol	%	106			30-130	Pass	
2.4-Dinitrophenol	%	43			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	88			30-130	Pass	
4-Nitrophenol	%	80			30-130	Pass	
Dinoseb	%	73			30-130	Pass	
Phenol	%	87			30-130	Pass	
LCS - % Recovery							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
% Clay	%	100			70-130	Pass	
Chromium (hexavalent)	%	96			70-130	Pass	
Cyanide (total)	%	108			70-130	Pass	
Fluoride (Total)	%	92			70-130	Pass	
Total Organic Carbon	%	102			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	110			80-120	Pass	
Arsenic	%	95			80-120	Pass	
Beryllium	%	117			80-120	Pass	
Boron	%	118			80-120	Pass	
Cadmium	%	90			80-120	Pass	
Cadmium	%	96			80-120	Pass	
Chromium	%	118			80-120	Pass	
Cobalt	%	119			80-120	Pass	
Copper	%	119			80-120	Pass	
Copper	%	102			80-120	Pass	
Iron	%	105			80-120	Pass	
Lead	%	118			80-120	Pass	
Lead	%	103			80-120	Pass	
Manganese	%	115			80-120	Pass	
Mercury	%	99			75-125	Pass	
Mercury	%	120			75-125	Pass	
Molybdenum	%	115			80-120	Pass	
Nickel	%	113			80-120	Pass	
Nickel	%	97			80-120	Pass	
Selenium	%	116			80-120	Pass	
Selenium	%	99			80-120	Pass	
Silver	%	93			80-120	Pass	
Tin	%	114			80-120	Pass	
Zinc	%	112			80-120	Pass	
Zinc	%	96			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	M19-Se42322	CP	%	84			70-130	Pass	
4.4'-DDD	M19-Se42322	CP	%	88			70-130	Pass	
4.4'-DDE	M19-Se42322	CP	%	72			70-130	Pass	
a-BHC	M19-Se42322	CP	%	76			70-130	Pass	
Aldrin	M19-Se42322	CP	%	74			70-130	Pass	
b-BHC	M19-Se42322	CP	%	80			70-130	Pass	
d-BHC	M19-Se42322	CP	%	74			70-130	Pass	
Dieldrin	M19-Se42322	CP	%	79			70-130	Pass	
Endosulfan I	M19-Se42322	CP	%	86			70-130	Pass	
Endosulfan II	M19-Se42322	CP	%	71			70-130	Pass	
Endosulfan sulphate	M19-Se42322	CP	%	79			70-130	Pass	
Endrin aldehyde	M19-Se42322	CP	%	91			70-130	Pass	
Endrin ketone	M19-Se42322	CP	%	95			70-130	Pass	
g-BHC (Lindane)	M19-Se42322	CP	%	111			70-130	Pass	
Heptachlor	M19-Se42322	CP	%	75			70-130	Pass	
Heptachlor epoxide	M19-Se42322	CP	%	89			70-130	Pass	
Hexachlorobenzene	M19-Se42322	CP	%	76			70-130	Pass	
Spike - % Recovery									
				Result 1					

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Chromium (hexavalent)	M19-Se42329	CP	%	87			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M19-Se42330	CP	%	80			75-125	Pass	
Beryllium	M19-Se42330	CP	%	102			75-125	Pass	
Boron	M19-Se42330	CP	%	99			75-125	Pass	
Cadmium	M19-Se42330	CP	%	86			75-125	Pass	
Chromium	M19-Se42330	CP	%	119			75-125	Pass	
Cobalt	M19-Se42330	CP	%	89			75-125	Pass	
Copper	M19-Se42330	CP	%	103			75-125	Pass	
Lead	M19-Se42330	CP	%	105			75-125	Pass	
Mercury	M19-Se42330	CP	%	101			70-130	Pass	
Molybdenum	M19-Se42330	CP	%	110			75-125	Pass	
Nickel	M19-Se42330	CP	%	93			75-125	Pass	
Selenium	M19-Se42330	CP	%	79			75-125	Pass	
Silver	M19-Se42330	CP	%	87			75-125	Pass	
Tin	M19-Se42330	CP	%	110			75-125	Pass	
Zinc	M19-Se42330	CP	%	104			75-125	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	M19-Se42332	CP	%	92			70-130	Pass	
4.4'-DDD	M19-Se42332	CP	%	106			70-130	Pass	
4.4'-DDE	M19-Se42332	CP	%	88			70-130	Pass	
a-BHC	M19-Se42332	CP	%	79			70-130	Pass	
Aldrin	M19-Se42332	CP	%	81			70-130	Pass	
b-BHC	M19-Se42332	CP	%	99			70-130	Pass	
d-BHC	M19-Se42332	CP	%	108			70-130	Pass	
Dieldrin	M19-Se42332	CP	%	87			70-130	Pass	
Endosulfan I	M19-Se42332	CP	%	77			70-130	Pass	
Endosulfan II	M19-Se42332	CP	%	78			70-130	Pass	
Endosulfan sulphate	M19-Se42332	CP	%	80			70-130	Pass	
Endrin	M19-Se42332	CP	%	75			70-130	Pass	
Endrin aldehyde	M19-Se42332	CP	%	76			70-130	Pass	
Endrin ketone	M19-Se42332	CP	%	78			70-130	Pass	
g-BHC (Lindane)	M19-Se42332	CP	%	92			70-130	Pass	
Heptachlor	M19-Se42332	CP	%	101			70-130	Pass	
Heptachlor epoxide	M19-Se42332	CP	%	88			70-130	Pass	
Hexachlorobenzene	M19-Se42332	CP	%	80			70-130	Pass	
Methoxychlor	M19-Se42332	CP	%	97			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M19-Se42340	CP	%	72			75-125	Fail	Q08
Beryllium	M19-Se42340	CP	%	100			75-125	Pass	
Boron	M19-Se42340	CP	%	101			75-125	Pass	
Cadmium	M19-Se42340	CP	%	83			75-125	Pass	
Chromium	M19-Se42340	CP	%	113			75-125	Pass	
Copper	M19-Se42340	CP	%	100			75-125	Pass	
Lead	M19-Se42340	CP	%	103			75-125	Pass	
Mercury	M19-Se42340	CP	%	91			70-130	Pass	
Molybdenum	M19-Se42340	CP	%	104			75-125	Pass	
Selenium	M19-Se42340	CP	%	75			75-125	Pass	
Silver	M19-Se42340	CP	%	83			75-125	Pass	
Tin	M19-Se42340	CP	%	107			75-125	Pass	
Zinc	M19-Se42340	CP	%	88			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	M19-Se42342	CP	%	104			70-130	Pass	
4.4'-DDD	M19-Se42342	CP	%	89			70-130	Pass	
4.4'-DDE	M19-Se42342	CP	%	76			70-130	Pass	
4.4'-DDT	M19-Se42342	CP	%	80			70-130	Pass	
a-BHC	M19-Se42342	CP	%	99			70-130	Pass	
Aldrin	M19-Se42342	CP	%	71			70-130	Pass	
b-BHC	M19-Se42342	CP	%	102			70-130	Pass	
d-BHC	M19-Se42342	CP	%	94			70-130	Pass	
Dieldrin	M19-Se42342	CP	%	77			70-130	Pass	
Endosulfan I	M19-Se42342	CP	%	73			70-130	Pass	
Endosulfan II	M19-Se42342	CP	%	106			70-130	Pass	
Endosulfan sulphate	M19-Se42342	CP	%	98			70-130	Pass	
Endrin	M19-Se42342	CP	%	88			70-130	Pass	
Endrin aldehyde	M19-Se42342	CP	%	73			70-130	Pass	
Endrin ketone	M19-Se42342	CP	%	98			70-130	Pass	
g-BHC (Lindane)	M19-Se42342	CP	%	84			70-130	Pass	
Heptachlor	M19-Se42342	CP	%	94			70-130	Pass	
Heptachlor epoxide	M19-Se42342	CP	%	106			70-130	Pass	
Hexachlorobenzene	M19-Se42342	CP	%	101			70-130	Pass	
Methoxychlor	M19-Se42342	CP	%	76			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M19-Oc00206	NCP	%	89			70-130	Pass	
TRH C10-C14	M19-Oc04409	NCP	%	79			70-130	Pass	
Spike - % Recovery									
Volatile Organics				Result 1					
1.1-Dichloroethene	M19-Oc02728	NCP	%	71			70-130	Pass	
1.1.1-Trichloroethane	M19-Oc02728	NCP	%	97			70-130	Pass	
1.2-Dichlorobenzene	M19-Oc02728	NCP	%	97			70-130	Pass	
1.2-Dichloroethane	M19-Oc02728	NCP	%	102			70-130	Pass	
Benzene	M19-Oc00206	NCP	%	84			70-130	Pass	
Ethylbenzene	M19-Oc00206	NCP	%	93			70-130	Pass	
m&p-Xylenes	M19-Oc00206	NCP	%	96			70-130	Pass	
o-Xylene	M19-Oc00206	NCP	%	97			70-130	Pass	
Toluene	M19-Oc00206	NCP	%	85			70-130	Pass	
Trichloroethene	M19-Oc02728	NCP	%	102			70-130	Pass	
Xylenes - Total	M19-Oc00206	NCP	%	97			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M19-Oc00206	NCP	%	98			70-130	Pass	
TRH C6-C10	M19-Oc00206	NCP	%	88			70-130	Pass	
TRH >C10-C16	M19-Oc04409	NCP	%	76			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1016	M19-Oc02474	NCP	%	88			70-130	Pass	
Aroclor-1260	M19-Oc02474	NCP	%	90			70-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2.4-Dinitrophenol	M19-Oc03174	NCP	%	31			30-130	Pass	
Spike - % Recovery									
				Result 1					
Cyanide (total)	M19-Oc05600	NCP	%	119			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Fluoride (Total)	M19-Se40952	NCP	%	79			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M19-Se42350	CP	%	76			70-130	Pass	
Acenaphthylene	M19-Se42350	CP	%	79			70-130	Pass	
Anthracene	M19-Se42350	CP	%	73			70-130	Pass	
Benz(a)anthracene	M19-Se42350	CP	%	79			70-130	Pass	
Benzo(a)pyrene	M19-Se42350	CP	%	82			70-130	Pass	
Benzo(b&j)fluoranthene	M19-Se42350	CP	%	75			70-130	Pass	
Benzo(g.h.i)perylene	M19-Se42350	CP	%	92			70-130	Pass	
Benzo(k)fluoranthene	M19-Se42350	CP	%	83			70-130	Pass	
Chrysene	M19-Se42350	CP	%	78			70-130	Pass	
Dibenz(a.h)anthracene	M19-Se42350	CP	%	110			70-130	Pass	
Fluoranthene	M19-Se42350	CP	%	74			70-130	Pass	
Fluorene	M19-Se42350	CP	%	78			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M19-Se42350	CP	%	82			70-130	Pass	
Naphthalene	M19-Se42350	CP	%	78			70-130	Pass	
Phenanthrene	M19-Se42350	CP	%	78			70-130	Pass	
Pyrene	M19-Se42350	CP	%	74			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	M19-Se42350	CP	%	76			30-130	Pass	
2.4-Dichlorophenol	M19-Se42350	CP	%	66			30-130	Pass	
2.4.5-Trichlorophenol	M19-Se42350	CP	%	78			30-130	Pass	
2.4.6-Trichlorophenol	M19-Se42350	CP	%	56			30-130	Pass	
2.6-Dichlorophenol	M19-Se42350	CP	%	62			30-130	Pass	
4-Chloro-3-methylphenol	M19-Se42350	CP	%	71			30-130	Pass	
Pentachlorophenol	M19-Se42350	CP	%	53			30-130	Pass	
Tetrachlorophenols - Total	M19-Se42350	CP	%	66			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Cyclohexyl-4.6-dinitrophenol	M19-Se42350	CP	%	51			30-130	Pass	
2-Methyl-4.6-dinitrophenol	M19-Se42350	CP	%	47			30-130	Pass	
2-Methylphenol (o-Cresol)	M19-Se42350	CP	%	66			30-130	Pass	
2-Nitrophenol	M19-Se42350	CP	%	74			30-130	Pass	
2.4-Dimethylphenol	M19-Se42350	CP	%	48			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	M19-Se42350	CP	%	70			30-130	Pass	
4-Nitrophenol	M19-Se42350	CP	%	49			30-130	Pass	
Dinoseb	M19-Se42350	CP	%	69			30-130	Pass	
Phenol	M19-Se42350	CP	%	74			30-130	Pass	
Spike - % Recovery									
				Result 1					
Chromium (hexavalent)	M19-Se42351	CP	%	94			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M19-Se42352	CP	%	90			75-125	Pass	
Beryllium	M19-Se42352	CP	%	101			75-125	Pass	
Boron	M19-Se42352	CP	%	93			75-125	Pass	
Cadmium	M19-Se42352	CP	%	85			75-125	Pass	
Chromium	M19-Se42352	CP	%	117			75-125	Pass	
Cobalt	M19-Se42352	CP	%	106			75-125	Pass	
Copper	M19-Se42352	CP	%	107			75-125	Pass	
Lead	M19-Se42352	CP	%	113			75-125	Pass	
Manganese	M19-Se42352	CP	%	102			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Mercury	M19-Se42352	CP	%	98			70-130	Pass	
Molybdenum	M19-Se42352	CP	%	109			75-125	Pass	
Nickel	M19-Se42352	CP	%	110			75-125	Pass	
Selenium	M19-Se42352	CP	%	94			75-125	Pass	
Silver	M19-Se42352	CP	%	85			75-125	Pass	
Tin	M19-Se42352	CP	%	106			75-125	Pass	
Zinc	M19-Se42352	CP	%	112			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M19-Se42321	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M19-Se42321	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M19-Se42321	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M19-Se42321	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	M19-Se42321	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M19-Se42321	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	M19-Se42321	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M19-Se42321	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M19-Se42321	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	M19-Se42321	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M19-Se42321	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	M19-Se42321	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M19-Se42321	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M19-Se42321	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M19-Se42321	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M19-Se42321	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M19-Se42321	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	M19-Se42321	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	M19-Se42321	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	M19-Se42321	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	M19-Se42321	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	M19-Se42321	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	M19-Se42321	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	M19-Se42321	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	M19-Se42321	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	M19-Se42321	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	M19-Se42321	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	M19-Se42321	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	M19-Se42321	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	M19-Se42321	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	M19-Se42321	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	M19-Se42321	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	M19-Se42321	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	M19-Se42321	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	M19-Se42321	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	M19-Se42321	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	M19-Se42321	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	M19-Se42321	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	M19-Se42321	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	M19-Se42321	CP	mg/kg	< 1	< 1	<1	30%	Pass	

Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2.6-Dichlorophenol	M19-Se42321	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	M19-Se42321	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	M19-Se42321	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	M19-Se42321	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	M19-Se42321	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	M19-Se42321	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	M19-Se42321	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	M19-Se42321	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	M19-Se42321	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	M19-Se42321	CP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	M19-Se42321	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	M19-Se42321	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	M19-Se42321	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	M19-Se42321	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Clay	S19-Jl06129	NCP	%	3.8	3.8	<1	30%	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	M19-Oc04304	NCP	uS/cm	710	690	4.0	30%	Pass	
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	M19-Se42273	NCP	pH Units	6.1	6.1	pass	30%	Pass	
% Moisture	M19-Se42322	CP	%	30	30	3.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chromium (hexavalent)	M19-Se42328	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M19-Se42329	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Beryllium	M19-Se42329	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Boron	M19-Se42329	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Cadmium	M19-Se42329	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M19-Se42329	CP	mg/kg	110	120	10	30%	Pass	
Cobalt	M19-Se42329	CP	mg/kg	46	40	13	30%	Pass	
Copper	M19-Se42329	CP	mg/kg	55	61	11	30%	Pass	
Iron	M19-Se42329	CP	mg/kg	58000	64000	10	30%	Pass	
Lead	M19-Se42329	CP	mg/kg	15	13	17	30%	Pass	
Manganese	M19-Se42329	CP	mg/kg	1400	1100	18	30%	Pass	
Mercury	M19-Se42329	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Molybdenum	M19-Se42329	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	M19-Se42329	CP	mg/kg	99	110	11	30%	Pass	
Selenium	M19-Se42329	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Silver	M19-Se42329	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tin	M19-Se42329	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Zinc	M19-Se42329	CP	mg/kg	59	61	3.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M19-Se42330	CP	mg/kg	2.0	< 2	1.0	30%	Pass	
Beryllium	M19-Se42330	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Boron	M19-Se42330	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Cadmium	M19-Se42330	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M19-Se42330	CP	mg/kg	130	130	<1	30%	Pass	
Cobalt	M19-Se42330	CP	mg/kg	67	69	2.0	30%	Pass	
Copper	M19-Se42330	CP	mg/kg	73	74	1.0	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Lead	M19-Se42330	CP	mg/kg	15	16	2.0	30%	Pass	
Manganese	M19-Se42330	CP	mg/kg	2300	2300	1.0	30%	Pass	
Mercury	M19-Se42330	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Molybdenum	M19-Se42330	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	M19-Se42330	CP	mg/kg	120	120	1.0	30%	Pass	
Selenium	M19-Se42330	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Silver	M19-Se42330	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tin	M19-Se42330	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Zinc	M19-Se42330	CP	mg/kg	71	72	2.0	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M19-Se42331	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M19-Se42331	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M19-Se42331	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M19-Se42331	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	M19-Se42331	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M19-Se42331	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	M19-Se42331	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M19-Se42331	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M19-Se42331	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	M19-Se42331	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M19-Se42331	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	M19-Se42331	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M19-Se42331	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M19-Se42331	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M19-Se42331	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M19-Se42331	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M19-Se42331	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	M19-Se42331	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	M19-Se42331	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	M19-Se42331	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	M19-Se42331	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	M19-Se42331	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	M19-Se42331	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	M19-Se42331	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	M19-Se42331	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	M19-Se42331	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	M19-Se42331	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	M19-Se42331	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	M19-Se42331	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	M19-Se42331	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	M19-Se42331	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	M19-Se42331	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	M19-Se42331	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	M19-Se42331	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	M19-Se42331	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	M19-Se42331	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	M19-Se42331	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	M19-Se42331	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	M19-Se42331	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	M19-Se42331	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	M19-Se42331	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	M19-Se42331	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	M19-Se42331	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	M19-Se42331	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	M19-Se42331	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	M19-Se42331	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	M19-Se42331	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	M19-Se42331	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	M19-Se42331	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	M19-Se42331	CP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	M19-Se42331	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	M19-Se42331	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	M19-Se42331	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	M19-Se42331	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M19-Se42332	CP	%	32	32	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chromium (hexavalent)	M19-Se42338	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M19-Se42339	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Beryllium	M19-Se42339	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Boron	M19-Se42339	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Cadmium	M19-Se42339	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M19-Se42339	CP	mg/kg	230	270	14	30%	Pass	
Cobalt	M19-Se42339	CP	mg/kg	11	11	<1	30%	Pass	
Copper	M19-Se42339	CP	mg/kg	52	56	7.0	30%	Pass	
Lead	M19-Se42339	CP	mg/kg	17	16	6.0	30%	Pass	
Manganese	M19-Se42339	CP	mg/kg	710	700	1.0	30%	Pass	
Mercury	M19-Se42339	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Molybdenum	M19-Se42339	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	M19-Se42339	CP	mg/kg	59	61	3.0	30%	Pass	
Selenium	M19-Se42339	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Silver	M19-Se42339	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tin	M19-Se42339	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Zinc	M19-Se42339	CP	mg/kg	48	47	3.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M19-Se42340	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Beryllium	M19-Se42340	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Boron	M19-Se42340	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Cadmium	M19-Se42340	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M19-Se42340	CP	mg/kg	110	110	1.0	30%	Pass	
Cobalt	M19-Se42340	CP	mg/kg	460	470	1.0	30%	Pass	
Copper	M19-Se42340	CP	mg/kg	43	44	1.0	30%	Pass	
Iron	M19-Se42340	CP	mg/kg	74000	75000	2.0	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Lead	M19-Se42340	CP	mg/kg	19	19	2.0	30%	Pass	
Manganese	M19-Se42340	CP	mg/kg	9500	9500	<1	30%	Pass	
Mercury	M19-Se42340	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Molybdenum	M19-Se42340	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	M19-Se42340	CP	mg/kg	170	170	1.0	30%	Pass	
Selenium	M19-Se42340	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Silver	M19-Se42340	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tin	M19-Se42340	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Zinc	M19-Se42340	CP	mg/kg	46	48	2.0	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M19-Se42341	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M19-Se42341	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M19-Se42341	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M19-Se42341	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	M19-Se42341	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M19-Se42341	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	M19-Se42341	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M19-Se42341	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M19-Se42341	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	M19-Se42341	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M19-Se42341	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	M19-Se42341	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M19-Se42341	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M19-Se42341	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M19-Se42341	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M19-Se42341	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M19-Se42341	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	M19-Se42341	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	M19-Se42341	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	M19-Se42341	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	M19-Se42341	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	M19-Se42341	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	M19-Se42341	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	M19-Se42341	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	M19-Se42341	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	M19-Se42341	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	M19-Se42341	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	M19-Se42341	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	M19-Se42341	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	M19-Se42341	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	M19-Se42341	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	M19-Se42341	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	M19-Se42341	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	M19-Se42341	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	M19-Se42341	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	M19-Se42341	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	M19-Se43279	NCP	mg/kg	< 1	< 1	<1	30%	Pass	

Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	M19-Se42341	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	M19-Se42341	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	M19-Se42341	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	M19-Se42341	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	M19-Se42341	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	M19-Se42341	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	M19-Se42341	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	M19-Se42341	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	M19-Se42341	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	M19-Se42341	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	M19-Se42341	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	M19-Se42341	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	M19-Se42341	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	M19-Se42341	CP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	M19-Se42341	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	M19-Se42341	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	M19-Se42341	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	M19-Se42341	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M19-Se42342	CP	%	35	30	16	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M19-Oc00354	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S19-Se41640	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S19-Se41640	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S19-Se41640	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.2.4-Trichlorobenzene	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Hexachlorobutadiene	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.1-Dichloroethane	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1-Dichloroethene	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1-Trichloroethane	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2-Trichloroethane	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2.2-Tetrachloroethane	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dibromoethane	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichlorobenzene	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloroethane	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloropropane	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.3-Trichloropropane	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.4-Trimethylbenzene	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichlorobenzene	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichloropropane	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3.5-Trimethylbenzene	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.4-Dichlorobenzene	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Butanone (MEK)	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Propanone (Acetone)	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chlorotoluene	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
4-Methyl-2-pentanone (MIBK)	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Allyl chloride	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzene	M19-Oc00354	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Bromobenzene	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromochloromethane	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromodichloromethane	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromoform	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromomethane	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon disulfide	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon Tetrachloride	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chlorobenzene	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroethane	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroform	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloromethane	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.2-Dichloroethene	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.3-Dichloropropene	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibromochloromethane	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibromomethane	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dichlorodifluoromethane	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Ethylbenzene	M19-Oc00354	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Iodomethane	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Isopropyl benzene (Cumene)	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
m&p-Xylenes	M19-Oc00354	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methylene Chloride	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
o-Xylene	M19-Oc00354	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Styrene	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Tetrachloroethene	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Toluene	M19-Oc00354	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
trans-1.2-Dichloroethene	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
trans-1.3-Dichloropropene	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Trichloroethene	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Trichlorofluoromethane	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Vinyl chloride	M19-Se40445	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Xylenes - Total	M19-Oc00354	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M19-Oc00354	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M19-Oc00354	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S19-Se41640	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S19-Se41640	NCP	mg/kg	< 100		<1	30%	Pass	
TRH >C34-C40	S19-Se41640	NCP	mg/kg	< 100		<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M19-Se42349	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M19-Se42349	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M19-Se42349	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M19-Se42349	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	M19-Se42349	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M19-Se42349	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	M19-Se42349	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M19-Se42349	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M19-Se42349	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	M19-Se42349	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M19-Se42349	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Fluorene	M19-Se42349	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M19-Se42349	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M19-Se42349	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M19-Se42349	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M19-Se42349	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M19-Se42349	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	M19-Se42349	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	M19-Se42349	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	M19-Se42349	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	M19-Se42349	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	M19-Se42349	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	M19-Se42349	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	M19-Se42349	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	M19-Se42349	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	M19-Se42349	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	M19-Se42349	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	M19-Se42349	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	M19-Se42349	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	M19-Se42349	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	M19-Se42349	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	M19-Se42349	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	M19-Se42349	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	M19-Se42349	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	M19-Se42349	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	M19-Se42349	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	M19-Se42349	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	M19-Se42349	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	M19-Se42349	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	M19-Se42349	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	M19-Se42349	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	M19-Se42349	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	M19-Se42349	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	M19-Se42349	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	M19-Se42349	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	M19-Se42349	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	M19-Se42349	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	M19-Se42349	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	M19-Se42349	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	M19-Se42349	CP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	M19-Se42349	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	M19-Se42349	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	M19-Se42349	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	M19-Se42349	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Cyanide (total)	M19-Oc05599	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Fluoride (Total)	B19-Se41700	NCP	mg/kg	220	180	20	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	M19-Se40952	NCP	pH Units	8.2	8.3	pass	30%	Pass	

Duplicate									
				Result 1	Result 2	RPD			
Chromium (hexavalent)	M19-Se42350	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M19-Se42352	CP	mg/kg	2.6	2.5	2.0	30%	Pass	
Beryllium	M19-Se42352	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Boron	M19-Se42352	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Cadmium	M19-Se42352	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M19-Se42352	CP	mg/kg	60	61	2.0	30%	Pass	
Cobalt	M19-Se42352	CP	mg/kg	23	23	2.0	30%	Pass	
Copper	M19-Se42352	CP	mg/kg	33	34	1.0	30%	Pass	
Iron	M19-Se42352	CP	mg/kg	38000	37000	<1	30%	Pass	
Lead	M19-Se42352	CP	mg/kg	75	76	<1	30%	Pass	
Manganese	M19-Se42352	CP	mg/kg	420	430	1.0	30%	Pass	
Mercury	M19-Se42352	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Molybdenum	M19-Se42352	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	M19-Se42352	CP	mg/kg	40	41	1.0	30%	Pass	
Selenium	M19-Se42352	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Silver	M19-Se42352	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tin	M19-Se42352	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Zinc	M19-Se42352	CP	mg/kg	100	100	1.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.

Authorised By

Harry Bacalis	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Jonathon Angell	Senior Analyst-Inorganic (QLD)
Joseph Edouard	Senior Analyst-Organic (VIC)
Julie Kay	Senior Analyst-Inorganic (VIC)

Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Tonkin & Taylor P/L
Level 3, 99 Coventry St
Southbank
VIC 3006

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Rhian Owen**

Report **679599-W**
Project name
Project ID 1000511
Received Date Sep 26, 2019

Client Sample ID			**R02**	**FB02**	**R03**	**FB03**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**M19-Se42343**	**M19-Se42344**	**M19-Se42354**	**M19-Se42355**
Date Sampled			**Sep 25, 2019**	**Sep 25, 2019**	**Sep 25, 2019**	**Sep 25, 2019**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	121	127	114	123

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
BTEX and Naphthalene			
BTEX	Melbourne	Oct 01, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			

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NATA # 1261
Site # 23736

Company Name: Tonkin & Taylor P/L
Address: Level 3, 99 Coventry St
Southbank
VIC 3006

Project Name:
Project ID: 1000511

Order No.:
Report #: 679599
Phone: 03 9863 8686
Fax: 03 9863 8685

Received: Sep 26, 2019 4:47 PM
Due: Oct 4, 2019
Priority: 5 Day
Contact Name: Rhian Owen

Eurofins Analytical Services Manager : Harry Bacalis

Sample Detail						HOLD	Organochlorine Pesticides	NEPM 2013 Metals : Metals M13	BTEX and Naphthalene	Moisture Set	NEPM Screen for Soil Classification	Vic EPA IWRG 621 (Solids)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794											X	
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	TP08_0.1	Sep 25, 2019		Soil	M19-Se42320		X	X		X		
2	TP20_0.1	Sep 25, 2019		Soil	M19-Se42321		X	X		X		
3	TP24_0.1	Sep 25, 2019		Soil	M19-Se42322		X	X		X	X	
4	TP25_0.1	Sep 25, 2019		Soil	M19-Se42323		X	X		X		
5	TP26_0.1	Sep 25, 2019		Soil	M19-Se42324		X	X		X		
6	TP27_0.1	Sep 25, 2019		Soil	M19-Se42325		X	X		X		
7	TP28_0.1	Sep 25, 2019		Soil	M19-Se42326		X	X		X		
8	TP29_0.1	Sep 25, 2019		Soil	M19-Se42327		X	X		X		
9	TP30_0.1	Sep 25, 2019		Soil	M19-Se42328		X	X		X		

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794											X	
Perth Laboratory - NATA Site # 23736												
10	TP31_0.1	Sep 25, 2019		Soil	M19-Se42329		X	X		X		
11	TP32_0.1	Sep 25, 2019		Soil	M19-Se42330		X	X		X		
12	TP33_0.1	Sep 25, 2019		Soil	M19-Se42331		X	X		X		
13	TP34_0.1	Sep 25, 2019		Soil	M19-Se42332		X	X		X		
14	TP35_0.1	Sep 25, 2019		Soil	M19-Se42333		X	X		X		
15	TP36_0.1	Sep 25, 2019		Soil	M19-Se42334		X	X		X		
16	TP37_0.1	Sep 25, 2019		Soil	M19-Se42335		X	X		X		
17	TP38_0.1	Sep 25, 2019		Soil	M19-Se42336		X	X		X	X	
18	TP39_0.1	Sep 25, 2019		Soil	M19-Se42337		X	X		X		
19	TP40_0.1	Sep 25, 2019		Soil	M19-Se42338		X	X		X		
20	TP41_0.1	Sep 25, 2019		Soil	M19-Se42339		X	X		X		
21	QC02	Sep 25, 2019		Soil	M19-Se42340		X	X		X		

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Sample Detail						HOLD	Organochlorine Pesticides	NEPM 2013 Metals : Metals M13	BTEX and Naphthalene	Moisture Set	NEPM Screen for Soil Classification	Vic EPA IWRG 621 (Solids)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794											X	
Perth Laboratory - NATA Site # 23736												
22	QC03	Sep 25, 2019		Soil	M19-Se42341		X	X		X		
23	TP42_0.1	Sep 25, 2019		Soil	M19-Se42342		X	X		X		
24	R02	Sep 25, 2019		Water	M19-Se42343				X			
25	FB02	Sep 25, 2019		Water	M19-Se42344				X			
26	TP10_0.1	Sep 25, 2019		Soil	M19-Se42345		X	X		X		
27	TP11_0.1	Sep 25, 2019		Soil	M19-Se42346		X	X		X		
28	CAT 1	Sep 25, 2019		Soil	M19-Se42347		X	X		X		
29	TP19_0.1	Sep 25, 2019		Soil	M19-Se42348		X	X		X		
30	DAM 1	Sep 25, 2019		Soil	M19-Se42349					X		X
31	DAM 2	Sep 25, 2019		Soil	M19-Se42350					X		X
32	DRAIN 1	Sep 25, 2019		Soil	M19-Se42351		X	X		X		
33	DRAIN 2	Sep 25, 2019		Soil	M19-Se42352		X	X		X		

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Sample Detail						HOLD	Organochlorine Pesticides	NEPM 2013 Metals : Metals M13	BTEX and Naphthalene	Moisture Set	NEPM Screen for Soil Classification	Vic EPA IWRG 621 (Solids)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794											X	
Perth Laboratory - NATA Site # 23736												
34	DRAIN 3	Sep 25, 2019		Soil	M19-Se42353		X	X		X		
35	R03	Sep 25, 2019		Water	M19-Se42354				X			
36	FB03	Sep 25, 2019		Water	M19-Se42355				X			
37	TP08_0.3	Sep 25, 2019		Soil	M19-Se42356	X						
38	TP08_0.5	Sep 25, 2019		Soil	M19-Se42357	X						
39	TP20_0.3	Sep 25, 2019		Soil	M19-Se42358	X						
40	TP20_0.5	Sep 25, 2019		Soil	M19-Se42359	X						
41	TP24_0.3	Sep 25, 2019		Soil	M19-Se42360	X						
42	TP24_0.6	Sep 25, 2019		Soil	M19-Se42361	X						
43	TP25_0.5	Sep 25, 2019		Soil	M19-Se42362	X						
44	TP26_0.2	Sep 25, 2019		Soil	M19-Se42363	X						
45	TP27_0.2	Sep 25, 2019		Soil	M19-Se42364	X						

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NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: Tonkin & Taylor P/L
Address: Level 3, 99 Coventry St
Southbank
VIC 3006

Project Name:
Project ID: 1000511

Order No.:
Report #: 679599
Phone: 03 9863 8686
Fax: 03 9863 8685

Received: Sep 26, 2019 4:47 PM
Due: Oct 4, 2019
Priority: 5 Day
Contact Name: Rhian Owen

Eurofins Analytical Services Manager : Harry Bacalis

Sample Detail						HOLD	Organochlorine Pesticides	NEPM 2013 Metals : Metals M13	BTEX and Naphthalene	Moisture Set	NEPM Screen for Soil Classification	Vic EPA IWRG 621 (Solids)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794											X	
Perth Laboratory - NATA Site # 23736												
46	TP28_0.3	Sep 25, 2019		Soil	M19-Se42365	X						
47	TP29_0.3	Sep 25, 2019		Soil	M19-Se42366	X						
48	TP30_0.2	Sep 25, 2019		Soil	M19-Se42367	X						
49	TP30_0.5	Sep 25, 2019		Soil	M19-Se42368	X						
50	TP31_0.3	Sep 25, 2019		Soil	M19-Se42369	X						
51	TP32_0.3	Sep 25, 2019		Soil	M19-Se42370	X						
52	TP32_0.5	Sep 25, 2019		Soil	M19-Se42371	X						
53	TP33_0.3	Sep 25, 2019		Soil	M19-Se42372	X						
54	TP34_0.3	Sep 25, 2019		Soil	M19-Se42373	X						
55	TP35_0.3	Sep 25, 2019		Soil	M19-Se42374	X						
56	TP36_0.2	Sep 25, 2019		Soil	M19-Se42375	X						
57	TP37_0.2	Sep 25, 2019		Soil	M19-Se42376	X						

eurofins | Environment Testing

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794											X	
Perth Laboratory - NATA Site # 23736												
58	TP38_0.2	Sep 25, 2019		Soil	M19-Se42377	X						
59	TP39_0.2	Sep 25, 2019		Soil	M19-Se42378	X						
60	TP40_0.2	Sep 25, 2019		Soil	M19-Se42379	X						
61	TP41_0.2	Sep 25, 2019		Soil	M19-Se42380	X						
62	TP42_0.2	Sep 25, 2019		Soil	M19-Se42381	X						
Test Counts						26	30	30	4	32	2	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram | **mg/L:** milligrams per litre | **ug/L:** micrograms per litre

ppm: Parts per million | **ppb:** Parts per billion | **%:** Percentage

org/100mL: Organisms per 100 millilitres | **NTU:** Nephelometric Turbidity Units | **MPN/100mL:** Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	108			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	113			70-130	Pass	
Toluene	%	112			70-130	Pass	
Ethylbenzene	%	123			70-130	Pass	
m&p-Xylenes	%	122			70-130	Pass	
Xylenes - Total	%	121			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	N19-Oc00170	NCP	%	102			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	N19-Oc00170	NCP	%	102			70-130	Pass	
Toluene	N19-Oc00170	NCP	%	101			70-130	Pass	
Ethylbenzene	N19-Oc00170	NCP	%	109			70-130	Pass	
m&p-Xylenes	N19-Oc00170	NCP	%	109			70-130	Pass	
o-Xylene	N19-Oc00170	NCP	%	107			70-130	Pass	
Xylenes - Total	N19-Oc00170	NCP	%	108			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M19-Oc03540	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M19-Oc03540	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	M19-Oc03540	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M19-Oc03540	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M19-Oc03540	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	M19-Oc03540	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	M19-Oc03540	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.

Authorised By

Harry Bacalis	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)

Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Tonkin+Taylor

Chain of Custody (COC)

Laboratory:

Address:

Analysis Required

Project Name:

Project Manager:

Sampler Name:

Job Number:

Comments/Instructions:

Container Type & Preservation Codes:

CHILLED, TICK IF YES

Sample ID	Sample Date	Time	Sample Matrix (e.g. soil, water etc)	Container/Preservative Type (e.g. glass, vial etc)
[illegible]	[illegible]			

Environmental Division
Melbourne
EM1917234

Results Required Within:

Total:

Relinquished by:	Received by:	Relinquished by:	Received by:
Signature	Signature	Signature	Signature
Company	Company	Company	Company

Tonkin+Taylor

Chain of Custody (COC)

Enviro Sample Vic

From: Harry Bacais
Sent: Tuesday, 1 October 2019 10:1[illegible] AM
To: Finn Otley
Cc: Rhian Owen; Enviro Sample Vic; Catherine Wilson
Subject: RE: Forward samples 100511

No worries Finn

[illegible]

Good to hear Finn

Kind regards

Harry Bacais
Phone: +61 3 [illegible]
Mobile: +61 [illegible]
Email: [illegible]

From: Finn Otley [illegible]
Sent: Tuesday, 1 October 2019 9:53 AM
To: Harry Bacais
Cc: Rhian Owen
Subject: Forward samples 100511

EXTERNAL EMAIL

Hi Harry,

Once you have completed the analysis for samples QC01, QC02 and QC03 from job reference 100511, could you please forward them to ALS for additional analysis of the same analytes outlined on our COC.

Any issues please contact me.

PS. The summa canisters arrived for the job 5251

Thanks,

Finn Otley | Environmental Engineer
BEng(EnvEng)(Hons)
Tonkin + Taylor - *Exceptional thinking together*
Kings Technology Park, Level 1, 99 Coventry Street, Southbank, Vic 3006 | PO Box 5305, South Melbourne, Vic 3205, Australia
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Tonkin+Taylor

To send me large files you can use my file drop

Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM1917234**	Page	: 1 of 4
Client	: **TONKIN AND TAYLOR PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: MR RHIAN OWEN	Telephone	: +6138549 9652
Project	: 1000511	Date Samples Received	: 15-Oct-2019
Site	: ----	Issue Date	: 21-Oct-2019
Sampler	: FOT	No. of samples received	: 2
Order number	: ----	No. of samples analysed	: 2

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

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This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

□ □□□□ □ □□ □□ □□□□ □□ □□□□ □□□ □ □□ □ □□□□□

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

□ □□□□ □ □□ □□□□□□□ □□□ □□ □□□ □□□□ □□□ □ □□

- **NO Quality Control Sample Frequency Outliers exist.**

Matrix: **SOIL**

	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)	Date extracted	Due for extraction		Date analysed	Due for analysis	
EA055: Moisture Content (Dried @ 105-110°C)						
Soil Glass Jar - Unpreserved						
QC02, QC03	----	----	----	16-Oct-2019	09-Oct-2019	**7**
EP068A: Organochlorine Pesticides (OC)						
Soil Glass Jar - Unpreserved						
QC02, QC03	16-Oct-2019	09-Oct-2019	**7**	----	----	----

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days □ other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for □□ □□ □□□□ vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days□ others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: □ = Holding time breach □□ = Within holding time.

		Extraction / Preparation			Analysis		
Client Sample ID(s)			Due for extraction	Evaluation		Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055)							
QC02, QC03	**25-Sep-2019**	**----**	----	----	**16-Oct-2019**	09-Oct-2019	□
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
QC02, QC03	**25-Sep-2019**	**18-Oct-2019**	23-Mar-2020	□	**18-Oct-2019**	23-Mar-2020	□
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
QC02, QC03	**25-Sep-2019**	**18-Oct-2019**	23-Oct-2019	□	**18-Oct-2019**	23-Oct-2019	□
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068)							
QC02, QC03	**25-Sep-2019**	**16-Oct-2019**	09-Oct-2019	□	**17-Oct-2019**	25-Nov-2019	□

Qua ity ont o Pa amete F equency omp iance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: û = Quality Control frequency not within specification ; ü = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	□□□□	Expec □d	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	14	**14.29**	**10.00**	Π	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	2	**50.00**	**10.00**	Π	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	16	**12.50**	**10.00**	Π	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	**10.00**	**10.00**	Π	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Pesticides by GCMS	EP068	1	2	**50.00**	**5.00**	Π	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	16	**6.25**	**5.00**	Π	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	Π	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Pesticides by GCMS	EP068	1	2	**50.00**	**5.00**	Π	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	16	**6.25**	**5.00**	Π	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	Π	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Pesticides by GCMS	EP068	1	2	**50.00**	**5.00**	Π	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	16	**6.25**	**5.00**	Π	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	Π	NEPM 2013 B3 & ALS QC Standard

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120 USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 504,505)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1917234**	Page	: 1 of 5
Client	: **TONKIN AND TAYLOR PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: MR RHIAN OWEN	Contact	: Kane Vorwerk
Address	: GROUND FLOOR 95 COVENTRY STREET SOUTHBANK VIC 3006	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: +61 03 9863 8686	Telephone	: +6138549 9652
Project	: 1000511	Date Samples Received	: 15-Oct-2019 08:45
Order number	: ----	Date Analysis Commenced	: 16-Oct-2019
C-O-C number	: 2356, 2358	Issue Date	: 21-Oct-2019 16:39
Sampler	: FOT		
Site	: ----		
Quote number	: EN/333 Secondary Work		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC

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The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
□ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QC02	QC03	----	----	----
			Client sampling date / time	25-Sep-2019 00:00	25-Sep-2019 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EM1917234-001	EM1917234-002	--------	--------	--------
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**31.0**	**32.7**	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Barium	7440-39-3	10	mg/kg	**220**	**160**	----	----	----
Beryllium	7440-41-7	1	mg/kg	**1**	<1	----	----	----
Cobalt	7440-48-4	2	mg/kg	**43**	**8**	----	----	----
Manganese	7439-96-5	5	mg/kg	**1830**	**749**	----	----	----
Vanadium	7440-62-2	5	mg/kg	**158**	**189**	----	----	----
Arsenic	7440-38-2	5	mg/kg	<5	<5	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	**85**	**216**	----	----	----
Copper	7440-50-8	5	mg/kg	**37**	**52**	----	----	----
Lead	7439-92-1	5	mg/kg	**16**	**15**	----	----	----
Nickel	7440-02-0	2	mg/kg	**58**	**48**	----	----	----
Zinc	7440-66-6	5	mg/kg	**30**	**38**	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	----	----	----
4.4-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	----	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	----	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	----	----	----

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QC02	QC03	----	----	----
			Client sampling date / time	25-Sep-2019 00:00	25-Sep-2019 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EM1917234-001	EM1917234-002	--------	--------	--------
				Result	Result	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued								
4.4-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	----	----	----
4.4-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	<0.05	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	**81.2**	**84.4**	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	**82.4**	**88.6**	----	----	----

Sub-Matrix: **SOIL**

Compound	CAS Number		
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	38	128
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	33	139

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EM1917234**	Page	: 1 of 5
Client	: **TONKIN AND TAYLOR PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: MR RHIAN OWEN	Contact	: Kane Vorwerk
Address	: GROUND FLOOR 95 COVENTRY STREET SOUTHBANK VIC 3006	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: +61 03 9863 8686	Telephone	: +6138549 9652
Project	: 1000511	Date Samples Received	: 15-Oct-2019
Order number	: ----	Date Analysis Commenced	: 16-Oct-2019
C-O-C number	: 2356, 2358	Issue Date	: 21-Oct-2019
Sampler	: FOT		
Site	: ----		
Quote number	: EN/333 Secondary Work		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report Recovery and Acceptance Limits
- Matrix Spike (MS) Report Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
□ = Indicates failed QC

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit□Result between 10 and 20 times LOR: 0% - 50%□Result □20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 2649900)									
EM1917201-008	Anonymous	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	23	20	12.4	0% - 50%
		EG005T: Cobalt	7440-48-4	2	mg/kg	14	10	32.9	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	12	10	17.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	40	40	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	528	501	5.34	0% - 20%
		EG005T: Vanadium	7440-62-2	5	mg/kg	92	93	0.00	0% - 50%
		EG005T: □inc	7440-66-6	5	mg/kg	22	18	18.1	No Limit
EM1917222-001	Anonymous	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	80	70	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	10	9	0.00	No Limit
		EG005T: Cobalt	7440-48-4	2	mg/kg	3	3	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	6	5	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	7	7	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	12	12	0.00	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	96	88	8.70	0% - 50%
		EG005T: Vanadium	7440-62-2	5	mg/kg	30	28	4.00	No Limit
		EG005T: □inc	7440-66-6	5	mg/kg	23	20	13.8	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2644142)									
EM1917102-001	Anonymous	EA055: Moisture Content	----	0.1	%	18.7	19.2	2.65	0% - 50%

Sub-Matrix: **SOIL**

EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2644142) - continued									
EM1917102-011	Anonymous	EA055: Moisture Content	----	0.1	%	18.2	19.0	4.70	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2649901)									
EM1917201-008	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EM1917222-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 2644417)									
EM1917234-001	QC02	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4□DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4□DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4□DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2649900)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	95.8	78.5	107
EG005T: Barium	7440-39-3	10	mg/kg	<10	143 mg/kg	99.8	76.4	110
EG005T: Beryllium	7440-41-7	1	mg/kg	<1	5.63 mg/kg	102	85.4	114
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	88.9	76.2	108
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	103	77.7	110
EG005T: Cobalt	7440-48-4	2	mg/kg	<2	16 mg/kg	97.0	78.1	112
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	95.0	78.1	108
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	93.4	78.4	106
EG005T: Manganese	7439-96-5	5	mg/kg	<5	130 mg/kg	99.2	80.6	110
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	98.4	79.9	109
EG005T: Vanadium	7440-62-2	5	mg/kg	<5	29.6 mg/kg	96.6	78.5	106
EG005T: □inc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	99.8	79.1	110
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2649901)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	102	76.9	110
EP068A: Organochlorine Pesticides (OC) (QCLot: 2644417)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	96.3	71.8	126
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	97.4	72.2	125
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	90.2	74.2	124
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	94.7	69.1	124
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	84.3	65.1	125
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	71.7	66.6	122
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	105	71.8	123
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	91.2	71.1	124
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	90.9	64.8	128
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	95.9	70.2	126
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	79.1	72.1	124
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	95.9	68.0	122
EP068: 4.4□DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	99.2	73.0	124
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	90.4	55.8	130
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	103	72.0	124
EP068: 4.4□DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	103	72.0	127
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	85.0	66.3	131
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	92.1	62.4	131
EP068: 4.4□DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	69.2	55.4	130

Sub-Matrix: **SOIL**

EP068A: Organochlorine Pesticides (OC) (QCLot: 2644417) - continued								
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	79.4	68.8	128
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	72.8	55.5	132

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2649900)							
EM1917201-010	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	95.8	78.0	124
		EG005T: Beryllium	7440-41-7	50 mg/kg	103	85.0	125
		EG005T: Cadmium	7440-43-9	50 mg/kg	94.8	84.0	116
		EG005T: Chromium	7440-47-3	50 mg/kg	98.5	79.0	121
		EG005T: Copper	7440-50-8	50 mg/kg	102	82.0	124
		EG005T: Lead	7439-92-1	50 mg/kg	94.4	76.0	124
		EG005T: Manganese	7439-96-5	50 mg/kg	88.6	68.0	136
		EG005T: Nickel	7440-02-0	50 mg/kg	95.9	78.0	120
		EG005T: Vanadium	7440-62-2	50 mg/kg	97.9	76.0	124
		EG005T: Zinc	7440-66-6	50 mg/kg	92.3	74.0	128
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2649901)							
EM1917201-010	Anonymous	EG035T: Mercury	7439-97-6	0.5 mg/kg	107	76.0	116
EP068A: Organochlorine Pesticides (OC) (QCLot: 2644417)							
EM1917234-002	QC03	EP068: gamma-BHC	58-89-9	0.5 mg/kg	71.4	22.0	139
		EP068: Heptachlor	76-44-8	0.5 mg/kg	72.6	18.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	96.9	23.0	136
		EP068: Dieldrin	60-57-1	0.5 mg/kg	112	42.0	136
		EP068: Endrin	72-20-8	0.5 mg/kg	110	23.0	146
		EP068: 4.4-DDT	50-29-3	0.5 mg/kg	73.3	20.0	133

Enviro Sample Vic

From: Harry Bacalis
Sent: Monday, 21 October 2019 2:03 PM
To: Finn Otley
Cc: Enviro Sample Vic; Catherine Wilson
Subject: RE: Leachability testing for 1000511

No worries Finn

Ca[illegible] STD TAT

Kind regards

Harry Bacalis
Phone: +61 3 8564 5064
Mobile: +61 4[illegible] 858 [illegible]
Email: HarryBacalis@eurofins.com

From: Finn Otley [mailto:FOtley@tonkintaylor.com.au]
Sent: Monday, 21 October 2019 1:39 PM
To: Harry Bacalis
Subject: Leachability testing for 1000511

Parent 679599

EXTERNAL EMAIL

Hi Harry,

Could you please conduct ASLP leachability testing for the following samples and corresponding metals – from our job reference 1000511.

DAM1, DAM2 – Chromium (III+VI)
TP26-0.1 – Cobalt
TP31-0.1, CAT1 – Copper
TP26-0.1 – Manganese
TP26-0.1, TP75-0.1 – Nickel
DRAIN3 – Zinc

D: 23/10/19

S642349 – G#44
S642350 – G#44
S642324 – G#39
S642346 – G#40
S642325 – G#39
S642353 – G#44
S642347 – G#41

Thanks,

Finn Otley | Environmental Engineer
BEng(EnvEng)Hons
Tonkin + Taylor – **Exceptional thinking together**
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Tonkin+Taylor

To send me large files you can use my file drop

683038A
23/10/19
2:03pm

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NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**Tonkin & Taylor P/L**
Contact name:	Finn Otley
Project ID:	1000511
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Oct 21, 2019 2:03 PM
Eurofins reference:	**683682**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Harry Bacalis on Phone : or by e.mail: HarryBacalis@eurofins.com

Results will be delivered electronically via e.mail to Finn Otley - FOtley@tonkintaylor.com.au.

Tonkin & Taylor P/L
Level 3, 99 Coventry St
Southbank
VIC 3006

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Finn Otley**

Report **683682-L**
Project name
Project ID 1000511
Received Date Oct 21, 2019

Client Sample ID			**DAM1**	**DAM2**	**TP26-0.1**	**TP11-0.1**
Sample Matrix			**AUS Leachate**	**AUS Leachate**	**AUS Leachate**	**AUS Leachate**
Eurofins Sample No.			**M19-Oc31298**	**M19-Oc31299**	**M19-Oc31300**	**M19-Oc31301**
Date Sampled			**Not Provided**	**Not Provided**	**Not Provided**	**Not Provided**
Test/Reference	LOR	Unit				
Chromium (hexavalent)	0.05	mg/L	< 0.05	< 0.05	-	-
Chromium (trivalent)	0.05	mg/L			-	-
Heavy Metals						
Chromium	0.01	mg/L	0.02	< 0.01	-	-
Cobalt	0.01	mg/L	-	-	< 0.01	-
Copper	0.01	mg/L	-	-	-	< 0.01
Manganese	0.01	mg/L	-	-	0.07	-
Nickel	0.01	mg/L	-	-	0.02	-
AUS Leaching Procedure						
Leachate Fluid[C01]		comment	1.0	1.0	1.0	1.0
pH (initial)	0.1	pH Units	7.0	7.7	7.0	7.9
pH (Leachate fluid)	0.1	pH Units	5.1	5.1	5.1	5.1
pH (off)	0.1	pH Units	5.0	5.2	5.1	5.6

Client Sample ID			**CAT1**	**TP25-0.1**	**DRAIN3**
Sample Matrix			**AUS Leachate**	**AUS Leachate**	**AUS Leachate**
Eurofins Sample No.			**M19-Oc31302**	**M19-Oc31303**	**M19-Oc31304**
Date Sampled			**Not Provided**	**Not Provided**	**Not Provided**
Test/Reference	LOR	Unit			
Heavy Metals					
Copper	0.01	mg/L	< 0.01	-	-
Nickel	0.01	mg/L	-	< 0.01	-
Zinc	0.01	mg/L	-	-	0.80
AUS Leaching Procedure					
Leachate Fluid[C01]		comment	1.0	1.0	1.0
pH (initial)	0.1	pH Units	7.6	8.6	7.1
pH (Leachate fluid)	0.1	pH Units	5.1	5.1	5.1
pH (off)	0.1	pH Units	5.4	6.1	5.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Chromium (speciated)			
Chromium (hexavalent)	Melbourne	Oct 22, 2019	28 Days
- Method: APHA 3500-Cr Hexavalent Chromium- (Extraction:- USEPA3060)			
Heavy Metals	Melbourne	Oct 22, 2019	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
AUS Leaching Procedure			
pH (initial)	Melbourne	Oct 22, 2019	0 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			
pH (Leachate fluid)	Melbourne	Oct 22, 2019	0 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			
pH (off)	Melbourne	Oct 22, 2019	0 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			

eurofins | Environment Testing

ABN – 50 005 085 521
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NATA # 1261
Site # 1254 & 14271

Sydney
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NATA # 1261 Site # 18217

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NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: Tonkin & Taylor P/L
Address: Level 3, 99 Coventry St
Southbank
VIC 3006

Project Name:
Project ID: 1000511

Order No.:
Report #: 683682
Phone: 03 9863 8686
Fax: 03 9863 8685

Received: Oct 21, 2019 2:03 PM
Due: Oct 28, 2019
Priority: 5 Day
Contact Name: Finn Otley

Eurofins Analytical Services Manager : Harry Bacalis

Sample Detail						Cobalt	Copper	Manganese	Nickel	Zinc	AUS Leaching Procedure	Chromium (speciated)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	DAM1	Not Provided		AUS Leachate	M19-Oc31298						X	X
2	DAM2	Not Provided		AUS Leachate	M19-Oc31299						X	X
3	TP26-0.1	Not Provided		AUS Leachate	M19-Oc31300	X		X	X		X	
4	TP11-0.1	Not Provided		AUS Leachate	M19-Oc31301		X				X	
5	CAT1	Not Provided		AUS Leachate	M19-Oc31302		X				X	
6	TP25-0.1	Not Provided		AUS Leachate	M19-Oc31303				X		X	
7	DRAIN3	Not Provided		AUS Leachate	M19-Oc31304					X	X	
Test Counts						1	2	1	2	1	7	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Heavy Metals							
Chromium	mg/L	< 0.01			0.01	Pass	
Cobalt	mg/L	< 0.01			0.01	Pass	
Copper	mg/L	< 0.01			0.01	Pass	
Manganese	mg/L	< 0.01			0.01	Pass	
Nickel	mg/L	< 0.01			0.01	Pass	
Zinc	mg/L	< 0.01			0.01	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Chromium	M19-Oc32211	NCP	%	96			75-125	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Cobalt	M19-Oc32211	NCP	%	94			75-125	Pass	
Manganese	M19-Oc32211	NCP	%	94			75-125	Pass	
Nickel	M19-Oc32211	NCP	%	92			75-125	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Copper	M19-Oc32211	NCP	%	93			75-125	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Zinc	M19-Oc32211	NCP	%	94			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Chromium	M19-Oc32211	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Cobalt	M19-Oc32211	NCP	mg/L	0.01	0.01	2.0	30%	Pass	
Manganese	M19-Oc32211	NCP	mg/L	0.42	0.42	1.0	30%	Pass	
Nickel	M19-Oc32211	NCP	mg/L	0.02	0.02	11	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Copper	M19-Oc32211	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Zinc	M19-Oc32211	NCP	mg/L	0.17	0.19	9.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other

Authorised By

Harry Bacalis	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Julie Kay	Senior Analyst-Inorganic (VIC)

Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

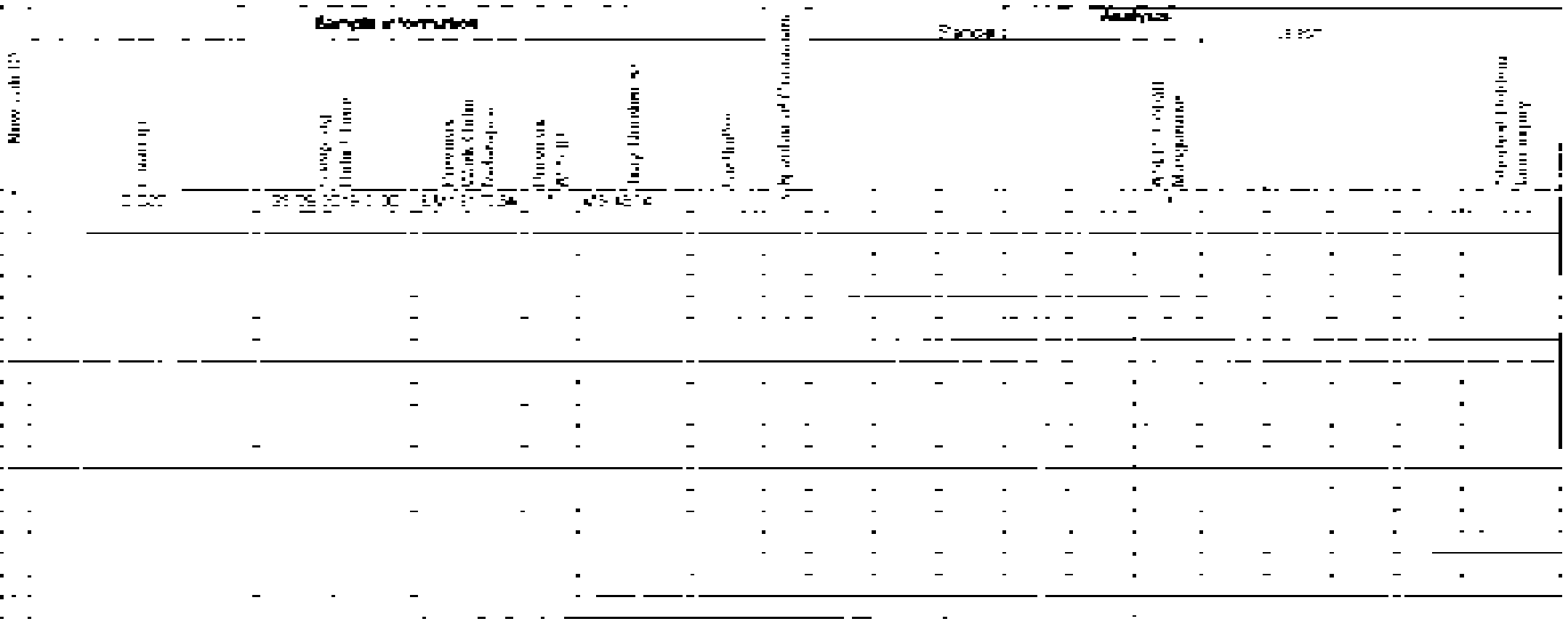
- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Rebatch

EM1917530



Scott Huett

From:	[illegible]
Sent:	Monday [illegible] October 2019 [illegible] PM
To:	[illegible]
Subject:	EXTERNAL: [illegible] testing for [illegible]
Follow Up Flag:	Follow up
Flag Status:	Completed

[illegible]

Hi [illegible],

Could you please [illegible] testing for the following [illegible] job reference [illegible]

GC02 – Cobalt and Manganese

Thanks,

[illegible] | Environmental Engineer

[illegible]

Tonkin + Taylor – Exceptional thinking together

[illegible]

Australia

T [illegible] M [illegible] www.tonkintaylor.com.au [illegible]

Tonkin+Taylor

To send me large files you can use my file drop

Tonkin+Taylor 60 years

Exceptional thinking together

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1917680**	Page	: 1 of 4
Client	: **TONKIN AND TAYLOR PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: MR RHIAN OWEN	Contact	: Kane Vorwerk
Address	: GROUND FLOOR 95 COVENTRY STREET SOUTHBANK VIC 3006	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: +61 03 9863 8686	Telephone	: +6138549 9652
Project	: 1000511	Date Samples Received	: 15-Oct-2019 08:45
Order number	: ----	Date Analysis Commenced	: 24-Oct-2019
C-O-C number	: ----	Issue Date	: 25-Oct-2019 16:43
Sampler	: ----		
Site	: ----		
Quote number	: EN/333 Secondary Work		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC

□□□□ □ □□ □ □□□

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
□ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

□ This is a rebatch of EM1917234.

Sub-Matrix: **ASLP LEACHATE** (Matrix: **WATER**)			Client sample ID	**QC02**	**----**	**----**	**----**	**----**
			Client sampling date / time	25-Sep-2019 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**EM1917680-001**	**--------**	**--------**	**--------**	**--------**
				Result	----	----	----	----
EG005(ED093)C: Leachable Metals by ICPAES								
Cobalt	7440-48-4	0.1	mg/L	<0.1	**----**	**----**	**----**	**----**
Manganese	7439-96-5	0.1	mg/L	<0.1	**----**	**----**	**----**	**----**

Sub-Matrix: **SOIL** (Matrix: **SOIL**)				Client sample ID	QC02	----	----	----	----
				Client sampling date / time	25-Sep-2019 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EM1917680-001	--------	--------	--------	--------	
				Result	----	----	----	----	
EN60: ASLP Leaching Procedure									
Initial pH	----	0.1	pH Unit	**6.8**	----	----	----	----	
After HCl pH	----	0.1	pH Unit	**1.6**	----	----	----	----	
Extraction Fluid pH	----	0.1	pH Unit	**5.0**	----	----	----	----	
Final pH	----	0.1	pH Unit	**5.0**	----	----	----	----	

QUALITY CONTROL REPORT

Work Order	: **EM1917680**	Page	: 1 of 3
Client	: **TONKIN AND TAYLOR PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: MR RHIAN OWEN	Contact	: Kane Vorwerk
Address	: GROUND FLOOR 95 COVENTRY STREET SOUTHBANK VIC 3006	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: +61 03 9863 8686	Telephone	: +6138549 9652
Project	: 1000511	Date Samples Received	: 15-Oct-2019
Order number	: ----	Date Analysis Commenced	: 24-Oct-2019
C-O-C number	: ----	Issue Date	: 25-Oct-2019
Sampler	: ----		
Site	: ----		
Quote number	: EN/333 Secondary Work		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report Recovery and Acceptance Limits
- Matrix Spike (MS) Report Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
= Indicates failed QC

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit Result between 10 and 20 times LOR: 0% - 50% Result 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

EG005(ED093)C: Leachable Metals by ICPAES (QC Lot: 2664089)									
EM1917680-001	QC02	EG005C: Cobalt	7440-48-4	0.1	mg/L	<0.1	<0.1	0.00	No Limit
		EG005C: Manganese	7439-96-5	0.1	mg/L	<0.1	<0.1	0.00	No Limit

Method / Laboratory Blank and Laboratory Control Spike (LCS) Results

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB)	Laboratory Control Spike (LCS) Report			
				Report	Spike Concentration	Recovery Limits (%)		
Analyte	CAS Number	LOR	Unit	Result		Low	High	
EG005(ED093)C: Leachable Metals by ICPAES (QCLot: 2664089)								
EG005C: Cobalt	7440-48-4	0.1	mg/L	<0.1	1 mg/L	92.1	81.9	110
EG005C: Manganese	7439-96-5	0.1	mg/L	<0.1	1 mg/L	94.5	82.0	111

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Concentration	Low	High	
EG005(ED093)C: Leachable Metals by ICPAES (QCLot: 2664089)							
EM1917686-001	Anonymous	EG005C: Cobalt	7440-48-4	1 mg/L	88.2	87.0	117
		EG005C: Manganese	7439-96-5	1 mg/L	92.6	85.0	119

Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM1917680**	Page	: 1 of 4
Client	: **TONKIN AND TAYLOR PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: MR RHIAN OWEN	Telephone	: +6138549 9652
Project	: 1000511	Date Samples Received	: 15-Oct-2019
Site	: ----	Issue Date	: 25-Oct-2019
Sampler	: ----	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

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This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

□ □□□□ □ □□ □□ □□□□ □□ □□□□ □□□ □ □□ □ □□□□□

- **NO Analysis Holding Time Outliers exist.**

□ □□□□ □ □□ □□□□□□□ □□□ □□ □□□ □□□□ □□□ □ □□

- **NO Quality Control Sample Frequency Outliers exist.**

Ana ysis Ho ding Time omp iance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VO soi s vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL** Evaluation: û = Holding time breach ; ü = Within holding time.

□ □□□□□	□□□ □ □ □ □□□	Extraction / Preparation			Analysis		
ontaine / Client Sample ID(s)		Date e □t □cted	Due for extraction	Evaluation	Date □□□ □□□□	Due for analysis	Evaluation
EN60: ASLP Leaching Procedure							
Non-□olatile Leach: 180 day HT (e.g. PFAS, metals ex.Hg) (EN60a)							
QC02	**25-Sep-2019**	**24-Oct-2019**	23-Mar-2020	Π	**----**	----	----

Matrix: **WATER** Evaluation: û = Holding time breach ; ü = Within holding time.

□ ethod	S □mp e □□□	Extraction / Preparation			Analysis		
ontaine / Client Sample ID(s)		□□□ □□□ □□□□	Due for extraction	Evaluation	□□□ □□□ □□□□	Due for analysis	Evaluation
EG005(ED093)C: Leachable Metals by ICPAES							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG005C)							
QC02	**24-Oct-2019**	**25-Oct-2019**	21-Apr-2020	Π	**25-Oct-2019**	21-Apr-2020	ü

General Comments

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: = Quality Control frequency not within specification = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*			*Evaluation*	
Laboratory Duplicates (DUP)							
Leachable Metals by ICPAES	EG005C	1	1	**100.00**	**10.00**	Π	NEPM 2013 B3 ALS QC Standard
Laboratory Control Samples (LCS)							
Leachable Metals by ICPAES	EG005C	1	1	**100.00**	**5.00**	Π	NEPM 2013 B3 ALS QC Standard
Method Blanks (MB)							
Leachable Metals by ICPAES	EG005C	1	1	**100.00**	**5.00**	Π	NEPM 2013 B3 ALS QC Standard
Matrix Spikes (MS)							
Leachable Metals by ICPAES	EG005C	1	1	**100.00**	**5.00**	Π	NEPM 2013 B3 ALS QC Standard

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Leachable Metals by ICPAES	EG005C	SOIL	In house: referenced to APHA 3120 USEPA SW 846 - 6010: The ICPAES technique ionises leachate sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals in TCLP Leachate	EN25C	SOIL	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)
ASLP for Non Semivolatile Analytes	EN60a	SOIL	In house QWI-EN/60 referenced to AS4439.3 Preparation of Leachates

Envirolab Sample Vic

From: Harry Bacalis
Sent: Wednesday, 20 November 2019 3:50 PM
To: Rhian Owen
Cc: Envirolab Sample Vic
Subject: Re: Batches 679598 and 679599

No worries Rhian

Cenh - 3 Day [A]

Kind regards,

Sent from my Samsung Galaxy smartphone.

-------- Original message --------
From: Rhian Owen <[redacted]>
Date: 20/11/19 3:48 pm (GMT+10:00)
To: Harry Bacalis <[redacted]>
Subject: Batches 679598 and 679599

EXTERNAL EMAIL

Hi Harry, could you please arrange for the below additional samples on these batches to be analysed for Cobalt and Manganese and Dup [illegible]

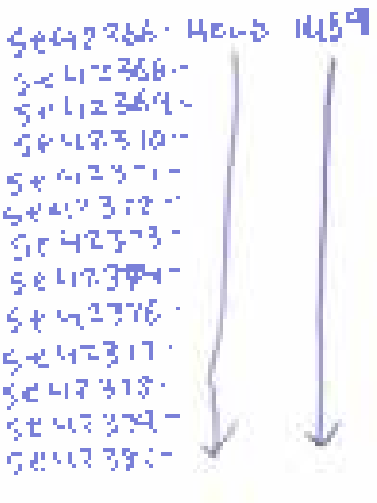
Batch: 679598

TP01-0.1
TP05-0.2
TP06-0.1
TP09-0.3
TP05-0.5
TP16-0.3
TP16-0.5
TP17-0.3
TP18-0.4
TP20-0.5 - [illegible]
TP21-0.5
TP22-0.5

Batch: 679599

TP24_0.3
TP24_0.5 [illegible]
TP25_0.5
TP26_0.3 [illegible]
TP27_0.2
TP28_0.3

TP29_0.3
TP30_0.5
TP31_0.3
TP32_0.3
TP33_0.5
TP34_0.3
TP35_0.5
TP37_0.2
TP38_0.2
TP39_0.2
TP40_0.2
TP42_0.2



Regards

Rhian Owen | Associate Environmental Scientist
BeAspic | The Science Hero
Tonkin + Taylor - Exceptional thinking together
Kings Technology Park, Level 1, 90 Coventry Street, Southbank, Vic 3006 | PO Box 1565, South Melbourne, Vic 3205, Australia
T +61396616666 M +61447560473 www.tonkintaylor.com.au in T+T profile

Tonkin+Taylor

To send me large files you can use my fileshare

Tonkin+Taylor 60 years

Exceptional thinking together

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NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**Tonkin & Taylor P/L**
Contact name:	Rhian Owen
Project name:	1000571
COC number:	Not provided
Turn around time:	3 Day
Date/Time received:	Nov 20, 2019 3:48 PM
Eurofins reference:	**689100**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Harry Bacalis on Phone : or by e.mail: HarryBacalis@eurofins.com

Results will be delivered electronically via e.mail to Rhian Owen - rowen@tonkintaylor.com.au.

Tonkin & Taylor P/L
Level 3, 99 Coventry St
Southbank
VIC 3006

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Rhian Owen**

Report **689100-S**
Project name 1000571
Received Date Nov 20, 2019

Client Sample ID			**TP01-0.3**	**TP05-0.3**	**TP06-0.3**	**TP09-0.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**M19-No27937**	**M19-No27938**	**M19-No27939**	**M19-No27940**
Date Sampled			**Sep 24, 2019**	**Sep 24, 2019**	**Sep 24, 2019**	**Sep 24, 2019**
Test/Reference	LOR	Unit				
Heavy Metals						
Cobalt	5	mg/kg	< 5	< 5	210	30
Manganese	5	mg/kg	92	45	930	1600
% Moisture	1	%	14	16	26	23

Client Sample ID			**TP09-0.5**	**TP16-0.3**	**TP16-0.5**	**TP17-0.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**M19-No27941**	**M19-No27942**	**M19-No27943**	**M19-No27944**
Date Sampled			**Sep 24, 2019**	**Sep 24, 2019**	**Sep 24, 2019**	**Sep 24, 2019**
Test/Reference	LOR	Unit				
Heavy Metals						
Cobalt	5	mg/kg	67	50	77	22
Manganese	5	mg/kg	490	470	730	420
% Moisture	1	%	26	29	28	26

Client Sample ID			**TP18-0.4**	**TP20-0.5**	**TP21-0.5**	**TP22-0.5**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**M19-No27945**	**M19-No27946**	**M19-No27947**	**M19-No27948**
Date Sampled			**Sep 24, 2019**	**Sep 24, 2019**	**Sep 24, 2019**	**Sep 24, 2019**
Test/Reference	LOR	Unit				
Heavy Metals						
Cobalt	5	mg/kg	32	23	20	24
Manganese	5	mg/kg	230	150	380	490
% Moisture	1	%	27	27	31	26

Client Sample ID			TP24-0.3	TP24-0.5 (0.6)	TP25-0.5	TP26-0.3 (0.2)
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-No27949	M19-No27950	M19-No27951	M19-No27952
Date Sampled			Sep 25, 2019	Sep 25, 2019	Sep 25, 2019	Sep 25, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Cobalt	5	mg/kg	33	17	150	92
Manganese	5	mg/kg	570	240	2800	3000
% Moisture	1	%	27	31	25	28

Client Sample ID			TP27-0.2	TP28-0.3	TP29-0.3	TP30-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-No27953	M19-No27954	M19-No27955	M19-No27956
Date Sampled			Sep 25, 2019	Sep 25, 2019	Sep 25, 2019	Sep 25, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Cobalt	5	mg/kg	170	24	13	55
Manganese	5	mg/kg	1800	410	370	1100
% Moisture	1	%	20	34	34	26

Client Sample ID			TP31-0.3	TP32-0.3	TP32-0.5	TP33-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-No27957	M19-No27958	M19-No27959	M19-No27960
Date Sampled			Sep 25, 2019	Sep 25, 2019	Sep 25, 2019	Sep 25, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Cobalt	5	mg/kg	43	40	88	170
Manganese	5	mg/kg	960	840	1400	4100
% Moisture	1	%	29	31	31	35

Client Sample ID			TP34-0.3	TP35-0.3	TP37-0.2	TP38-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-No27961	M19-No27962	M19-No27963	M19-No27964
Date Sampled			Sep 25, 2019	Sep 25, 2019	Sep 25, 2019	Sep 25, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Cobalt	5	mg/kg	36	160	35	38
Manganese	5	mg/kg	850	2000	5000	1700
% Moisture	1	%	32	34	23	27

Client Sample ID			TP39-0.2	TP40-0.2	TP42-0.2
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**M19-No27965**	**M19-No27966**	**M19-No27967**
Date Sampled			**Sep 25, 2019**	**Sep 25, 2019**	**Sep 25, 2019**
Test/Reference	LOR	Unit			
Heavy Metals					
Cobalt	5	mg/kg	100	110	23
Manganese	5	mg/kg	2100	2800	2500
% Moisture	1	%	27	23	23

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Heavy Metals	Melbourne	Nov 21, 2019	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Melbourne	Nov 20, 2019	14 Days
- Method: LTM-GEN-7080 Moisture			

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NATA # 1261
Site # 23736

Company Name:	Tonkin & Taylor P/L	**Order No.:**	
Address:	Level 3, 99 Coventry St Southbank VIC 3006	**Report #:** **Phone:** **Fax:**	689100 03 9863 8686 03 9863 8685
Project Name:	1000571		

Received:	Nov 20, 2019 3:48 PM
Due:	Nov 25, 2019
Priority:	3 Day
Contact Name:	Rhian Owen

Eurofins Analytical Services Manager : Harry Bacalis

Sample Detail						Cobalt	Manganese	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	TP01-0.3	Sep 24, 2019		Soil	M19-No27937	X	X	X
2	TP05-0.3	Sep 24, 2019		Soil	M19-No27938	X	X	X
3	TP06-0.3	Sep 24, 2019		Soil	M19-No27939	X	X	X
4	TP09-0.3	Sep 24, 2019		Soil	M19-No27940	X	X	X
5	TP09-0.5	Sep 24, 2019		Soil	M19-No27941	X	X	X
6	TP16-0.3	Sep 24, 2019		Soil	M19-No27942	X	X	X
7	TP16-0.5	Sep 24, 2019		Soil	M19-No27943	X	X	X
8	TP17-0.3	Sep 24, 2019		Soil	M19-No27944	X	X	X
9	TP18-0.4	Sep 24, 2019		Soil	M19-No27945	X	X	X
10	TP20-0.5	Sep 24, 2019		Soil	M19-No27946	X	X	X

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Company Name:	Tonkin & Taylor P/L	**Order No.:**		**Received:**	Nov 20, 2019 3:48 PM
Address:	Level 3, 99 Coventry St Southbank VIC 3006	**Report #:**	689100	**Due:**	Nov 25, 2019
		Phone:	03 9863 8686	**Priority:**	3 Day
		Fax:	03 9863 8685	**Contact Name:**	Rhian Owen
Project Name:	1000571				

Eurofins Analytical Services Manager : Harry Bacalis

Sample Detail						Cobalt	Manganese	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
11	TP21-0.5	Sep 24, 2019		Soil	M19-No27947	X	X	X
12	TP22-0.5	Sep 24, 2019		Soil	M19-No27948	X	X	X
13	TP24-0.3	Sep 25, 2019		Soil	M19-No27949	X	X	X
14	TP24-0.5 (0.6)	Sep 25, 2019		Soil	M19-No27950	X	X	X
15	TP25-0.5	Sep 25, 2019		Soil	M19-No27951	X	X	X
16	TP26-0.3 (0.2)	Sep 25, 2019		Soil	M19-No27952	X	X	X
17	TP27-0.2	Sep 25, 2019		Soil	M19-No27953	X	X	X
18	TP28-0.3	Sep 25, 2019		Soil	M19-No27954	X	X	X
19	TP29-0.3	Sep 25, 2019		Soil	M19-No27955	X	X	X
20	TP30-0.5	Sep 25, 2019		Soil	M19-No27956	X	X	X
21	TP31-0.3	Sep 25, 2019		Soil	M19-No27957	X	X	X
22	TP32-0.3	Sep 25, 2019		Soil	M19-No27958	X	X	X
23	TP32-0.5	Sep 25, 2019		Soil	M19-No27959	X	X	X

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Company Name:	Tonkin & Taylor P/L	**Order No.:**		**Received:**	Nov 20, 2019 3:48 PM
Address:	Level 3, 99 Coventry St Southbank VIC 3006	**Report #:**	689100	**Due:**	Nov 25, 2019
		Phone:	03 9863 8686	**Priority:**	3 Day
		Fax:	03 9863 8685	**Contact Name:**	Rhian Owen
Project Name:	1000571				

Eurofins Analytical Services Manager : Harry Bacalis

Sample Detail						Cobalt	Manganese	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
24	TP33-0.3	Sep 25, 2019		Soil	M19-No27960	X	X	X
25	TP34-0.3	Sep 25, 2019		Soil	M19-No27961	X	X	X
26	TP35-0.3	Sep 25, 2019		Soil	M19-No27962	X	X	X
27	TP37-0.2	Sep 25, 2019		Soil	M19-No27963	X	X	X
28	TP38-0.2	Sep 25, 2019		Soil	M19-No27964	X	X	X
29	TP39-0.2	Sep 25, 2019		Soil	M19-No27965	X	X	X
30	TP40-0.2	Sep 25, 2019		Soil	M19-No27966	X	X	X
31	TP42-0.2	Sep 25, 2019		Soil	M19-No27967	X	X	X
Test Counts						31	31	31

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Heavy Metals									
Cobalt			mg/kg	< 5			5	Pass	
Manganese			mg/kg	< 5			5	Pass	
LCS - % Recovery									
Heavy Metals									
Cobalt			%	117			80-120	Pass	
Manganese			%	114			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Heavy Metals				Result 1					
Cobalt	M19-No27938	CP	%	101			75-125	Pass	
Manganese	M19-No27938	CP	%	90			75-125	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Cobalt	M19-No27948	CP	%	100			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Cobalt	M19-No27937	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M19-No27937	CP	%	14	15	6.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Cobalt	M19-No27938	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Manganese	M19-No27938	CP	mg/kg	45	46	3.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Cobalt	M19-No27947	CP	mg/kg	20	29	39	30%	Fail	Q08
Manganese	M19-No27947	CP	mg/kg	380	440	16	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M19-No27947	CP	%	31	30	3.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Cobalt	M19-No27948	CP	mg/kg	24	23	5.0	30%	Pass	
Manganese	M19-No27948	CP	mg/kg	490	470	4.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Cobalt	M19-No27957	CP	mg/kg	43	33	24	30%	Pass	
Manganese	M19-No27957	CP	mg/kg	960	780	21	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M19-No27957	CP	%	29	29	1.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Cobalt	M19-No27958	CP	mg/kg	40	46	14	30%	Pass	
Manganese	M19-No27958	CP	mg/kg	840	970	14	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Cobalt	M19-No27967	CP	mg/kg	23	31	29	30%	Pass	
Manganese	M19-No27967	CP	mg/kg	2500	3300	29	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M19-No27967	CP	%	23	22	8.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.

Authorised By

Harry Bacalis	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)

Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Appendix G: Prensa Preliminary Site Investigation

Phase 1 Environmental Site Assessment
Lilydale Quarry
Melba Avenue, Lilydale, Victoria

Places Victoria

29 June 2015

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Malvern VIC 3144

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Statement of Limitations

This document has been prepared in response to specific instructions from Places Victoria to whom the report has been addressed. The work has been undertaken with the usual care and thoroughness of the consulting profession. The work is based on generally accepted standards, practices of the time the work was undertaken. No other warranty, expressed or implied, is made as to the professional advice included in this report.

The report has been prepared for the use by Places Victoria and Sibelco Australia Limited and the use of this report by other parties may lead to misinterpretation of the issues contained in this report. To avoid misuse of this report, Prensa advise that the report should only be relied upon by Places Victoria and those parties expressly referred to in the introduction of the report. The report should not be separated or reproduced in part and Prensa should be retained to assist other professionals who may be affected by the issues addressed in this report to ensure the report is not misused in any way.

Prensa is not a professional quantity surveyor (QS) organisation. Any areas, volumes, tonnages or any other quantities noted in this report are indicative estimates only. The services of a professional QS organisation should be engaged if quantities are to be relied upon.

Sampling Risks

Prensa acknowledges that any scientifically designed sampling program cannot guarantee all sub-surface contamination will be detected. Sampling programs are designed based on known or suspected site conditions and the extent and nature of the sampling and analytical programs will be designed to achieve a level of confidence in the detection of known or suspected subsurface contamination. The sampling and analytical programs adopted will be those that maximises the probability of identifying contaminants. Places Victoria must therefore accept a level of risk associated with the possible failure to detect certain sub-surface contamination where the sampling and analytical program misses such contamination. Prensa will detail the nature and extent of the sampling and analytical program used in the investigation in the investigation report provided.

Environmental site assessments identify actual subsurface conditions only at those points where samples are taken and when they are taken. Soil contamination can be expected to be non-homogeneous across the stratified soils where present on site, and the concentrations of contaminants may vary significantly within areas where contamination has occurred. In addition, the migration of contaminants through groundwater and soils may follow preferential pathways, such as areas of higher permeability, which may not be intersected by sampling events. Subsurface conditions including contaminant concentrations can also change over time. For this reason, the results should be regarded as representative only.

Places Victoria recognises that sampling of subsurface conditions may result in some cross contamination. All care will be taken and the industry standards used to minimise the risk of such cross contamination occurring, however, Places Victoria recognises this risk and waives any claims against Prensa and agrees to defend, indemnify and hold Prensa harmless from any claims or liability for injury or loss which may arise as a result of alleged cross contamination caused by sampling.

Reliance on Information Provided by Others

Prensa notes that where information has been provided by other parties in order for the works to be undertaken, Prensa cannot guarantee the accuracy or completeness of this information. Places Victoria therefore waives any claim against the company and agrees to indemnify Prensa for any loss, claim or liability arising from inaccuracies or omissions in information provided to Prensa by third parties. No indications were found during our investigations that information contained in this report, as provided to Prensa, is false.

Recommendations for Further Study

The industry recognised methods used in undertaking the works may dictate a staged approach to specific investigations. The findings therefore of this report may represent preliminary findings in accordance with these industry recognised methodologies. In accordance with these methodologies, recommendations contained in this report may include a need for further investigation or analytical analysis. The decision to accept these recommendations and incur additional costs in doing so will be at the sole discretion of Places Victoria and Prensa recognises that Places Victoria will consider their specific needs and the business risks involved. Prensa does not accept any liability for losses incurred as a result of Places Victoria not accepting the recommendations made within this report.

Executive Summary

Prensa Pty Ltd (Prensa) was engaged by Places Victoria on behalf of Sibelco Australia Limited (Sibelco) to conduct a Phase 1 Environmental Site Assessment (PESA) of the Lilydale Quarry located at Melba Avenue, Lilydale, Victoria (the site).

The objective of the PESA was to provide an indication of the potential for contamination and/or sources of contamination to be present at the site as a result of current and/or historical land use activities. The PESA will also assist in the preparation of a Development Plan and will support a Planning Scheme Amendment submission for the rezoning of the site to a Comprehensive Development Zone.

Based on a review of site history resources, it is understood that the site has been utilised for extractive quarrying and farming activities for over 130 years.

The site is situated in a generally residential and commercial precinct. The Lilydale Railway Line runs in a general north-south alignment through the site.

Sensitive receptors in the vicinity of the site are considered to include adjoining residential properties and schools, and nearby surface waters including Olinda Creek and Lilydale Lake. There is also the potential for groundwater in the vicinity of the site to be abstracted for domestic purposes.

From the available site history records reviewed and a limited site inspection undertaken by Prensa, potential contamination sources associated with current and/or historical land uses were identified to be present at the site.

The nature of the potential contamination is not considered likely to preclude the site from being redeveloped for sensitive land uses, subject to a Certificate or Statement of Environmental Audit being obtained.

There is the opportunity that future proposed development of the site could be effectively rehabilitated to support sensitive land uses, however, it is likely that certain areas of the site would require a higher degree of environmental assessment and/or remediation to support sensitive uses.

A summary of the opportunities and constraints for the developable potential for the site as a result of the currently known condition of the site is detailed in the table on the following page:

Area	Potential Constraint	Potential Opportunities
Area B – Main Plant & Offices	• Time constraint: Requires plant cessation, decommissioning and land forming of final levels for the proposed end use, recommended prior to assessment of this area. • Process constraint: Change in land use to a 'sensitive' use likely to trigger a Statutory Environmental Audit.	• Based on available historical information and current site walkover, appears to be a limited quantity of imported potential contaminants within selected areas. As such these areas could be individually readily assessed in the short term, subject to cessation of current activities.
Area C – Quarry Pit	• Time constraint: Material ear-marked for placement in quarry pit would require appropriate assessment to establish the potential contamination status. • Process constraint: Change in land use to a 'sensitive' use likely to trigger a Statutory Environmental Audit.	• Based on available historical information, the composition of the overburden and stockpile material is unlikely to realise in significant contamination to the land surface environment. Predominantly understood to comprise natural material sourced from the onsite quarry. • Potential for this area to be redeveloped for various beneficial end uses – excluding any geotechnical and/or civil constraints.
Area D – Settling Pond	• Time constraint: Ongoing surface water treatment and monitoring during operational phase and decommissioning phase. • Removal of pond sludge. • Potentially impacted with alkaline sediments and other unknown potential contaminants at this stage. • Process constraint: Change in land use to a 'sensitive' use likely to trigger a Statutory Environmental Audit.	• Potential for this area to be redeveloped in to a wetland system or public facility amenable to existing offsite creek and lake systems.
Area E – Overburden Stockpile & General Stockpile Area	• Potential for unknown historical contaminant deposition within stockpile (i.e. at depth). • Time constraint: Final land surface only amenable to be assessed following removal of overburden and stockpile material. • Process constraint: Change in land use to a 'sensitive' use likely to trigger a Statutory Environmental Audit.	• Based on available historical information, the composition of the overburden and stockpile material is unlikely to release significant contamination to the land surface environment. Predominantly understood to comprise natural material sourced from the onsite quarry. • Potential for the natural 'artesian' spring to form part of a future land surface feature.
Area F – Grazing Paddocks (incorporating 'Cricket Ground')	• Potentially impacted with contaminants such as, but not limited to, pesticides, weedicides, herbicides, nitrates and bacteria. • Process constraint: Change in land use to a 'sensitive' use likely to trigger a Statutory Environmental Audit.	• Area readily accessible to be assessed in current status. • There is the potential that this area may be conditionally suitable for sensitive land use redevelopment.

In summary, the abovementioned discussion of potential opportunities and constraints is somewhat dependent upon the timing of cessation and decommissioning of infrastructure at the site.

In light of the nature of the historical and current activities undertaken at the site, whilst selected areas may require targeted remedial effort, the potential for significant and extensive land surface impacts is, at this stage, considered unlikely.

A more detailed environmental site assessment may be required to evaluate the condition of the land (i.e. soil, surface water and groundwater) prior to any future proposed land use.

It is also recognised that any planning scheme amendment to rezone the land to allow sensitive uses will need to consider relevant Environmental Audit Overlay (EAO) requirements. This may include the need to obtain a Certificate or Statement of Environmental Audit in accordance with the *Environment Protection Act 1970* prior to the commencement of development works associated with sensitive land use, such as residential.

Table of Contents

1 Introduction

Prensa Pty Ltd (Prensa) was engaged by Places Victoria on behalf of Sibelco Australia Limited (Sibelco) to conduct a Phase 1 Environmental Site Assessment (PESA) of the Lilydale Quarry located at Melba Avenue, Lilydale, Victoria (the site).

The objective of the PESA is to provide an indication of the potential for contaminating land use activities and/or sources of contamination to be present at the site as a result of current and/or historical land usage.

The PESA will be used to support the submission of a planning scheme amendment to rezone the site to a Comprehensive Development Zone.

2 Background

The site is located in Lilydale and is broadly bounded by Maroondah Highway to the north, the Stage 1 quarry land and Hull Road to the south, Mooroolbark Road to the west and residential subdivision to the east. The grounds of Swinburne University Lilydale campus and an existing area of commercial/industrial development share the northeast boundary of the site.

The location of the site is provided as **Figure 1** attached.

The site is currently an operational limestone quarry utilised by Sibelco. Extractive quarrying activities commenced at the site in 1878 following the purchase of Cave Hill Farm by David Mitchell and the subsequent establishment of the Cave Hill Limestone and Marble Quarry. Prior to the commencement of quarrying activities at the site, Cave Hill was a prominent landscape feature and was known as a major limestone deposit.

Since 1878, the limestone deposit at Cave Hill has been utilised for the production of lime and cement for agricultural and construction purposes since the open cut mining activities commenced. Quicklime, hydrated lime and various limestone products have been manufactured at the quarry facility for over 130 years.

The Cave Hill Butter, Cheese and Bacon Curing Factory was also located at the site which was established around 1892 (*The Argus*, 1893).

The site is proposed for future redevelopment for mixed use including low to medium density residential, commercial and public open space uses.

It is noted that a Certificate of Environmental Audit has been obtained for the Stage 1 portion of the Lilydale Quarry land. In 2014, the Stage 1 land was rezoned from Special Use Zone to General Residential Zone, facilitating planning approval for the subdivision of the land into 147 residential allotments and the removal of native vegetation, subject to permit conditions. The location of Stage 1 is shown in **Figure 2** attached.

This report focuses on the environmental condition of the balance of the quarry site.

3 Objective

The objective of the PESA was to:

- Identity potentially contaminating land use activities and/or sources of contamination at the site as a result of current and/or historical land usage undertaken at the site;

- Identify opportunities and constraints for the developable potential for the site as a result of the currently known condition of the site; and
- Provide recommendations (if any) for further assessment to be undertaken.

The PESA aims to provide Places Victoria with a preliminary assessment of the feasibility of redevelopment of the site, to support the preparation of a Development Plan and a Panning Scheme Amendment for the rezoning of the site to a Comprehensive Development.

4 Methodology

The scope of work for the PESA included a desktop review of available historical information and limited site records made available by Sibelco, a limited site walkover and interview with site representatives, to identify current and historical land uses at the site that may have resulted in potential contamination to the land, surface water and groundwater environments.

In completing the PESA, Prensa undertook the following:

- A site history review, including:
  - Historical aerial photographs;
  - Historical and current certificates of title;
  - Melbourne Metropolitan Board of Works plans and/or historical Melway Editions';
  - Published documentation and records available at local library and/or on-line sources;
  - Victorian WorkSafe Freedom of Information;
  - Victorian EPA Licencing;
  - Available site plans, registers, reports, licences and other records as made available by Sibelco; and
  - Interview with current Sibelco employee/s knowledgeable of historical and/or current land use activities conducted at the site.
- A general desktop documentation review, including:
  - Review of two (2) previous environmental assessment reports and one (1) environmental audit report pertaining to portions of the site;
  - Review of completed certificates and statements of environmental audit for nearby properties;
  - Topographical, geological and hydrogeological maps;
  - Subsurface utility plans made available by Dial Before You Dig;
  - EPA Victoria Priority Sites Register search; and
  - Victorian Groundwater Database search.
- A limited site inspection including discussions with site personnel, with particular attention paid to the following:
  - Surrounding properties and land uses;
  - Potential sources of contamination (i.e. plant processes and facilities, sources of hazardous materials, underground storage tanks, pits and/or sumps, areas of imported fill, debris and rubble, waste storage, etc);
  - Discoloured or stained soil, affected plant growth or odours;
  - Surface water run-off flow direction and drainage locations;
  - Potentially impacted surface water, or surface water displaying a sheen; and

  - Potential areas of environmental risk, including a visual assessment of the potential for soil, groundwater or surface water contamination to exist.
- Preparation of this PESA report.

The PESA did not include an intrusive appraisal of the condition of soil, surface water or groundwater at the site.

The PESA was conducted in general accordance with the following guidelines:

- State Environment Protection Policy (SEPP), Prevention and Management of Contamination of Land, 2002;
- National Environment Protection (Assessment of Site Contamination) Amendment Measure 1999 (April 2013) (NEPM 2013); and
- Australian Standard 4482.1-2005, Guide to Investigation and Sampling of Sites with Potentially Contaminated Soil, Part 1: Non-volatile and semi-volatile compounds, 2005.

5 Site Description

5.1 Site Location

The site is located on the south-eastern corner of the Maroondah Highway and Mooroolbark Road, approximately 800 m southwest of the Lilydale town centre and approximately 35 km east of the Melbourne CBD (refer to **Figure 1**).

5.2 Site Features

The site occupies an area of approximately 144 hectares (excluding the Stage 1 area of approximately 20 hectares) and comprises an open cut quarry, limestone processing plant facilities and ancillary buildings for office, storage and maintenance uses.

The quarry pit occupies the central portion of the site and is approximately 300 metres by 460 metres in size. The quarry pit is bordered to the west and south by buffer zones which are generally undeveloped, and to the east by overburden stockpiles and processing facilities.

The Lilydale Railway Line runs in a general north-south alignment through the site adjacent to the western rim of the quarry pit.

The main manufacturing and processing facilities including lime kilns and several ancillary office, maintenance and storage buildings are located north of the quarry pit.

5.3 Planning and Zoning

Zoning information was obtained from the Department of Environment, Land, Water and Planning (DELWP). The Planning Scheme indicates that the site is currently zoned Special Use Zone – Schedule 1 (SUZ1), which allows use and development of the site for earth and energy resources industry.

The site is proposed for rezoning to a 'Comprehensive Development Zone'.

Review of the Planning Scheme also indicates that various parts of the site are subject to the following overlays:

- Erosion Management Overlay (EMO);
- Public Acquisition Overlay (PAO) – Schedule PAO9; and
- Heritage Overlay (HO) – Schedule HO57 and HO201.

The site is also identified as an area of aboriginal cultural heritage sensitivity and is located within a designated bushfire prone area.

The planning property reports for the site are provided in **Appendix A**.

5.4 Surrounding Land Use

The surrounding land usage to site included the following:

Table 1: Surrounding Land Use

Direction	Description
North	Melba Avenue, Taylor Street and Maroondah Highway are located immediately north of the site. Further north is low to medium density residential housing and Lilydale High School (both approximately 50 m from site). Lilydale West Primary School is located approximately 600 m north of the site. Commercial and light industrial premises associated with the Lilydale town centre are located approximately 400 m to the north and northeast of the site.
East	Swinburne University and commercial/industrial premises (automotive wreckers, electrical supplies) share the northeast boundary of the site. Low density residential housing is located to the immediate east of the site. Further east is Lilydale Lake (approximately 250 m from site) and Olinda Creek (approximately 600 m from site).
South	Stage 1 area comprising vegetated buffer zone and former Mooroolbark Pony Club is located immediately south of the site. Further south is Hull Road and low density residential housing.
West	Mooroolbark Road is located immediately west of the site. Further west is low density residential housing and recreational open space/sporting oval.

As discussed in Section 5.2, a single track railway line and associated 25 m wide rail corridor transects the western portion of the site in a general north-south alignment.

The closest sensitive receptors to the site are considered to include residential properties surrounding the site to the east, south and west; Lilydale High School and Lilydale West Primary School located approximately 50 m and 600 m north of the site respectively; and Lilydale Lake and associated riparian reserve of Olinda Creek located approximately 250 m east from the site.

5.5 Topography, Landforms and Surface Water

The site is located in the foothills of the Mount Dandenong Ranges and varies in elevation from approximately 120-160 metres Australian Height Datum (AHD) (DELWP, www.land.vic.gov.au). The natural topography of the site comprises undulating to steep gradients, particularly along the western portion of the site between the railway line and Mooroolbark Road. Based on historic aerial photographs, these areas appear to be relatively unchanged over time and are likely to represent natural landform features.

Significant alteration to the natural topography has occurred as a result of mining activities particularly in the central and eastern portion of the site. Since its establishment in 1878, the quarry pit has been mined to a depth of approximately 60 m below current surface levels equating to an approximate relative elevation of RL2. Overburden material sourced from the quarry forms an artificial mound in the eastern and south-eastern portions of the site. Buffer mounds utilising overburden material sourced from the quarry have been established around the southern and eastern perimeter of the quarry.

Surface water runoff at the site (external to the quarry pit) is directed into rock-lined culverts or open channels and is diverted into several on-site settling ponds prior to discharge off-site via two (2) licensed discharge points located on the north-eastern and eastern site boundary.

Surface water is present at the site as natural, modified or artificial creeks, dams and sediment collection ponds. The following on-site surface water bodies are understood to comprise:

- A natural surface water course located in the northwest portion of the site, which potentially receives recharge from off-site from the roadside verge along Maroondah Highway. Flow direction within the open water course is expected to be from west to east following the natural steep topography in this area of the site. Overflow from the water course is directed to a small farm dam located on the western side of the railway line. The water course is understood to extend beneath the Lilydale railway line within a concrete conduit, before being diverted via an open earthen channel to the settling ponds located in the north-east portion of the site;
- Two (2) settling ponds located in the northeast portion of the site collect surface drainage water from the site prior to off-site licensed discharge to Lilydale Lake (discharge point DP1);
- A water containment pond/sump is located at the base of the quarry, which collects both groundwater and surface runoff water from the quarry which is subsequently pumped to the on-site drainage system and directed to the abovementioned settling ponds prior to off-site licensed discharge; and
- A natural artesian spring is located beneath the overburden stockpile in the eastern portion of the site. It is understood that the spring is ephemeral in nature and flow is piped to an open rock-lined channel prior to off-site discharge at a licenced discharge point located on the eastern site boundary (discharge point DP2).

The closest off-site surface water receptors comprised:

- A small lake located at Greenslopes Reserve approximately 500 m southwest of the site;
- Lilydale Lake located approximately 250 m east of the site; and
- Olinda Creek located approximately 600 m east of the site.

5.6 Geology

Prensa reviewed the Geological Survey of Victoria *Ringwood* 1:63,360 map (1981, No 849, Zone 7) and other available published documentation. The review identified that the geology of the site consists of a sequence of Devonian-aged sedimentary rocks that are overlain in places by residual outcrops of Tertiary-aged Older Volcanics and sediments. Devonian-aged extrusive volcanics are found to the east of the site. Quaternary aged alluvium occurs in former surface drainage channels around the margins of the site.

The site, and in particular the Cave Hill limestone quarry, lies within the north-northeast trending Lilydale Syncline or trough where the Devonian sediments dip easterly. The Lilydale Syncline and the surrounding geological sequence is shown on cross section B-B1 of the Ringwood 1:63 000 Geology Map sheet. The geological sequence exposed during the quarrying operations consists of, from youngest to oldest:

- *Quaternary Alluvium*: Channel fill and flood plain type deposits;
- *Tertiary Older Volcanics basalt*: Olivine basalt flows with residual basalt boulders and basaltic soils;

- *Tertiary Werribee Formation*: Older Volcanics overlie a thin sequence of sands and clays which contain pieces of silicified wood. The pre-basaltic sediments are assumed to be part of the Werribee Formation.
- *Devonian Cave Hill Sandstone*: The sequence is approximately 60 m thick and consists of laminated sandstone and minor poorly sorted conglomerate, pebbly sandstone and mudstone. The Cave Hill Sandstone is exposed in the eastern face of the Cave Hill quarry and unconformably overlies the Lilydale Limestone.
- *Devonian Lilydale Limestone*: The limestone exposed in the quarry is a lenticular east dipping (60^0 east) body overlying the Humevale Siltstone. The estimated thickness of the limestone is 220 metres with a strike length of approximately 1500 metres. The limestone consists of well bedded pale grey and pink calcarenite (limestone with >50% detrital or transported sand size carbonate grains) and sparry micrite (lime or calcium carbonate mud with crystals of calcite). The limestone is richly fossiliferous in places with corals, brachiopods, bivalves, gastropods and conodonts (Devonian Rocks of Lilydale in Regional Guide to Victorian Geology, 1973).
- *Devonian Humevale Siltstone*: The Humevale Siltstone conformably overlies the Silurian aged Melbourne Formation in the Lilydale area. The dominant lithology is massively bedded siltstone. Where bedding is present the beds are commonly greater than 3m thick (Silurian and Lower Devonian in Engineering Geology of Melbourne, 1992). The lithology is fossiliferous in places with shelly fossils dominated by brachiopods with minor trilobites and corals.
- *Devonian Coldstream Rhyolite*: Part of the Dandenong Ranges Igneous Complex. Consists of a lower flow with evidence of flow banding and an upper flow with rare flow textures and is considered to be a welded ash flow. The Coldstream Rhyolite is not exposed in the quarry but does outcrop on the eastern margin of the site.
- *Silurian Melbourne Formation* (formerly Dargile Formation): The Melbourne Formation forms the bedrock of the greater Melbourne area and consists predominantly of siltstone, minor sandstone and conglomerate. The Melbourne Formation has not been intersected beneath the site. The Melbourne Formation has been identified to the west of the site near Croydon North.

5.7 Hydrogeology

5.7.1 Groundwater Occurrence

The local groundwater flow system at the site is likely to occur within fractured rock and is likely to be unconfined to semi-confined on a local and/or regional scale. In addition, the karstic nature of the limestone formation is likely to result in a myriad of preferential groundwater flow paths. The storage capacity of the local geology is therefore likely to be determined by frequency and interconnection of joints and fractures (Leonard, 1992).

Dewatering is required at the quarry with a sump located on the quarry floor. The groundwater system intersected at the current base of the quarry that requires dewatering (understood to be approximately 2.0-2.5 million litres per day), is likely to be the Lilydale Limestone.

The PESA did not include an intrusive appraisal of the potential contamination status of the local groundwater flow system/s nor the development of a conceptual hydrogeological model for the site. It is understood that Sibelco have undertaken a detailed hydrogeological appraisal for the site, however, this information was not provided to Prensa for review as part of this PESA. A review of the existing hydrogeological data should be incorporated into subsequent environmental assessment works completed for the site.

5.7.2 Regional Groundwater Quality

The Department of Environment and Primary Industries *Melbourne Groundwater Map* (available from www.water.vic.gov.au) was reviewed as part of this PSEA. The map indicates that the uppermost groundwater system in the vicinity of the site is expected to have a salinity range of 1,001 – 3,500 mg/L total dissolved solids (TDS). Groundwater of this salinity would be considered suitable for some domestic irrigation and garden use as well as for livestock, industrial and irrigating salt tolerant crops.

In accordance with the State Environment Protection Policy (Groundwaters of Victoria, 1997, as varied 2002), the salinity range of regional groundwater is consistent with Segment B of the groundwater environment. The beneficial uses of groundwater required to be protected for Segment B include: maintenance of ecosystems; potable mineral water supply; irrigation for agriculture, parks and gardens; stock watering; primary contact recreation; buildings and structures; and industrial water use.

5.7.3 Groundwater Management Area

The site is not located within a Water Supply Protection Area or a Groundwater Management Area. The site does lie within the Olinda Creek Catchment and Olinda Creek Surface Water Management area.

5.7.4 Groundwater Bore Database Search

A search of the groundwater database administered by Federation University (Ballarat) (www.vvg.org.au) was undertaken by Prensa on 3 June 2015 to identify registered groundwater bores at or in the vicinity of the site.

The search indicated the presence of three (3) on-site groundwater bores registered for dewatering or observation purposes. Based on available information provided in the WSP report (2010), the quarry dewatering sump is a registered bore and is likely to be Bore WRK043013. No further information on the two (2) on-site observation bores was available to Prensa.

The database search also identified that there were nine (9) registered groundwater bores located within two (2) km of the site, two (2) of which were registered for groundwater observation use. It is also noted that bore WRK070695, located approximately 2.1 km northeast from the site, was registered for industrial use.

The registered use for the remaining seven (7) bores was unspecified. Prensa notes, however, that two (2) bores (S9037894/1 and S9020796/1) were both located within or in the vicinity of low-density residential properties and there is the potential for these nearby bores to be utilised for domestic and/or irrigation purposes.

Limited information on the lithology and chemical groundwater properties of the off-site groundwater bores was provided in the information reviewed.

The available details for the registered on-site and surrounding off-site groundwater bores are summarised in Table 2 on the following page.

Table 2: Groundwater Bore Search

Bore ID	Installation Date	Easting[1]	Northing[1]	Lithology	Bore Depth	Registered Bore Use	Distance[2] and Direction from Site
WRK043013	No data	353663.2	5818784.1	No data	No data	Dewatering	On-site
WRK052290	01/07/2010	354368.0	5818401.0	No data	42.00 m	Observation	On-site
WRK052286	12/02/2010	354530.0	5818460.0	No data	20.80 m	Observation	On-site
S9030903/1	No data	354518.0	5819565.0	No data	25.00 m	No data	520 m NE
WRK066917	13/06/2012	354207.0	5819888.0	Clay	4.50 m	Observation	500 m NE
WRK066918	13/06/2012	354207.0	5819888.0	No data	13.00 m	Observation	500 m NE
S9036763/1	No data	354477.0	5820063.0	No data	25.00 m	No data	780 m NE
S9037894/1	No data	355805.0	5818589.0	No data	150.00 m	No data[3]	1240 m E
S9036928/1	No data	354855.0	5820598.0	No data	25.00 m	No data	1450 m NE
S9020796/1	No data	356273.2	5818844.1	No data	25.00	No data[3]	1720 m E
S9034834/1	No data	355577.0	5820118.0	No data	25.00 m	No data	1745 m NE
S9028975/1	No data	355277.0	5820652.0	No data	100.00 m	No data	1780 m NE
WRK070695	09/10/2010	355931.0	5820355.0	Top soil, clay, mudstone, shale.	73.00 m	Industrial	2100 m NE

Notes:
[1] Map Grid Australia (MGA) zone 55 easting and northing co-ordinates;
[2] Approximate distance based on VVG data – www.vvg.org.au
[3] Bore indicated to be located within the boundaries of a residential property, therefore potential domestic groundwater uses could be assumed.

5.8 Previous Environmental Site Assessment Reports

A review of the following four (4) previous environmental reports prepared for the southern-most portion of the quarry site (Stage 1) was undertaken by Prensa to gain a preliminary understanding of the historical use and development of the site and to establish potential areas and/or potential sources of contamination at the site resulting from historical and/or current land use activities:

- URS Australia Pty Ltd (2007) *Preliminary Environmental and Geotechnical Site Assessment, Area A – Cavehill Limestone Quarry, Cavehill Road, Lilydale*, prepared for Unimin Australia Pty Ltd, dated May 2007 (URS, 2007);
- WSP Environmental Pty Ltd (2010) *Environmental Site Assessment, Unimin Lilydale, Hull Road, Lilydale*, prepared for Unimin Australia Ltd, dated March 2010 (WSP, 2010);
- Parsons Brinckerhoff Australia Pty Ltd (2010) *Environmental Audit Report, Cavehill Quarry, Hull Road, Lilydale, Victoria (CARMS#65516-1)*, prepared for Unimin Australia Ltd, dated August 2010 (PB, 2010); and
- GHD Pty Ltd (2015) *Environmental Audit, Cavehill Limestone Quarry, Hull road, Lilydale, VIC (CARMS#65516-2,* prepared for Places Victoria, dated 2 April 2015.

A summary of the key findings of the previous report review is provided below. Prensa notes that the aforementioned reports refer to Area A which comprises the Stage 1 area in addition to an area of land in the south western portion of the site adjacent the Lilydale Railway Line.

5.8.1 URS Australia Pty Ltd (2007)

The investigation included a combined preliminary environmental and geotechnical assessment of the southern portion of the quarry site incorporating the existing buffer zone and Pony Club land – referred to as Area A in the URS (2007) report.

The investigation comprised a desktop appraisal of site history documentation, site walkover and interviews with site personnel. No intrusive investigation was undertaken as part of the URS (2007) site assessment works.

URS (2007) made the following conclusions:

- Phosphate and chloride-based pesticides were known to be used in the buffer zone grazing paddocks and Pony Club, and fertilisers were potentially used in the grazing paddocks;
- Petroleum hydrocarbon-based products (i.e. oils and fuels) were stored within the Pony Club maintenance facilities;
- Historical importation of overburden material sourced from the quarry to create the buffer mound in Area A had the potential to contain contaminated soils or materials;
- There was no evidence or records of karst landform features (ie. cavities, caves or slumping) outcropping in the assessment area; and
- No quarrying or landfilling activities (other than the importation of quarry-sourced overburden to create the buffer mound) had historically been undertaken within the assessment area.

5.8.2 WSP Environmental Pty Ltd (2010)

The investigation included a desktop appraisal of available third party data, a visual site inspection, and intrusive soil and groundwater investigation works within the southern portion of the quarry site to support a voluntary section 53X environmental audit. The intrusive investigation included soil sampling from twenty-nine (29) unbiased grid and targeted test pit and hand auger locations, and the advancement of eleven (11) drilled bores to a maximum depth of 24 m below ground level (bgl) to investigate groundwater conditions.

WSP (2010) made the following conclusions:

- The site history appraisal and visual observations of site conditions identified the sources of potential contamination to be associated with the use of various fertilisers, herbicides and pesticides; minor storage and use of petroleum hydrocarbons; septic tank; and the importation of overburden soil material;
- No significant soil contamination was identified at the site at the locations assessed;
- Groundwater was not encountered at the maximum depth of investigation (approximately 24 m bgl) within the assessment area, likely the results of dewatering activities undertaken at the quarry – approximately 2.5 million litres daily of groundwater was reported to be dewatered from the quarry; and
- Groundwater is expected to be located at a depth in excess of 70 m bgl below the assessment area.

5.8.3 Parsons Brinckerhoff Australia Pty Ltd (2010) – Environmental Audit

John Throssell was appointed by Unimin Australia to undertake a voluntary Section 53X environmental audit of the southern portion of the quarry site – then broadly designated by Places Victoria as 'Area A' (currently Stage 1 land). The audit identified that the site had been utilised for grazing purposes from the 1880's and had generally remained vacant and vegetated land with the exception of building infrastructure established in the southwest corner of the audit area between 1981 and 1991 for use as a Pony Club.

Based on the desktop and intrusive assessment works completed by WSP, a Certificate of Environmental Audit was issued for the subject area. At the time of completion of the environmental audit, the condition of the land was identified to be neither detrimental nor potentially detrimental to any beneficial use of the site.

The Certificate of Environmental Audit also identified that a septic tank servicing the Pony Club amenities was present on-site at the time of completion of the environmental audit.

5.8.4 GHD Pty Ltd (2015) – Environmental Audit

John Throssell was appointed by Places Victoria to undertake a voluntary Section 53X environmental audit for land located at the northern tip of Stage 1 area. The audit focused on land included within Stage 1 that was not originally included within the 2010 Environmental Audit.

A Certificate of Environmental Audit was issued for the subject area.

6 Site History Review

6.1 Existing Proprietor

The current land title documentation for the site was made available to Prensa by Sibelco. Review of the certificates of title indicates that current registered proprietor of the site is David Mitchell (Victoria) Pty Ltd. The site comprises seven (7) lots described as follows:

- Lots 1, 2 and 3 on Title Plan 810358 on Volume 8245 and Folio 536 (4 Melba Avenue);
- Lot 2 on Plan of Subdivision 325111 on Volume 8756 and Folio 801 (4 Melba Avenue); and
- Part of Lots 1, 2 and 3 on Title Plan 242712 on Volume 8245 and Folio 535 (451-453 Hull Road) (less Stage 1 area).

Copies of the certificates of title are provided as **Appendix B** of this report.

6.2 Historical Title Information

A review of the historic title documentation as provided in the previous URS (2007) and WSP (2010) reports was undertaken by Prensa.

The historic title review indicates that the site has been largely owned by David Mitchell (Victoria) Pty Ltd (2002-present) and various entities and trustees of the Mitchell family including David Mitchell Estate Limited (1958-2002), Edward Leslie Newbigin and The Trustees Executors and Agency Company (1928-1958), Edward Leslie Newbigin and William Henry Ernest Mitchell (1925-1928), Edward Leslie Newbigin (1923-1925), and David Mitchell (1880-1923).

It is also understood that David Mitchell purchased the Cave Hill farm in 1878 from a William Nicholson, however, the original certificate of title documentation was not included in the previous assessment reports reviewed.

6.3 Aerial Photographs

Aerial photographs dating between 1952 and 2010 were reviewed as part of the site history review component of this PESA. Copies of the historical aerial photographs reviewed are provided in **Appendix C** of this report.

A summary of the aerial photograph review is provided in Table 3 below.

Table 3: Aerial Photographs

Date	On Site Observations	Off Site Observations
1952	Only the northern portion of the site was visible within the photograph. Vacant fields were located along the northern and western boundaries with the exception of a small building on Maroondah Highway and what appeared to be a small creek running on a north-south course. The Lilydale railway line was evident running in a general north-south alignment through the site; the quarry pit itself being located to the immediate east of the railway line. The former Mt Evelyn railway or tramline was evident in the eastern portion of the site and terminating at the processing plant. The quarry was accessed from the north with two roadways leading into the quarry. The north western section of the site appeared to be the processing and transport area; it consisted of several buildings (presumably for processing limestone), the main road and a railway siding. South of the processing area was the open cut quarry; the quarry has been cut into the ground to some depth judging by the winding nature of the entrance roadway. A large area east of the open cut appeared hilly in nature and may be the storage area of the overburden. In the north eastern portion of the site, several smaller buildings are evident, likely associate with the former Cave Hill Farm.	Very little of the offsite area can be seen, however directly north of the site was a residential area.
1956	The entire site can be seen in the 1956 image. The quarry and associated facilities were located in the centre of the site. The land surrounding this area appeared undeveloped and vacant though appears to be generally undulating. The railway line travelled the entire length of the site; it enters at the northern boundary and exists in the south western corner. Little change appeared to have occurred to the quarry between 1952 and 1956, though the overburden stockpiles are more clearly defined on the eastern edge of the facility.	Lilydale township was located to the north of the site. The town primarily consisted of small residential allotments with the railway station and main commercial street being located north east of the site. The land to the west, south and east of the Site appears to be vacant, undeveloped farmland. Land directly east of the site appears to be part of the Olinda Creek flood plain.
1960	The open cut quarry appeared 'deeper' in 1960 than it did during 1956. A new roadway had been built to access the quarry floor and is located in the northern corner. Additional overburden appeared to have been added to stockpiles east of the quarry processing area and south east of the open cut.	A school had been built directly north of the site while minor residential and commercial development had occurred to the north and west of the site.

Table 3: Aerial Photographs

Date	On Site Observations	Off Site Observations
1972	The open cut quarry was clearly defined by shadow and was at least four levels deep (two (2) former quarry floors in addition to the current floor). Access to the open cut appeared to be from the west and a newly constructed building and conveyor system located in the north western corner of the open cut potentially transported raw material to the processing plant area. The railway siding was still in use as wagons can be seen in the siding. A small dam was excavated to the north east of the quarry facility; several small buildings were removed to accommodate this. Recent overburden additions are clearly discernible as 'white' areas to the east of the quarry facility. The eastern, western and southern portions of the site appear to remain grazing paddocks.	Further commercial development had occurred along the north eastern boundary of the site. Further east, the land appears to be generally grazing and a tributary of Olinda Creek is evident.
1974	An area to the south of the quarry appeared to be cultivated as distinct patterns could be seen on the landscape; this pattern extended offsite into the surrounding fields. The overburden piles had increased in size from the 1972 image. West of the small dam was an area that appeared to be under development; a distinct circular shape is noted in the northern area of the site (which has not been investigated further).	The cultivated land pattern noted onsite, extends for a short distance offsite to the south west. No development had occurred directly east of the site.
1981	The area which was identified in the 1974 image as being cultivated was still distinct in the 1981 image; horizontal lines (east to west) indicative of ploughing can be observed. The open cut quarry appeared to be deeper and the south eastern corner had been extended slightly to the east. This had resulted in the directly adjacent overburden pile being moved further east. The conveyor belt previously located on the western wall had been removed and replaced by a series of winding roads into the open cut. Several buildings to the north east of the facility had been removed.	Residential development to the south west of the site had occurred, a likely extension of the neighbouring suburb of Mooroolbark. Further residential development was evident to the north to the north west of the site. Additional commercial properties had been constructed to the north east of the site.
1991	The open cut quarry was in the process of being extended to the east. A large area was in the process of being excavated in the area formally occupied by overburden. Very little detail can be distinguished in the area occupied by the processing and administrative buildings.	The land to the west and south of the site was almost totally developed for residential use; only a small area close to the south west corner and immediately south of the site remained undeveloped. A small structure was under construction close to the south western boundary of the site. An additional residential development was under construction to the south east of the site. East of the site, Lilydale Lake had been constructed.

Table 3: Aerial Photographs

Date	On Site Observations	Off Site Observations
2004	The extensive depth of the open cut quarry was clearly discernible (i.e. at least eight bench levels noted). Limestone quarrying along the eastern portion of the Site; several established roads can be observed in the area. A newly constructed, large warehouse-type structure was located to the north eastern portion of the site.	Swinburne University (Lilydale Campus) had been constructed to the east of the Site. Residential development to the south east established. A newly constructed shed has also been erected in the area adjacent the south western boundary of the site.
2010	Little change to the 2004 image.	Little change to the 2004 image.

6.4 State Library of Victoria / National Library of Australia Records

A general on-line search of the State Library of Victoria and National Library of Australia and other available published historical documents was undertaken by Prensa. The search confirmed the following information regarding historical land use activities undertaken at the site:

- The Cave Hill Cheese and Butter Factory was established at the site in 1892 (The Argus, 1893);
- An explosives magazine was located on the site and explosives were used for mine blasting (Barrier Miner, 1948). The actual location of the former explosives magazine was not known to Sibelco personnel.
- The Cave Hill and Mount Evelyn tramway was built to convey firewood for use as fuel within the lime kilns (The Argus, 1945). The Cave Hill branch line from the main Warburton Railway Line is depicted in the 1945 article as being removed or closed.

Copies of the historical published documentation reviewed as part of this PESA is provided as **Appendix D** to this report.

6.5 Melbourne Metropolitan Board of Works

A review of the Melbourne and North Melbourne MMBW Detailed Plans indicated that the site is not located within the bounds of this map series.

6.6 Dangerous Goods and Hazardous Materials Database

Prensa submitted an enquiry to WorkSafe Victoria to undertake a search of the Dangerous Goods Database. As of 27 August 2013, there were no records of Dangerous Goods Storage and Handling registered for the site address.

A copy of the WorkSafe Victoria search statement is provided as **Appendix E** to this report.

6.7 Utilities and Drainage Plans

Prensa obtained available subsurface utility and drainage plans from Dial Before You Dig. Review of available plans at the time of completion of this report identified the following utilities are present on the site:

Table 4: On-Site Utilities and Services

Utility / Service	Asset Holder	Location
Sewer	Yarra Valley Water	North west corner of site on western side of Railway Line. Extends north and off-site to the south side of Melba Avenue.
Water	Yarra Valley Water	No information for on-site. Surrounding off-site areas are connected to mains water.
Drainage	Melbourne Water	No information for on-site. Off-site drainage pipeline from on-site settling pond discharge point is indicated.
Gas	Multinet Gas	North west corner of site on western side of Railway Line. Extends north to north side of Melba Avenue.
Electricity	SP Ausnet	Northwest corner of site (overhead lines).
Telecommunications	VicTrack	No VicTrack assets on-site, limited to rail corridor.

6.8 EPA Priority Sites Register

A search of the EPA Priority Sites Register was undertaken for the site on 3 June 2015. The Register indicated that the site was not listed on and was not in the vicinity of an EPA Priority Site at the time of this assessment.

The nearest EPA Priority Site in proximity to the subject site was located approximately 5.2 km to the north-east and was listed as a former landfill located at Ingram Road, Coldstream requiring ongoing management.

It should be noted that the Priority Sites Register does not list all sites known to be contaminated in Victoria, and a site should not be presumed to be free of contamination if it does not appear on the Priority Sites Register.

6.9 Review of Environmental Audit Reports for Surrounding Sites

A search of the EPA Victoria List of Issued Certificates and Statements of Environmental Audit was undertaken on 3 June 2015.

The search identified that, with the exception of the previous statutory environmental audit completed for a portion of the subject site in 2010 and 2015 (refer to Section 5.8), there were no other properties within 1 km of the site for which a certificate or statement of environmental audit had been issued.

The nearest audit site for which a certificate or statement of environmental audit had been completed was located approximately 5 km from the subject site.

7 Site Inspection

A limited site inspection was conducted by Christie Batiste and Nick Owen of Prensa on 28 August 2013. The site contact at the time of inspection was George Glab and Graeme Woodruff, both employees of Sibelco.

The inspection comprised a walkover of on-site areas limited to the Engineering Building, the main office and plant area, the two (2) licenced water discharge points, and the settling pond in the north-east portion of the site to identify existing or historical on-site activities that had the potential to cause contamination to land, surface water and/or groundwater. Visual observations of the broader quarry site were made during a 'drive around' the internal perimeter site boundary

Access to the entire site was not made during the site walkover due to health and safety protocols and photographic records of site conditions were not permitted on the basis of sensitive information.

During the site inspection, anecdotal information on the historical development of the quarry site and the current activities undertaken at site was provided by George Glab and Graeme Woodruff.

For the purposes of this assessment, the site has been broadly categorised into six (6) areas; namely Area A to Area F as shown in **Figure 2**.

A summary of the on-site observations and anecdotal information provided by Sibelco staff is provided in the following sections.

7.1 Area A – Pony Club and Buffer Zone (Stage 1 Land)

The 'Area A' or Stage 1 land located immediately south of the site has been the subject of previous environmental assessments and environmental audits (refer to Section 5.8).

Prensa notes that the Mooroolbark Pony Club no longer operates within the Stage 1 area.

In December 2014, a planning permit was issued to allow the Stage 1 land to be subdivided and developed for residential purposes.

7.2 Area B – Main Plant and Offices

The main processing plant was located in the northern portion of the site and comprised historical buildings dating to the late 1800's and more recent office and maintenance buildings. The following infrastructure was observed in Area B:

- Engineering building: former cheese factory currently utilised as Sibelco offices. The former bacon and ham curing factory building was located adjacent to the Engineering Building;
- Former caretaker's residence: a timber residential dwelling dating to approximately 1970's. There is the potential for a septic tank system associated with the residence;
- Office buildings and weighbridge;
- Maintenance building: a metal fabricated shed with concrete slab used for bulk storage of fuel oils including (but not limited to) waste oil, hydraulic oil, engine oil, transmission fluid and coolant. The products were observed to be stored in 200 litre drums (approximately 50) and 20 litre plastic containers (approximately 50). Three (3) aboveground storage tanks were contained in a concrete bunded area for the storage of waste oil (approximately 10K litre steel tank) and hydraulic oil (2 x approximately 5K litre rectangular steel tanks). No obvious staining or evidence of spills was observed in the vicinity of the maintenance building;

- Fuel storage: one (1) 65K litre diesel aboveground storage tank and one (1) bowser dispenser located on concrete pad was located to the south of the maintenance building. It is understood that the diesel tank was installed around 2012. No obvious evidence of spillage or leaks from the tank or bowser was observed. Sibelco were not aware of any significant historical spills or leaks associated with the storage and handling of petroleum fuels on the site;
- Previous fuel storage: an unknown number of underground storage tanks, potentially used for diesel and petrol storage, were removed in the 1990's from an area adjoining the northern rim of the quarry to facilitate redevelopment of processing plant within that area of the site. A dangerous goods sign indicating "PETROL" remains in the general vicinity of the former underground storage tanks. Potentially contaminated soil sourced from the underground storage tank excavation area was relocated to a bunded area located on the eastern rim of the quarry pit. Two (2) disused aboveground storage tanks for potential storage of oil historically used to fire the lime kilns were located in the western portion of the main plant area. The steel tanks (each approximately 50K litres capacity) were housed on concrete footings and appeared to be in relatively sound condition with no obvious staining of the surrounding surface was observed. The age of the tanks is unknown. Sibelco personnel indicated there was the potential for residential product to remain within the tank infrastructure, however, this was not confirmed during the site inspection;
- Triple interceptor pit: this structure was not observed during the site inspection and the location is not reported;
- Lime kilns: four (4) lime kilns currently powered by natural gas are located in the processing plant to manufacture lime products from the raw limestone material sourced from the site. Historically the kilns were fired using timber, coal (briquettes) (Healesville and Yarra Glen Guardian, 1932) and later oil. It is understood that there is currently no by-product produced from the lime-burning process, with the exception of water as steam which is emitted to air. There is the potential that historical lime-burning processes produced waste by-products (i.e. coke, slag) from the firing of timber and coal;
- Substations: two (2) substations were observed to be located in the main processing plant area. No access to the substations was made during the site inspection; and
- Truck wash: a concrete truck wash bay was located to the south of the main office buildings. The wash bay utilises dewatering water from the quarry pit. No obvious detergents were observed in the truck wash and it is understood that waste water is diverted to the on-site settling pond.

7.3 Area C – Quarry Pit

The quarry pit is located in the central portion of the site. Access to the quarry was not achieved during the site inspection.

Based on observations and anecdotal information provided by Sibelo, the following is understood regarding the operating activities undertaken in the quarry pit:

- It is understood that dewatering from the quarry base occurs via a sump, which pumps approximately 2.0 to 2.5 million litres of groundwater daily from the pit. It is further understood that the 'pit water' is piped from the quarry base to holding tanks located in the main processing plant area and is utilised on-site for dust suppression, recycled water for truck wash area, and potentially other on-site industrial uses. The balance of the 'pit water' is piped to the settling pond located in the northeast portion of the site prior to off-site licenced discharge;

- A crushing plant is located on the northwest rim of the quarry which receives raw material from the quarry. No access to the crushing plant was made during the site inspection;
- The hard rock mining process within the quarry is performed via blasting using explosives. Historical records also indicate that blasting activities and use of explosives was undertaken in the early 1900's and potentially earlier; and
- Mobile plant machinery (i.e. excavators) operating within the quarry pit was observed. The former mobile plant and transport activities historically undertaken in the quarry pit was not identified by Prensa as part of this assessment.

7.4 Area D – Settling Pond

The settling pond located in the northeast portion of the site receives 'pit water', waste water (for example, but not limited to, runoff from vehicle wash-down activities) and stormwater (being sourced from both on-site collection, and/or off-site up-topographic gradient source/s – such as from adjacent roadways) from the site prior to discharge off-site.

The discharge point (DP1) was observed to comprise an open concrete-lined culvert, and water flow being monitored via a V-notch weir and in-situ data-logger. It is understood that weekly monitoring of the discharge water leaving the site is performed by Sibelco, however, this information was not made available to Prensa as part of the PESA.

It is understood that the discharge water leaving the site is piped beneath the off-site industrial park before it enters a natural watercourse/creek (tributary to Olinda Creek) and discharges to Olinda Creek.

Based on information provided by Sibelco, it is understood that sediment within the settling ponds is dredged (approximately biannually) and solid dried and relocated to the overburden stockpile. An inspection of the overburden stockpile did not form a component of site walkover undertaken by Prensa as part of the PESA.

A historic timber farm shed and potential limestone coolstore is located to the west of the settling pond. These buildings were likely associated with the former Cave Hill Farm operations which historically extended through this northern area of the site. A detailed inspection of the shed and silage store was not undertaken by Prensa as part of the PESA.

7.5 Area E – Overburden Stockpile and General Stockpile Area

Works to relocate the overburden stockpile to its current position commenced in 1989. Prior to this date, the quarry overburden is understood to have been located closer to the eastern rim of the quarry pit.

Based on anecdotal information provided by Sibelco, the following is understood regarding the overburden / material stockpile areas:

- The overburden stockpile currently comprises approximately 10 million cubic metres of soil material. A detailed appraisal of this material did not form part of the PESA;
- A rock-lined drainage channel exists around the southern, eastern and northern perimeter of the overburden stockpile which collects surface water and 'spring' water runoff for ultimate discharge off-site (refer below);
- Lime manufactured on-site was observed to be stored within a large metal fabricated shed ("Ag-Lime Shed") located to the north of the overburden stockpile. The shed was observed to comprise concrete hardstand floor;

- Sprinklers were observed to be present in the vicinity of the Ag-Lime Shed for dust suppression purposes;
- A bunded soil "remediation area" is understood to be located with the general overburden and stockpile area. For example, it is understood that material previously removed from former underground storage tank excavation works (refer to Section 7.2), and potentially other areas of the site, have been placed within this general overburden and stockpile area;
- Sediment sourced from the settling ponds located in the northeast portion of the site is understood to be relocated to the overburden stockpile (refer to Section 7.4); and
- As discussed in Section 5.5, a natural artesian spring is located beneath the overburden stockpile. Water flow from the spring is collected, pumped and piped to the rock-lined drainage channel located on the eastern perimeter of the overburden dump prior to off-site discharge at the licensed discharge point (DP2) located on the eastern site boundary. The discharge point was observed to comprise an open concrete lined culvert, and water flow was monitored via a V-notch weir and in-situ data-logger (similar to DP1). It is understood that the discharge water leaving the site is piped beneath the off-site residential premises before it enters an open drainage channel and is understood to discharge to a wetland area and subsequently into Lilydale Lake. It is further understood that weekly monitoring of the discharge water leaving the site is performed by Sibelco, however, this information was not made available to Prensa as part of the PESA.

7.6 Area F – Grazing Paddocks (incorporating 'cricket ground')

The area west of the Lilydale Railway line was observed to comprise vacant grassed paddocks. For the purposes of the PESA, the northern-most portion of the site (open grassed areas and horse agistment/grazing paddock) has been incorporated into Area F. Other than one (1) building (former recreation/sports pavilion), no significant building infrastructure was observed to be present in this area of the site. Historically, it is understood that buildings associated with the former Cave Hill Farm existed in this general area.

Sibelco are currently responsible for the grounds maintenance of the grazing paddocks and there is the potential for weed spraying to be performed in this area of the site.

8 Potential Areas of Concern & Contaminants of Potential Concern

Based on a visual inspection and review of available historical information pertaining to the site and immediate surrounding properties, the potential on-site and off-site sources of contamination and typical (but not limited to) associated contaminants of concern are provided in the table below.

Table 5: Potential Areas and Contaminants of Concern

Relative Location	Potential Contaminant Source/s	Typical Potential Contaminants of Concern
Area B – Main Plant & Offices	Building infrastructure – paints, hazardous materials	Various metals, polychlorinated biphenyls, asbestos.
	Potential septic tank system/s	Nitrates, bacteria (such as *E.coli).*
	Maintenance workshop facilities – fuel and oil storage & handling	Petroleum hydrocarbons (TPH, BTEX), lead, chlorinated hydrocarbons (VOCs and SVOCs), oils and greases.
	Existing aboveground diesel fuel storage tank, bowser dispenser & refuelling activities	Petroleum hydrocarbons (TPH, BTEX, MAH, PAH), naphthalene.
	Inadvertent minor spills and leaks from plant machinery	Petroleum hydrocarbons (TPH, BTEX), lead, chlorinated hydrocarbons (VOCs and SVOCs), oils and greases.
	Redundant aboveground fuel oil storage tanks; Former underground diesel/petroleum storage tanks	Petroleum hydrocarbons (TPH, BTEX, MAH, PAH), lead, phenolic compounds, naphthalene.
	Lime kilns (current)	Calcium carbonate, calcium bicarbonate, pH.
	Lime kilns (historical) – timber, coal & oil fuel source	Petroleum hydrocarbons (TPH, BTEX), PAHs (coke, slag, ash and charcoal).
	Substations	TPH, PCBs, oils, phenolic compounds.
	Historical railway siding / Mt Evelyn Tramway	Chromium-copper-arsenate (CCA) preservatives, pesticides including but not limited to OCPs, OPPs, herbicides and weedicides, phenols, pentachlorophenols, petroleum hydrocarbons, oils, solvents, asbestos.
	Historical butter factory / bacon curing factory / potential piggery	Various, may include metals, nitrate, OCPs, general anions and cations, pH, PAHs, oils, coke/slag/ash.
	Historical farming	Nitrates, metals, fertilisers, pesticides (OCPs and OPPs), herbicides.
Area C – Quarry Pit	Extractive mining / quarrying	Metals, explosives (may include nitrate, ammonium, nitro-glycerine).
	Groundwater	Various.
	Inadvertent minor spills and leaks from plant machinery	Petroleum hydrocarbons (TPH, BTEX), lead, chlorinated hydrocarbons (VOCs and SVOCs), oils and greases.
	Crushing plant	Petroleum hydrocarbons.
Area D – Settling	Groundwater, waste water, stormwater	Total dissolved solids (TDS), general anions

Table 5: Potential Areas and Contaminants of Concern

Relative Location	Potential Contaminant Source/s	Typical Potential Contaminants of Concern
Pond		and cations, pH.
	Sediment / sludge	Total dissolved solids (TDS), general anions and cations, pH.
Area E – Overburden Stockpile & General Stockpile Area	Natural quarry sourced material	Various metals, pH.
	Ag-lime, quick lime	pH, calcium carbonate, calcium bicarbonate.
	Potential historical deposition of unknown materials	Various.
	Dust suppression watering – quarry sourced groundwater / stormwater	Total dissolved solids (TDS), general anions and cations, pH.
Area F – Grazing Paddocks (incorporating 'Cricket Ground')	Grazing paddocks	Pesticides including but not limited to OCPs, OPPs, herbicides and weedicides; nitrates, ammonia, bacteria (such as *E.coli*).
	Septic tank system/s	Nitrates, bacteria (such as *E.coli).*
	Building infrastructure & maintenance facilities – paints, hazardous materials	Various metals, polychlorinated biphenyls (PCBs), petroleum hydrocarbons (TPH, BTEX), oils and grease, asbestos.
	Surface water received from off-site	Various metals, petroleum hydrocarbons, nitrate.
Off-Site (uncontrolled sources)	Lilydale Railway Line	CCA preservatives, pesticides including but not limited to OCPs, OPPs, herbicides and weedicides, phenols, pentachlorophenols, petroleum hydrocarbons, oils, solvents, asbestos.
	Industrial premises (automotive wrecker)	Metals, TPH, BTEX, solvents.
	Nearby roadways	Various, including metals, petroleum hydrocarbons.
	Surface waters (entering site)	Various, including metals, petroleum hydrocarbons, oils, nitrates, fertilisers.
	Residential properties	Herbicides, weedicides, pesticides, fill importation, incinerator waste, paints, solvents.
	Pony Club – septic tank system	Nitrates, bacteria (such as *E.coli*)
	Pony Club – building infrastructure and maintenance facilities	Various metals, PCBs, TPH, BTEX, oils and grease, asbestos

Notes: TPH – total petroleum hydrocarbons; BTEX – benzene, toluene, ethyl benzene, xylenes; PAH – polycyclic aromatic hydrocarbons; MAH – monocyclic aromatic hydrocarbons; PCBs – polychlorinated biphenyls; CCA – chromated copper arsenate; VOCs – volatile organic compounds; SVOCs – semi-volatile organic compounds; OCP – organochlorine pesticides; OPP – organophosphorous pesticides; TDS – total dissolved solids.

9 Conclusions and Recommendations

Prensa was engaged by Places Victoria on behalf of Sibelco to conduct a PESA of the Lilydale Quarry located at Melba Avenue, Lilydale (the site).

The objective of the PESA was to provide an indication of the potential for contamination and/or sources of contamination to be present at the site as a result of current and/or historical land use activities. The PESA will also assist in the preparation of a Development Plan and will support a Planning Scheme Amendment for the rezoning of the site to a Comprehensive Development Zone.

Based on a review of site history resources, it is understood that the site has been utilised for extractive quarrying and farming activities for over 130 years.

The site is situated in a generally residential and commercial precinct. The Lilydale Railway Line runs in a general north-south alignment through the site.

Sensitive receptors in the vicinity of the site are considered to include adjoining residential properties and schools, and nearby surface waters including Olinda Creek and Lilydale Lake. There is also the potential for groundwater in the vicinity of the site to be abstracted for domestic purposes.

From the available site history records reviewed and a limited site inspection undertaken by Prensa, potential contamination sources associated with current and/or historical land uses were identified to be present at the site.

The nature of the potential contamination is not considered likely to preclude the site from being redeveloped for more sensitive land uses.

A more detailed environmental site assessment may be required to evaluate the condition of the land (i.e. soil, surface water and groundwater) prior to any future proposed land use.

It is also recognised that any planning scheme amendment to rezone the land to allow sensitive uses will need to consider relevant Environmental Audit Overlay (EAO) requirements. This may include the need to obtain a Certificate or Statement of Environmental Audit in accordance with the *Environment Protection Act 1970* prior to the commencement of development works associated with sensitive land use, such as residential.

9.1 Opportunities and Constraints

The PESA identified that the subject site provides opportunities for future redevelopment. Notwithstanding current operations undertaken at the site, there is the potential that future site remediation and rehabilitation could support future development.

There is the opportunity that future proposed development of the site could be effectively rehabilitated to support sensitive land uses, however, it is likely that certain areas of the site would require a higher degree of environmental assessment and/or remediation to support sensitive uses.

A summary of the opportunities and constraints for the developable potential for the site as a result of the currently known condition of the site is detailed in the table on the following page:

Table 6: Potential Opportunities and Constraints

Area	Potential Constraint	Potential Opportunity
Area B – Main Plant & Offices	• Time constraint: Requires plant cessation, decommissioning and land forming of final levels for the proposed end use, recommended prior to assessment of this area. • Process constraint: Change in land use to a 'sensitive' use likely to trigger a Statutory Environmental Audit.	• Based on available historical information and current site walkover, appears to be a limited quantity of imported potential contaminants within selected areas. As such these areas could be individually readily assessed in the short term, subject to cessation of current activities.
Area C – Quarry Pit	• Time constraint: Material ear-marked for placement in quarry pit would require appropriate assessment to establish the potential contamination status. • Process constraint: Change in land use to a 'sensitive' use likely to trigger a Statutory Environmental Audit.	• Based on available historical information, the composition of the overburden and stockpile material is unlikely to realise in significant contamination to the land surface environment. Predominantly understood to comprise natural material sourced from the onsite quarry. • Potential for this area to be redeveloped for various beneficial end uses – excluding any geotechnical and/or civil constraints.
Area D – Settling Pond	• Time constraint: Ongoing surface water treatment and monitoring during operational phase and decommissioning phase. • Removal of pond sludge. • Potentially impacted with alkaline sediments and other unknown potential contaminants at this stage. • Process constraint: Change in land use to a 'sensitive' use likely to trigger a Statutory Environmental Audit.	• Potential for this area to be redeveloped in to a wetland system or public facility amenable to existing offsite creek and lake systems.
Area E – Overburden Stockpile & General Stockpile Area	• Potential for unknown historical contaminant deposition within stockpile (i.e. at depth). • Time constraint: Final land surface only amenable to be assessed following removal of overburden and stockpile material. • Process constraint: Change in land use to a 'sensitive' use likely to trigger a Statutory Environmental Audit.	• Based on available historical information, the composition of the overburden and stockpile material is unlikely to realise in significant contamination to the land surface environment. Predominantly understood to comprise natural material sourced from the onsite quarry. • Potential for the natural 'artesian' spring to form part of a future land surface feature.

Table 6: Potential Opportunities and Constraints

Area	Potential Constraint	Potential Opportunity
Area F – Grazing Paddocks (incorporating 'Cricket Ground')	• Potentially impacted with contaminants such as, but not limited to, pesticides, weedicides, herbicides, nitrates and bacteria. • Process constraint: Change in land use to a 'sensitive' use likely to trigger a Statutory Environmental Audit.	• Area readily accessible to be assessed in current status. • There is the potential that this area may be conditionally suitable for sensitive land use redevelopment.

In summary, the abovementioned discussion of potential opportunities and constraints is somewhat dependent upon the timing of cessation and decommissioning of infrastructure at the site.

In light of the nature of the historical and current activities undertaken at the site, whilst selected areas may require targeted remedial effort, the potential for significant and extensive land surface impacts is, at this stage, considered unlikely.