



# Detailed Site Investigation, 65-73 Dunheved Circuit, St Marys



Borg Manufacturing Pty Ltd

**FINAL**

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DRC DSI 65 Dunheved Crt 110219

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## EXECUTIVE SUMMARY

DRC Environmental Pty Ltd (DRC) was engaged by Borg Manufacturing Pty Ltd (Borg) to undertake a Detailed Site Investigation (DSI) works at 65-73 Dunheved Circuit, St Marys, New South Wales (the site). The site is currently in the process of re-development planning for industrial use.

DRC undertook a preliminary site investigation (PSI), review of previous reports (accessed at the City of Penrith Council and excavated 19 test pits across accessible areas of the site.

The site is currently used for industrial use and has four tenants operating separate businesses on the site. Site uses include:

- Dutch Rembrandt Clubhouse including restaurant;
- ANTQIP civil contractors and plant hire with workshop, diesel above ground storage tank (AST) and parking for plant equipment;
- Ventia (limited access) – contractor storage yard; and
- Jaybro concrete barrier fabrication and storage of products for the construction industry;

Previous tenants RCA Trucks, truck parking area, site hut and diesel AST and Superior Sandstone Supplies which crush sandstone into sand products were no longer observed at the site in 2018.

The site history review completed for the site, reported the following potential causes of contamination onsite have been noted:

- Uncontrolled Fill and Fill Quality – Derived from backfilling of the western portion of site with uncontrolled fill; and
- Inert waste items – Aesthetic impacts from inert waste within fill material

Potential offsite sources of contamination were not identified during the site history review. It is noted that an industrial area exists in the vicinity of the site (Dunheved Industrial Park).

During a site walkover in 2016 staining was noted on the ground behind the ANTQIP warehouse, together with an oily residue pooled on the ground surface on the western edge of the warehouse building. The pooled oil residue was not observed in 2018.

Test pits excavated by DRC reported fill material ranged from the surface to a thickness of 0.35 m bgl in the eastern portion of the site to over a thickness of 3.8 m in the western portion of the site. Natural soils were only encountered at locations on the eastern portion of the site.

Soil analytical results reported benzo(a)pyrene, TRH C<sub>16</sub>-C<sub>34</sub> and F2-naphthalene above the NEPM ESL guideline. Although the reported at concentrations that may exceed NEPM ESL, analysis of the site soils reported an arithmetic mean below the ESL guideline TRH C<sub>16</sub>-C<sub>34</sub> and F2-naphthalene. Benzo(a)pyrene 95% UCL results were slightly above the ESL guideline, but benzeo(a)pyrene TEQ results were below NEPM HIL D guidelines.

Free fibre asbestos was not identified within the shallow fill material at the site and no substantial quantities, burial zones of intensive concentrations of ACM debris or potential ACM debris were identified by this site assessment.

The outcomes of the investigation indicate that the site:

- Has been subjected to a history of industrial or commercial activities and site filling that may have a potential to contaminate land;
- Has been filled with soils that have been chemically tested by a professional environmental consulting firm to be compatible with commercial/industrial land use;

- Is not filled with soils that are of an unsuitable aesthetic quality for commercial/industrial land use as demonstrated by the current and historical intensive excavation works completed for the site;
- Has been visually inspected and validated for asbestos impacts with further analytical results reporting that no free asbestos fibres were detected. Any asbestos found during future site development is likely to be limited to isolated amounts of bonded ACM (cement sheeting) at the surface of the site or within the fill material;
- Soil results reported concentrations of benzo(a)pyrene above ESLs within fill material;
- All soil analytical results were reported to be below HIL D and HSL D and are not considered to pose a risk to future commercial/industrial users at the site;
- No waste stockpiles were noted across the subject property and there was no evidence of waste or transfer station use at the site;
- Remedial works required to remove oil stained soils and soils in the vicinity of SS01 and TPO6 are envisaged to be minor in nature and would be achievable using standard equipment without a significant cost ramification; and
- Is in a current condition that, in DRC's opinion, is suitable for industrial land use and sub-division as an industrial estate with minor levels of post tenancy clean up required.

DRC note that based on correspondence from EPA NSW dated 13 February 2018, supplied as **Appendix I** to this DSI report, EPA does not intend on pursuing further regulatory action in relation to Clean-up Notice No.1540293.

# 1 INTRODUCTION

DRC Environmental Pty Ltd (DRC) was engaged by DDDS Pty Ltd and Borg Group Pty Ltd (Borg) to undertake a Detailed Site Investigation (DSI) works at 65-73 Dunheved Circuit, St Marys, New South Wales (the site). The site is currently in the process of re-development planning for industrial use. Borg proposes to development the site with a large warehouse (approximately 16,950m<sup>2</sup>) and associated parking and office space.

The site location is presented on **Figure 1**. The site is an industrial property and currently has four lease holders. These lease holders included the following:

- Dutch Rembrandt Club- headquarters for the club;
- ANTQIP – Earthworks contractors with workshop, plant wash down, storage, a diesel above ground storage tank (AST) and parking;
- Ventia – construction services storage yard; and
- Jaybro – concrete barrier fabricators and storage for steel products and geofabrics, a small diesel above ground storage tank (AST) was also present at the rear of the site.

Previous tenants RCA Trucks, truck parking area, site hut and diesel AST and Superior Sandstone Supplies which crush sandstone into sand products were no longer observed at the site in 2018. Their portions of the site were being used by Jaybro for further storage of scaffolds, temporary fencing and geofabrics.

Historical environmental assessment works have previously been undertaken at the site by Golder & Associates (Golder) and Compaction & Soil Testing Services Pty Ltd (CSTS). For further detail, please refer directly to the CSTS reports provided in **Appendix B**. Golder reports were only available for review, a summary of Golder reports are provided in the Site History Review section.

The site had also been issued an EPA Clean up Notice (No.1540293, 21 June 2016) to clean up ‘waste’ previously noted at the site. DRC note that based on correspondence from EPA NSW dated 13 February 2018, supplied as **Appendix I** to this DSI report, EPA does not intend on pursuing further regulatory action in relation to Clean-up Notice No.1540293.

## 1.1 Purpose and Objectives

It is understood by DRC that the site is to be redeveloped as an industrial estate and this detailed soil investigation was undertaken to identify potential soil contamination present at the site that may inhibit land development activities for ongoing industrial use. Additionally, a site walkover was to be undertaken to assess if ‘waste’ identified by the EPA in 2016 had been removed.

## 1.2 Scope of Works

The works undertaken at the site are summarized as follows:

- Preliminary site investigation;
- Reviewing of previous environmental reports (accessed at City of Penrith Council);
- Test pitting at 19 locations; and
- Reinstatement and track rolling of soils at all locations.

The scope of works for the site was limited due to accessibility constraints to the Rembrandt Club and Ventia’s leased sites, additionally due to large storm events, access was not available to a portion of the Superior Sandstone Supplies lease. The site assessment was therefore amended to gain a reasonable appraisal across the majority of the land area noting also that the Rembrandt Club portion of the site was deemed to be low risk given its history of land use.

This assessment has been undertaken in general accordance with the New South Wales Government (2018), State Environmental Planning Policy (SEPP) No. 55 – Remediation of Land.

## 2 SITE DETAILS

The site is located approximately 55 km north west of the Sydney CBD. For planning information regarding the site, basic and planning property reports were acquired by DRC from the NSW Government Planning and Environment website (<https://www.planningportal.nsw.gov.au>) on 11 April 2017 and copies of these reports are provided in **Appendix A**. A general summary of the information regarding the site and its surrounds is presented in **Table 2-1** below.

**Table 2-1: General Site Information**

Site Location	The site is located at 65-73 Dunheved Circuit, St Marys, New South Wales ( <b>Figure 1</b> ).	
Current land use zoning and planning overlays	Zone:	Industrial 1 (IN1)
	Planning Controls:	Height of Building: M-12m
		Land Application LEP: Included – Penrith Location Environmental Plan 2010
		Minimum Lot Size: U- 1,000m <sup>2</sup>
		Scenic Protection Land: Scenic & Landscape Values
Municipality	Penrith City Council	
Title and plan information	Lot 1 on DP1175850	
Site Area (hectares)	Approximately 0.41 ha	
Current site use	The site is currently industrial land with six tenants	
Surrounding land use	A review of the Planning & Environment website ( <a href="https://www.planningportal.nsw.gov.au">https://www.planningportal.nsw.gov.au</a> ) indicated that the surrounding properties were used for the following purposes: <ul style="list-style-type: none"> <li>• North: Industrial 1 (IN1)</li> <li>• East: Industrial 1 (IN1)</li> <li>• South: Industrial 1 (IN1)</li> <li>• West: Private Recreation (RE2) and Environmental Conservation (E2).</li> </ul>	
Proposed future use	Industrial Estate	

## 3 ENVIRONMENTAL SETTING

### 3.1 Geology & Hydrogeology

Survey of New South Wales Map indicates that the site is underlain by Quaternary aged fine-grained sand, silt and clay (Qal) and Tertiary Ages clay with patches of ferruginized consolidated sand (T1) (**Figure 3**). Topography of the site is provided in **Figure 2**.

A groundwater database search using the NSW Government Department of Primary Industries Office of Water website (<http://allwaterdata.water.nsw.gov.au/water.stm>) was also undertaken by DRC on 11 April 2017. The search identified no wells within 500m of the site and 12 registered groundwater bores within 1km radius of the site and 20 wells were found within a 2km radius (**Figure 4**). The closest listed groundwater well (Bore ID GW113135) appeared to be within the Sims Metal Management site on Christie Street, this site appears contain eight groundwater wells (GW113127 to GW113135). Information regarding these groundwater bores is presented in **Table 3-1** below.

No domestic or stock wells exist within 2km of the site.

**Table 3-1: Registered bores within a 2km radius of the site**

Bore ID	Approximate distance and direction from site	MGA Zone 56 Easting/ Northing (m)	Bore Depth (mbgl)	Standing water level	Further information
GW113127 (Sims Metals)	630m S	292963; 6263398	Not Recorded	Not Recorded	<u>Installation Date:</u> 21 April 2009 <u>Use:</u> Monitoring Bore <u>Lithology:</u> Information not provided
GW113128 (Sims Metals)	630m S	292990; 6263362	Not Recorded	Not Recorded	<u>Installation Date:</u> 21 April 2009 <u>Use:</u> Monitoring Bore <u>Lithology:</u> Information not provided
GW113129 (Sims Metals)	630m S	293027; 6263238	Not Recorded	Not Recorded	<u>Installation Date:</u> 28 April 2009 <u>Use:</u> Monitoring Bore <u>Operational Status:</u> Used <u>Lithology:</u> Information not provided
GW113130 (Sims Metals)	630m S	293126; 6263448	Not Recorded	Not Recorded	<u>Installation Date:</u> 22 April 2009 <u>Use:</u> Monitoring Bore <u>Operational Status:</u> Used <u>Lithology:</u> Information not provided

Bore ID	Approximate distance and direction from site	MGA Zone 56 Easting/ Northing (m)	Bore Depth (mbgl)	Standing water level	Further information
GW113131 (Sims Metals)	630m S	293030; 6263370	Not Recorded	Not Recorded	<u>Installation Date:</u> 27 May 2009 <u>Use:</u> Monitoring Bore <u>Operational Status:</u> Used <u>Lithology:</u> Information not provided
GW113132 (Sims Metals)	630m S	292976; 6263377	Not Recorded	Not Recorded	<u>Installation Date:</u> 25 May 2009 <u>Use:</u> Monitoring Bore <u>Operational Status:</u> Used <u>Lithology:</u> Information not provided
GW113133 (Sims Metals)	630m S	293027; 6263230	Not Recorded	Not Recorded	<u>Installation Date:</u> 27 May 2009 <u>Use:</u> Monitoring bore <u>Operational Status:</u> Used <u>Lithology:</u> Information not provided
GW113134 (Sims Metals)	630m S	292980; 6263433	Not Recorded	Not Recorded	<u>Installation Date:</u> 28 May 2009 <u>Use:</u> Monitoring Bore <u>Operational Status:</u> Used <u>Lithology:</u> Information not provided
GW113135 (Sims Metals)	630m S	293133; 6263491	Not Recorded	Not Recorded	<u>Installation Date:</u> 28 May 2009 <u>Use:</u> Monitoring Bore <u>Lithology:</u> Information not provided
GW11461 (Sydney Water)	750m N	293280; 6264950	11.02 (Screened 8.02m – 11.02m)	Not Reported	<u>Installation Date:</u> 31 March 2011 <u>Use:</u> Monitoring Bore <u>Operational Status:</u> Used <u>Lithology:</u> 0 - 0.4: Fill 0.4 – 6.6: Clay 6.6 – 9.2: Shale/Bedrock

Bore ID	Approximate distance and direction from site	MGA Zone 56 Easting/ Northing (m)	Bore Depth (mbgl)	Standing water level	Further information
GW111462 (Sydney Water)	750m N	293186; 6264746	11.02 (Screened 6.8m – 9.7m)	Not Reported	<u>Installation Date:</u> 31 March 2011 <u>Use:</u> Monitoring Bore <u>Operational Status:</u> Used <u>Lithology:</u> 0 - 0.25: Fill 0.25 – 6.8: Clay 6.8 – 11.0: Shale/Bedrock
GW111463 (Sydney Water)	750m N	293091; 6264773	9.77 (screened 6.2m – 9.2m)	No Reported	<u>Installation Date:</u> 31 March 2011 <u>Use:</u> Monitoring Bore <u>Operational Status:</u> Used <u>Lithology:</u> 0 - 0.2: Fill 0.2 – 0.4: Sand 0.4 – 3.0: Clay 3.0 – 5.0: Sand 5.0 – 5.5: Clay 5.5 – 9.8: Shale
GW109584 (Mobil/7-11)	1.1km SE	294075; 6263554	8.2	2.89	<u>Installation Date:</u> 14 January 2003 <u>Use:</u> Monitoring Bore <u>Operational Status:</u> Used <u>Lithology:</u> 0-1.6: Clay 1.6 – 2.2: Gravelly Clay 2.2 – 5.5: Clay 5.5 – 8.2: Shale/Bedrock
GW109585 (Mobil/7-11)	1.1km SE	294062; 6263554	8.2	2.40	<u>Installation Date:</u> 14 January 2003 <u>Use:</u> Monitoring Bore <u>Operational Status:</u> Used <u>Lithology:</u> 0 – 0.6: Fill Clay 0.6-3.9: Clay 3.9 – 6.2: Gravelly Clay 6.2 – 8.2: Shale/Bedrock

Bore ID	Approximate distance and direction from site	MGA Zone 56 Easting/ Northing (m)	Bore Depth (mbgl)	Standing water level	Further information
GW109586 (Mobil/7-11)	1.1km SE	294063; 6263598	1.5	Not Reported	<u>Installation Date:</u> 15 January 2003 <u>Use:</u> Monitoring Bore <u>Operational Status:</u> Used <u>Lithology:</u> 0 – 0.7: Fill Clay 0.7 – 1.5: Clay
GW109587 (Mobil/7-11)	1.1km SE	294035; 6263554	8.2	6.7	<u>Installation Date:</u> 15 January 2003 <u>Use:</u> Monitoring Bore <u>Operational Status:</u> Used <u>Lithology:</u> 0 – 0.4: Fill Clay 0.4 – 3.5: Clay 3.5 – 5.0: Gravelly Clay 5.0 – 7.5: Clay 7.5 – 8.2: Shale/Bedrock
GW109588 (Mobil/7-11)	1.1km SE	294055; 6263585	8.2	2.62	<u>Installation Date:</u> 16 January 2003 <u>Use:</u> Monitoring Bore <u>Operational Status:</u> Used <u>Lithology:</u> 0 – 0.7: Fill Clay 0.7 – 2.6: Clay 2.6 – 4.2: Gravelly Clay 4.2 – 7.2: Clay 7.2 – 8.2: Shale/Bedrock
GW112625 (Woolworths petrol)	1.7km SE	293923; 6262709	6.0 (Screened 3m – 6m)	Not Reported	<u>Installation Date:</u> 27 August 2009 <u>Use:</u> Monitoring Bore <u>Operational Status:</u> Used <u>Lithology:</u> 0 – 1.0: Fill 1.0 – 6.0: Clay

Bore ID	Approximate distance and direction from site	MGA Zone 56 Easting/ Northing (m)	Bore Depth (mbgl)	Standing water level	Further information
GW112626 (Woolworths petrol)	1.7km SE	293945; 6262719	6.0 (Screened 3m – 6m)	Not Reported	<u>Installation Date:</u> 27 August 2009 <u>Use:</u> Monitoring Bore <u>Operational Status:</u> Used <u>Lithology:</u> 0 – 1.0: Fill 1.0 – 6.0: Clay
GW112627 (Woolworths petrol)	1.7km SE	293964; 6262702	6.0 (Screened 3m – 6m)	Not Reported	<u>Installation Date:</u> 27 August 2009 <u>Use:</u> Monitoring Bore <u>Operational Status:</u> Used <u>Lithology:</u> 0 – 1.0: Fill 1.0 – 6.0: Clay

### 3.2 Surface water

The closest surface water bodies to the site are as follows:

- South Creek, located approximately 150 m to the southwest of the site, within the Dunheved Golf Course;
- A branch of South Creek, located approximately 800m to the north east of the site; and
- Ropes Creek, located approximately 1 km to the north east of the site.

## 4 SITE HISTORY REVIEW

In order to identify activities that have the potential to cause contamination that may have been undertaken at the site, a review of a range of media likely to provide insight into the history of the site was undertaken. The review is presented in the sections below.

### 4.1 Previous Environmental Site Assessments

It is understood by DRC that a previous soil contamination assessment (SCA) has been undertaken at the site and on the adjacent site. The following reports for the site were viewed with reports marked with a \* provided in hardcopy (**Appendix B**):

- OTEK (November 1996), *Background Investigation (Potential Contaminants) 65-87 Dunheved Circuit, St Marys*.
- Golder and Associates (August 1997), *Stage 2 Site Contamination Assessment 65-87 Dunheved Circuit, St Marys*.
- Golder and Associates (December 1998), *Remediation and Validation Areas 1 and 2, 65-87 Dunheved Circuit, St Marys\**;
- CSTS (December 2013), *Potential Asbestos & Hydrocarbon Contamination Report 65-75 Dunheved Circuit, St Marys NSW (MAG 1930/427)\**; and
- CSTS (January 2014), *Recycled Crushed Concrete Assessment Report 65-73 Dunheved Circuit, St Marys NSW (MAG1930/433)\**.

It should be noted that the OTEK and Golders Report are on the adjacent vacant land site, with only a small part of the investigative works undertaken on the site itself. Due to the quantity of documentation provided by Penrith City Council, only a brief review of the OTEK report was able to be undertaken. Additional enquires regarding obtaining a full copy of this report have to date been unsuccessful.

A summary of the above report is presented in **Table 4-1** below.

**Table 4-1: Summary of Historical Reports**

<b>OTEK (November 1996) – Background Investigation (Potential Contamination) 65-87 Dunheved Circuit, St Marys</b>	
<b>Objectives</b>	<ul style="list-style-type: none"> <li>• To assess soils at the former ASP plastics site (which is partially on the site) after a fire occurred in 1991.</li> </ul>
<b>Scope of Works</b>	<ul style="list-style-type: none"> <li>• A review of historical site information pertaining to the site.</li> </ul>
<b>Key Findings</b>	<ul style="list-style-type: none"> <li>• The site contained Ray Pont Powder storage (plastic coatings powder storage), the Rembrandt Club and an abandoned residence north of the Rembrandt Club. Additionally, three fibrous-cement buildings were located to the west of the Ray Pont Powder storage, which were reported to have been used by the army but had been unoccupied for over 20 years (i.e. since at least 1976). A methylated spirits storage shed was reported to be located on the site, between the ASP Plastics and Ray Pont Powder buildings. These buildings were evident as early as 1947.</li> <li>• To the south of the site the ASP Plastics building was situated, this building also contained the Rural Bag and Sack Co (manufactures polypropylene and hessian bags using imported material from India). The ASP Plastics site is only partially on the 65-73 Dunheved Circuit property. ASP Plastics produced bottles, PVC, polystyrene and car battery cases between 1984 and 1991. Two abandoned USTs exist near the former ASP Plastics building and an additional tank was noted on their figure in the southeast corner of the building footprint.</li> <li>• There was a site fire that started in the building and destroyed both ASP Plastics, the Rural Bag and Sack Co. and Ray Pont Powder in 1991. According to the NSW Fire Brigade and Penrith Council, the fire was extremely intense and destroyed the factory including machinery stock, motor lorrie and LPG forklift trucks. All that remained after the fire was the brick office building and concrete slab of the former factory floor.</li> </ul>

	<ul style="list-style-type: none"> <li>• After the fire a shed was built in the former Ray Pont Powder location (now current ANTQIP location) and Rural Bag and Sack Co moved in.</li> <li>• According to a site representative there has been significant historical illegal dumping at the site. This was evidenced by the number of tyres, rusted drums, stockpiled material and building materials located to the west and south of the former factory areas – within the flood plain areas.</li> <li>• OTEK concluded that there was potential to be oil impacted soils beneath the ASP Plastics building and UST areas and within fill material surrounding the buildings.</li> <li>• OTEK stated that no substantial soil contamination is expected to have occurred in connection with the current or previous uses of the abandoned residence, army sheds, the existing storage shed, the structure occupied by Rural Bag and Sack Co. or the Rembrandt Club.</li> </ul>
<b>Golder (August 1997) – Stage 2 Site Contamination Assessment 65-87 Dunheved Circuit, St Marys.</b>	
<b>Objectives</b>	<ul style="list-style-type: none"> <li>• Investigate the soil conditions at the site.</li> </ul>
<b>Scope of Works</b>	<ul style="list-style-type: none"> <li>• Undertaken 72 test pits across the site and investigate the known UST area in the vicinity of the former ASP Plastics building; and</li> <li>• Characterisation of soils for the ongoing industrial use of the site.</li> </ul>
<b>Key Findings</b>	<ul style="list-style-type: none"> <li>• Four areas were investigated. Area 1 (west of ASP Plastics concrete slab) was found to have heavy end hydrocarbon and metals impacts: TP34 (0-0.2m) and TP7 (0-0.2m) in Area 1 were found to contain concentrations of copper, lead, zinc and cadmium above the NEHF (F) criteria. Two samples Deeper samples did not report any metals exceedances. In addition, TP34 (0-0.2m) was found to have TPH C<sub>10</sub>-C<sub>36</sub> concentration of 22,800 mg/kg.</li> <li>• Area 2 (near the USTs) did not show levels of contamination above industrial use guidelines.</li> <li>• Area 3 (southwest corner of the ASP Plastics concrete slab) reported copper and zinc concentrations above ANZECC guidelines, but below NEHF (F) criteria.</li> <li>• Area 4 (beneath the ASP Plastics concrete slab) reported copper in one sample at 500 mg/kg.</li> <li>• Golder concluded that remediation of impacted soils in Area 1 were required to meet industrial criteria.</li> </ul>
<b>Golder (December 1998) – Remediation and Validation Areas 1 and 2, 65-87 Dunheved Circuit, St Marys</b>	
<b>Objectives</b>	<ul style="list-style-type: none"> <li>• Remediate two areas of known contamination in the vicinity of the former ASP Plastics building.</li> </ul>
<b>Scope of Works</b>	<ul style="list-style-type: none"> <li>• Remediate Area 1 (approximately 150 m<sup>2</sup>) which was found to be contaminated with heavy metals and hydrocarbons, in the near surface soils, above industrial use guideline values;</li> <li>• Remediate Area 2, the former UST area after the removal of the USTs by the site owner, which had potential hydrocarbon and heavy metals contamination; and</li> <li>• Characterisation of excavated soils for offsite disposal.</li> </ul>
<b>Key Findings</b>	<ul style="list-style-type: none"> <li>• Area 1 was found to have metals contaminated soil to approximately 0.25m in depth. Soils from Area 1 were scraped and stockpiled based on visual and odour observations and PID screening results. The soil excavated consisted of fill 0.1m (topsoil) overlaying a shaley clay fill.</li> <li>• Soils were disposed of to a licensed landfill. Residual soils in the excavation and those retained onsite after segregation were validated. Results were all below the adopted criteria for industrial use of the site.</li> <li>• Area 2 residual spoils from the walls and base of the UST excavation and resultant stockpiled soils were validated. The excavation was approximately 6m x 6m x 2m deep. PID readings were generally low (less than 10ppm), the walls and floor of the excavation were sampled.</li> <li>• Area 1 results were below the NSW EPA criteria for industrial use of the site.</li> <li>• Excavations were backfilled by the owner with the soils retained on the site and natural material excavated from other parts of the site.</li> <li>• Golder concluded that based on the results of the remediation and validation, that the likelihood of hydrocarbon and heavy metals contamination in the areas of remediation are considered to be low and acceptable for ongoing industrial use.</li> </ul>

<b>CSTS (December 2013) – Potential Asbestos &amp; Hydrocarbon Contamination Report 65-75 Dunheved Circuit, St Marys</b>	
<b>Objectives</b>	<ul style="list-style-type: none"> <li>To assess recycled crushed concrete placed on the site and determine if the material was impacted with asbestos; and</li> <li>Assess two areas of stained material to determined weather fluid has contaminated they soils.</li> </ul>
<b>Scope of Works</b>	<ul style="list-style-type: none"> <li>Undertook a soil investigation, which included a site walkover, recovery of 30 samples of the recycled crushed rock (TP101 to TP130) and two samples of stained areas (ST1 and ST2)</li> </ul>
<b>Key Findings</b>	<ul style="list-style-type: none"> <li>Test pits were undertaken on a 26m grid (where possible) and excavated using a backhoe to the depth of the recycled crushed concrete (i.e. 50 – 100mm). The area assessed was predominately along the main driveway in the site and in the western most portion of the site.</li> <li>Recycled crushed concrete material used included brick, tile and PVC plastic pipe. Limited evidence of foam, rubber and fabric were observed. The layer varied in thickness and was on average 50-100mm thick.</li> <li>Asbestos was not observed during the investigation. No asbestos fines were detected within any of the samples.</li> <li>Stained areas were 1300mmx600mm in size and assumed to be from a truck and/or trailer storage at the site.</li> <li>TPH was found in samples in the stained areas but of concentrations lower than HBILs for commercial/industrial land use. No concentrations of BTEX, naphthalene or volatile TPH were detected in any samples.</li> <li>CSTC concluded that the recycled crushed concrete product placed on the site is of suitable condition or ongoing commercial/industrial land use, from a contamination perspective in accordance with NEPM and WA DOH guidelines.</li> </ul>
<b>CSTS (January 2014) – Recycled Crushed Concrete Assessment Report 65-73 Dunheved Circuit, St Marys NSW</b>	
<b>Objectives</b>	<ul style="list-style-type: none"> <li>To assess recycled crushed concrete placed on the site and determine if the material was suitable for commercial/industrial land use.</li> </ul>
<b>Scope of Works</b>	<ul style="list-style-type: none"> <li>Review of the report (MAG 1930/427, above) detailing previous investigations;</li> <li>Walkover of the site to determine material composition and other properties through visual inspection;</li> <li>Excavation of 30 test pits (TP201 to TP230), recovery of 15 samples from the recycled crushed concrete and 15 samples from the interface of the recycled crushed concrete and underlying material.</li> <li>Re-sampling of stained areas noted in previous report.</li> </ul>
<b>Key Findings</b>	<ul style="list-style-type: none"> <li>The material had previously covered an area of 2 hectares, however at the time of the investigation material long the western side of the site had been scraped and stockpiled.</li> <li>Test pits were undertaken on a 26m grid (where possible) and excavated using a backhoe to the depth of the recycled crushed concrete (i.e. 50 – 100mm). The area assessed was predominately along the main driveway in the site and in the western most portion of the site.</li> <li>Laboratory analysis of metals, PAHs, TRH, BTEX, pesticides and PCBs was undertaken. All concentrations were below commercial/industrial land use.</li> <li>Only one area observed as stained during the previous investigation was able to be located. This area of stained material and a new stain, not previously identified was sampled during the investigation. TPH results for the stained areas were found to have increased, however all concentrations were below HILs for commercial/industrial use.</li> <li>CSTC concluded that the recycled crushed concrete product placed on the site is of suitable condition or ongoing commercial/industrial land use, from a contamination perspective in accordance with NEPM and WA DOH guidelines.</li> </ul>

Additional records pertaining to the site were also viewed at the at the City of Penrith Council offices. These included timelines and sampling undertaken for filling of the western portion of the site by SMEC. Filling

activities were undertaken to further develop the site and to raise the site above the 1-in-10 year flood plain level.

Based on the council files the intent to fill the site were first submitted in 1997. Both SMEC and Golder undertook various sampling events, with Golder undertaking representative sampling of over 60,000 tonnes of virgin excavated natural material (VENM) imported to site in 1999. Additional unknown fill material was also imported to the site, this was described as silty clay and silty sand fill material, this material was later tested by CSTS to confirm the contamination status (if any) of the additional non-VENM fill. CSTS reports are summaries above and provided in **Appendix B**. Based on the results from all historical environmental works undertaken at the site (prior to DRC works), imported fill soils at the site did not appear to be significantly contaminated or preclude the site for continued ongoing industrial use.

SMEC undertook soil assessment (2000), soils metals testing (2001) and compaction testing (2003) at the site.

## 4.2 Historical Aerial Photographs

A search of relevant historical aerial photographs was undertaken by reviewing the Aerial Photograph from Google Earth satellite imagery. Eight historical aerial photographs (**Appendix B**) were reviewed for the site from the years 2002 to 2016 and are summarised in **Table 4-2** below.

**Table 4-2: Historical Aerial Photographs**

Date	Site Description	Surrounding Land Use	Reference
2002	The site has a house sized structure in the eastern portion, with a large industrial sized shed behind it (current location and set out of Rembrandt Club and ANTQIP). A small shed also is visible next to the ANTQIP building. The remainder of the site appears undeveloped. Western portion of the site appears to be level.	<p><u>North:</u> A large industrial sized building exists adjacent to the northern boundary, beyond which is vacant land and other industrial sized buildings.</p> <p><u>East:</u> Large industrial size buildings are present across Dunheved Circuit.</p> <p><u>South:</u> A large square concrete slab is visible, beyond the slab there appears to be lots of soil stockpiles.</p> <p><u>West:</u> The golf course is visible to the west of the site.</p>	<a href="#">Google Earth 21 July 2002</a>
2004	The site appears relatively unchanged from the 2002 aerial photograph.	<p><u>South:</u> soil stockpiles are no longer visible.</p> <p><u>Other Directions:</u> conditions remain generally unchanged from the 2002 aerial photograph.</p>	<a href="#">Google Earth 22 December 2004</a>
2007	Site appears relatively unchanged from the 2002 aerial photograph, however a dirt road is evident in the western portion and areas around the industrial sized shed appear to have been gravelled and fenced.	<u>North:</u> An additional industrial sized building now exists in the western portion of the block and further industrial development is evident further north.	<a href="#">Google Earth 11 March 2007</a>
2011	Site appears to now have additional tenants, with a third area fenced. New area appears to have shipping containers and be a storage area. Shipping containers are also evident on the ANTQIP property, along with cars and several trucks. Shipping containers are now also visible near the southern boundary and the western portion of the site has been graded/filled with bare ground visible.	<u>All Directions:</u> conditions remain generally unchanged from the 2002 aerial photograph.	<a href="#">Google Earth 14 November 2011</a>

Date	Site Description	Surrounding Land Use	Reference
2012	Site appears to have been gravelled (except for western most boundary). Another yard has been fenced (in area of current Jaybro lease area) and appears to have storage racks. Several trucks are parked in the southern portion of the site and parked cars are present in the eastern portion of the site.	<u>All Directions:</u> conditions remain generally unchanged from the 2002 aerial photograph.	<u>Google Earth</u> <u>5 December</u> <u>2012</u>
2014	Lots of machinery is parked along the southern boundary of the site. Soil stockpiles are visible in the north-western portion of the site.	<u>All Directions:</u> conditions remain generally unchanged from the 2002 aerial photograph.	<u>Google Earth</u> <u>1 October</u> <u>2014</u>
2015	The western portion of the site now appears to have quarry type activities, with large stockpiles of various soil products. The central portion of the site appears to have less shipping container/storage and is half vacant.  The remainder of the property appears generally unchanged from the 2014 aerial photograph.	<u>All Directions:</u> Conditions remain generally unchanged from the 2002 aerial photograph.	<u>Google Earth</u> <u>3 March 2015</u>
2016	The western portion of the site appears graded with several vehicles and a soil stockpile visible.  The Jaybro yard appears mostly empty with the gravel surface visible.  The Ventia yard is now covered with shipping containers/sheds with the ground surface only visible along road ways.  ANTQIP yard now has the covered truck was visible on the northern boundary and another covered area east of the warehouse. Additional office sized buildings are visible attached to the southern end of the building. Additionally, there appears to be equipment stored along the western and northern boundaries of this lease area.	<u>All Directions:</u> Conditions remain generally unchanged from the 2002 aerial photograph.	<u>Google Earth</u> <u>30 November</u> <u>2016</u>

Based on OTEKs findings the eastern portion of the site was developed by 1947. At that time the Rembrandt Club building was present, along with a warehouse scale building (Ray Pont Powder storage). The ASP Plastics building was visible by the 1970s. After the 1991 fire which destroyed Ray Pont Powder and ASP Plastics, a new warehouse scale building was built on the Ray Pont Powder storage footprint, and Rural Bag and Sack Co moved in.

By 1994 only the Rembrandt Club and Rural Bag and Sack Co. occupied the site. The site also contained three fibrous-cement buildings to the west (abandoned by the army) and a small vacant shed to the south of the Rural Bag and Sack Co.

DRC noted by 2002, there only existed a residential scale building and a warehouse scale building behind. The remainder of the site appeared to be vacant grassed land. By 2011 the site was becoming more developed, with an additional fenced yard behind the warehouse and the site appeared to be used predominately for industrial and storage purposes. Further areas were fenced and used for storage from 2012 to the current time.

The former ASP Plastics building footprint has been visible in the aerial photos, with the northeastern corner of the former building extending into the site.

Over time further industrial development has occurred within the area, with residential development occurring north of the industrial estate (to the north).

Features identified during the aerial photograph review with the potential to cause contamination is the uncontrolled fill and fill quality – Derived from backfilling of the site with uncontrolled fill and the potential contaminating activities of current tenants at the site.

### 4.3 Historical Certificates of Title

Copies of the current registered certificate of title and plan were obtained through SAI Global on 27 April 2017 and information provided in the OTEK report. A summary of the certificates of title is provided in **Table 4-3** below.

**Table 4-3: Current and Historical Certificates of Title**

Volume/Folio Reference	Land Description/Activity	Period of Ownership	Proprietor
Unknown	Site granted to Phillip King as a part of 874 hectares	1806	Commonwealth of Australia
Unknown	Various private purchases take over the site	1877 - 1942	
14/31908 15/31908 16/31908 207/31908	Subdivision of land – Lots 16 and 207 are bought and sold several times before combining again all the lots together	1942 - 1973	H.K. Porter Australia Pty Ltd / Prospect County Council
	Purchase of combined titles	1979	Peshawar Pty Ltd
Lot 1/DP1175850	None listed	17 December 2014 to present	Maganic Brothers & Sister Pty Ltd

The certificates detailed the development of the land occurred in the early 1940s, with unidentified proprietors prior to 2014.

Copies of the above-mentioned certificates of title are presented in **Appendix A**.

### 4.4 Site Inspection

DRC undertook a site inspection in March 2017 prior to works commencing. The site was found to be an active site with six leaseholders. The site was fenced and gated.

The following features were observed during the first site inspection for each lease area. Details are also presented on **Figure 5A**.

**Dutch Rembrandt Club:**

- A residential scale building which contains a restaurant, seating and meeting space.
- Covered stage area, shipping container storage and large covered pergola.
- The ground surface is predominately gravel with areas of grass.
- Although access was partially available, due to the annual Dutch Festival fundraiser from Friday through the weekend, excavation within the area was no able to be undertaken. It was deemed though based on the existing use of the site and discussions with the site's caretaker that the site is of low risk in the context of this assessment.
- Site has overhead power and plumbed water.
- No sources of contamination or visible observations of contaminated were noted during the site walkover.

**ANTQIP (civil contracting and plant hire):**

- Site contains a large workshop/shed with concrete floor, a site office and a covered work area in the north-western corner of the site.
- Site has overhead power and plumbed water.
- The ground surface was generally gravel, with the exception of concrete areas north of the warehouse where equipment was washed down and worked on and areas where drums and other items were stored.
- Several large shipping containers were observed, these appeared to be used for storage.
- Several drums on pallets were noted within the concrete area.
- A large diesel AST was noted to the east of the workshop, staining was noted on and around the AST.
- Outside the north-western corner of the warehouse steel racking was noted, beneath the racking oily residue was noted on the ground and floating on puddles (in an area of approximately 3m x 2m).
- Staining was noted on graveled surfaces to the north and east of the workshop area – in areas used for truck parking.
- Equipment parking was also noted along the southern boundary of the site. Due to the amount and size of equipment and muddy ground conditions it was difficult to view the ground surface beneath. Based on the age (and some ill-repair) of the equipment there may be some surficial staining of the gravel beneath the equipment, however this would need to be confirmed once equipment was removed.

**Ventia (contractors):**

- Access to the site was limited to a site walkover only.
- Site contained storage of civil contractor materials both on the ground surface and in shipping containers, a site hut and portable toilet.
- The ground surface was generally clay with steel sheets covering parts of the main driveway. .
- No sources or visible evidence of contamination were noted during the site walkover.

**Jaybro (concrete barrier fabrication and storage of products for the construction industry):**

- Concrete barrier fabrication area surface was a mix of gravel and clay. .
- Site office present which uses a generator to power, no plumbed water to the site.
- Two storage shipping containers and covered area was observed for machinery. No staining or contamination sources noted.
- Storage yard has compacted gravel base. A site shed is present. The area is used for storage of geofabrics, steel grates and concrete products. No visible sources of contamination were noted. It was noted that the north-western corner of the site was approximately 1m above the adjacent northern property height and over 2m higher than Links Road on the western boundary.

**RCA Trucks:**

- Parking area and site hut were viewed on this portion of the site.
- Trucks with trailers used the area to park overnight after deliveries.
- Ground was generally covered in large ballast size material. Further importation of crushed rock was to be undertaken to cover the western most portion of the site within the week.
- A large diesel AST was present to refuel trucks, AST was in good condition and powered by an internal generator. Several drums of oil were also noted. No staining was noted on surface gravels.

**Superior Sandstone Supplies (crushing of sandstone into sand products):**

- Area contained several large stockpiles of sand products.
- No evidence of waste or resource transfer station were observed at the site (as per EPA site inspection 6 April 2016).
- No 'waste' or stockpiles of waste materials was observed on the site.
- Movement and loading of trucks using an excavator and conveyor belt were noted.
- Access to area was limited due to equipment movement, works were viewed from other properties boundaries.
- Two site sheds were present with covered seating area and portable toilets.
- No sources of contamination were observed.

An additional site visit was undertaken by DRC on 24 January 2019 to inspect if any changes had occurred at the site since March 2017. The following was observed, details are presented on **Figure 5B**:

**Dutch Rembrandt Club:**

- No significant changes noted.
- Potential asbestos containing materials (ACM) sheeting within eaves noted.
- No sources of contamination or visible observations of contaminated were noted during the site walkover.

**ANTQIP (civil contracting and plant hire):**

- A small stockpile of crushed glass was noted in the rear driveway of the property.
- Area previously noted to the east of the workshop, staining was noted on and around the AST.
- Area outside the north-western corner of the warehouse steel racking which was noted to contain oily residue was noted to be residue free, but due to overgrown vegetation full inspection was not able to be undertaken.

**Ventia (contractors):**

- No access was available during 2018, all observations were taken from outside the site fence.
- Additional storage of equipment was noted in the south western portion of the site. Site still used for storage of equipment.
- No sources or visible evidence of contamination were noted during the site walkover.

**Jaybro (concrete barrier fabrication and storage of products for the construction industry):**

- Site now consists of original viewed area (2017) and entire back of the site.
- Large amount of stored construction items (temporary fencing, geofabrics, scaffolding) and concrete fabricated items (pits and barriers)
- Small (approximately 5,000L) diesel AST present where former large AST operated by RCA was observed in 2017. AST was in good condition and powered by an internal generator. No staining was noted on surface gravels.
- No visible evidence of contamination were noted during the site walkover.

## 4.5 Historical Maps

A search of the 1934 edition of UBD/Gregory's was undertaken online (<http://voommaps.com/historical-maps/1934-gregorys-sydney-street-directory/>) on 11 April 2017. The map did not extend out as far as St Marys, a review of the 1939 directory also did not extend to St Marys.

A review of a 1939 Sydney Suburban railway map which showed the train running west from Parramatta to Penrith (and beyond to the Blue Mountains), by the 1950s a spur line running north from near St Marys to "Dunheved" and "Rope's Creek" stations. The line was used to transport workers to military ammunitions factories to St Marys during World War II. By 1969 an additional station (after Dunheved) called "Cochrane" was added. It is understood that the spur line closed in the mid-1980s.

The current Gregory's street directory shows Rembrandt Dutch Club at the site with a disused railway along the western boundary.

## 4.6 Potential of Acid-Sulfate Soils (PASS)

A review of the Australian Soil Resource Information System was undertaken online (<http://www.asris.csiro.au>) was undertaken on 11 April 2016, the risk for PASS was considered extremely low. No further assessment of PASS is considered warranted.

## 4.7 Environmental Protection Authority

A search of the NSW EPA Public Register list of Certificates and Statements of Environmental Audit Reports (<http://www.epa.nsw.gov.au/prpoeoapp>) for the St Marys area on 18 April 2017, found three Audits within a 2 km radius of the site. Two Environmental Audits undertaken at Sims Metals 76-100 Christie Street, St Marys (compliance audit), which is approximately 630m south of the site and one audit at Tyrecycle located at 81-85 Christie Street (mandatory audit- pending, no details available), located 360m south of the site. Given the distance between the site and other Environmental Audit sites, a review of these EPA Audit Reports is not considered to be relevant for the purposes of this assessment.

## 4.8 Summary of Site History Review

Given the observations/findings relating to the site history review completed for the site, the following potential causes of contamination onsite have been noted:

- Uncontrolled Fill and Fill Quality – Derived from backfilling of the western portion of site with uncontrolled fill; and
- Inert waste items – Aesthetic impacts from inert waste within fill material

The risk for potentially acid sulphate soil (PASS) was considered extremely low for natural soils at the site.

Potential offsite sources of contamination were not identified during the site history review. It is noted that an industrial area exists in the vicinity of the site (Dunheved Industrial Park).

## 5 ENVIRONMENTAL WORKS METHODOLOGY

### 5.1 Relevant Documents

The soil assessments and validation works were undertaken in general accordance with the following:

- Australian Standards including:
  - AS4482.1 (2005) *Guide to the investigation and sampling of sites with potentially contaminated soil, Part 1: Non-volatile and semi volatile compounds (AS4482.1)*; and
  - AS4482.2 (1999) *Guide to sampling and investigation of potentially contaminated soil, Part 2: Volatile substances (AS4482.2)*.
- NSW EPA (1997) Contaminated Land Management Act (CLM Act);
- NSW EPA (2014), Waste Classification Guidelines, Part 1: Classification of Waste;
- National Environment Protection (Assessment of Site Contamination) Measure 1999. National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1); and
- New South Wales Government (2018), State Environmental Planning Policy (SEPP) No. 55 – Remediation of Land, 31 August 2018.

### 5.2 Contaminants of potential concern (COPCs)

COPCs have been identified for the site, as described in **Table 5-1** below, based on the contaminants identified during previous investigations and by DRC. In addition to the most likely COPCs listed below, a number of samples were analyzed for broad contaminant screens to cross check for unexpected contaminants.

**Table 5-1: Contaminants of Potential Concern Applicable to this Site**

Site Use	Contaminants of Potential Concern	Likely media in which COPCs may be identified at the subject site
<b>Subject Site</b>		
Industrial activities and parking of equipment	Total Recoverable Hydrocarbons (TRH) metals, PAHs, BTEXN	Ground surface and shallow soils
Uncontrolled Fill used for levelling of site	TRH, metals, PAHs, asbestos	Fill, shallow soils, deeper soils in the western portion of the site
<b>Offsite</b>		
Industrial land surrounding the site	TRH, metals, asbestos	Ground surface and shallow soils

### 5.3 Data quality objectives

To assist with the design of the assessment program the following data quality objectives have been considered.

**Table 5-2: Data Quality Objectives**

Step	Objective	Site Relevant Comments
1	State the problem	<i>Has contamination of soil occurred that may impact upon future industrial use of the site.</i>
2	Identify the decision	Collection of data to establish: <ul style="list-style-type: none"> <li>• <i>If uncontrolled fill is suitable for the site;</i></li> <li>• <i>to reasonably investigate the extent and magnitude of soil pollution given site constraints.</i></li> </ul>

3	Identify inputs to the decision	<i>The completion of sufficient soil sampling to provide confidence in a dataset to characterise soil quality across the site, to the extent practicable.</i>
4	Define the study of boundaries	The subject site is defined as the site proposed for continued industrial use. The investigation is targeted to soils likely to be subject to human exposure.
5	Develop a decision rule	<i>Have we determined the extent of contamination with a degree of certainty as expected of environmental assessments?</i> <i>Test pits were located to provide coverage of the site to the extent practicable in the context of this assessment. Additional broad screen analysis and detailed analysis for COPCs was undertaken to provide additional certainty and consistency to the data set.</i>
6	Specify limits on decision errors	<i>Quality assurance and quality control measures based on AS4482.1 and NSW EPA Waste Classification Guidelines.</i>
7	Optimise the design for obtaining data	<i>Undertaking the investigation in a manner and to a level of accuracy and confidence as described in NEPM documentation.</i> <i>AS4482 will form the basis upon which requirements for sampling are determined. Given the broad acre scale of the site, an iterative approach to data collection will be adopted with a broad scale grid applied to determine fill quality and thickness.</i> <i>All sample locations to attempt to intersect natural ground or extend to at least 2.0m BGS.</i>

## 5.4 Assessment Domain

Previous assessment works (Golder and CSTS) the site have resulted over 60 investigation locations across the area.

An additional 19 test pits (TP01 to TP19) were undertaken, by DRC, across accessible areas of the site to assess fill quality and contamination levels.

The location of test pits are also described on **Figure 6**.

Based on information obtained from Penrith City Council the western portion of the site had been filled (to a depth unknown) as part of works conducted between approximately 1999 and 2003 to level the site and to raise it above the surrounding 1 in 10-year flood plain level.

### 5.4.2 Soil Sampling

The soil sampling for the site was conducted in the following manner:

- Pre-site investigation planning including underground services location;
- Advancement of test pits into natural soils (where possible);
- Test pit field logging including lithology and geology encountered, photographs of the sub-surface conditions and observations for potential contamination;
- Inspection of test pits for potential asbestos containing materials (ACM);
- PID screening;
- Collection of test pit soil samples directly from the excavator bucket using a nitrile gloved hand;
- Based on the site's history of use, field observations and the PID screening, selected samples were analysed for:
  - Four fill samples for NSW DECC Waste Classification suite;
  - TRH, PAHs, BTEX, metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn), pH and EC; and
  - Selected shallow samples for asbestos.
- Collection of quality control (QC) samples including duplicate and inter-lab split samples at a rate of 1 sample pair per 20 samples, daily field blank samples and decontamination rinsate samples;
- Preservation of samples with ice during field activities and transport from the field to the laboratory;

- Transportation of samples to a NATA accredited laboratory with accompanying chain of custody (COC) documentation; and
- Analysis by NATA accredited laboratories.

There was no driver to indicate soil vapour could be a media to assess and therefore soil vapour sampling was not undertaken.

## 5.5 Decontamination Procedures

During test pit excavation works care was taken to ensure all loose soil was shaken from the excavator bucket between sample locations to minimize the potential of cross contamination between locations. Soil samples were taken directly from the excavator bucket with nitrile gloved hand, making sure that samples were taken from the centre of the excavator bucket and not from soil touching the bucket sides. Gloves were changed between each location.

Disposable equipment (i.e. nitrile gloves, tubing, bailers) do not require decontamination due to its single use.

## 5.6 Quality Assurance and Quality Control Objectives

**Table 5-3** summarises QA/QC objectives for this assessment. These objectives are consistent with current EPA guidance and NEPM objectives and are considered appropriate for this investigation.

**Table 5-3: Summary of QA/QC Objectives**

Item	Objective
Comparison of field and analytical data	Agreement between visual, olfactory & PID measurements with laboratory results, where contamination is suspected in the field, laboratory analysis results support the observations.
Calibration of field instruments	Relevant equipment to be used to be supplied with certificates confirming equipment is in calibration. Calibration sheets are provided in <b>Appendix H</b> .
Chain of Custody documentation	Signed and complete for all samples analysed.
Sample analysis and extraction holding times	Compliant with guides provided by laboratory (that are generally NEPM compliant).
Analysis of inorganic duplicate samples	RPDs <50%.
Analysis of organic duplicate samples	RPDs <50%.
Analysis of field blanks, including trip and equipment blanks as appropriate	No contamination of blanks for soil samples.
Analysis of laboratory method blanks	No contamination of blanks.
Analysis of spike recoveries	Recoveries 70-130%.
Analysis of laboratory duplicates	RPDs within 20-35%.

Where QC results are outside those specified above, a specific investigation of the cause has been completed and provided within the QA/QC report supplied as **Appendix F**, including an interpretation of the potential impacts upon the reliability of the dataset.

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

- The internal laboratory quality control program reported acceptable results.
- The field sampling procedure was carried out in general accordance with the DRC QA/QC program.

- The RPDs for blind and split samples were acceptable, although a few elevated RPD (>50%) were noted. However, these are not considered to impact on the integrity of the data set.
- Laboratories used were NATA accredited for the analyses performed.
- Samples were analysed within the applicable holding times.

DRC consider that the sampling and analytical programs were acceptable, and the results obtained are of reliable quality.

## 6 ASSESSMENT FIELDWORKS SUMMARY

Fieldworks conducted by DRC were undertaken in March 2017. All works were undertaken under the supervision of an experienced Environmental Scientist from DRC, who is trained and experienced in soil investigation and environmental site assessment works.

A summary of fieldworks undertaken is presented in **Table 6-1** below.

**Table 6-1: Summary of Fieldworks Undertaken**

Activity	Works Undertaken By	Date	Description of works
Soil Investigation	DRC	23 March 2017	Utility Location and site walkover.
		24 – 25 March 2017	Excavation of 19 test pits across the site for visual assessment of fill and natural soil conditions. No access was granted to the Ventia tenanted area or to the Dutch Rembrandt Club, so these areas could not be assessed.
		24 January 2018	Site walkover

## 7 ASSESSMENT CRITERIA

### 7.1 Soil Assessment

#### 7.1.1 Adopted Soil Assessment Criteria

For the purpose of assessing analytical results of the soil samples collected during the assessment, primary reference has been made to the various guidelines contained within the NEPM 2013.

The adopted soil assessment criteria are presented in **TABLE 7-1**.

**Table 7-1: Soil Assessment Criteria**

Protected Land Uses	Adopted Assessment Criteria
Ecosystems Protection	<p>To establish the presence of soil contamination with regards to ecological risks the following criteria have been adopted, as recommended in the NEPM 2013:</p> <ul style="list-style-type: none"> <li>• General Ecological Investigation Levels (EILs) for arsenic and lead, and site specific ecological investigation levels for copper, nickel, chromium III and zinc (based on the average pH at the site of 7.14, the conservative cation exchange capacity of 5 and clay content of 10%); and</li> <li>• Generic Ecological Screening Levels (ESLs) for DDT, benzene, toluene, ethylbenzene, xylenes, naphthalene, B(a)P and TPH fractions.</li> <li>• As stated in the NEPM 2013, EILs and ESLs are generally only applicable to the top two metres of the soil profile.</li> </ul> <p>For the purposes of this assessment the <i>Commercial/Industrial</i> exposure setting has been adopted.</p>
Human Health	<p>In order to assess the soils potential risk to human health, reference has been made to Health Investigation Levels and Health Screening Levels (HILs/HSLs), within the NEPM 2013. The HSLs are based on a range of site-specific conditions including land use, soil type and depth.</p> <p>The following exposure settings have been adopted for the purposes of this assessment:</p> <ul style="list-style-type: none"> <li>• HIL – Exposure setting ‘D’, which is applicable to the land use setting <i>Commercial/Industrial such as shops, offices, factories and industrial sites</i> and</li> <li>• HSL – Exposure setting ‘D’, which is applicable to the land use setting described above. Based on soil type, silty clay/sandy clay to be conservative, “Sand” guidelines have been adopted.</li> </ul> <p>If asbestos containing materials (ACM) are identified within soils, we refer to the guidance supplied within Chapter 4 of Schedule B1 - Guideline on Investigation Levels for Soil and Groundwater. With respect to the land surface from which asbestos has been removed, the Schedule B2 of the May 2013 revision of the NEPM (NEPM 2013) provides the following health investigation levels for assessment of protection of residential beneficial use land:</p> <ul style="list-style-type: none"> <li>• Bonded ACM must not exceed 0.01% of soil mass (w/w);</li> <li>• fibrous asbestos (FA) and asbestos fines (AF) must not exceed 0.001% of soil mass (w/w); and</li> <li>• No visible asbestos must be present in surface soils.</li> </ul>
Buildings and Structures	<p>To establish the risk soils pose to buildings and structures at the site, criteria outlined in the Australian Standard 2159 (2009) <i>Piling Design and Installation</i> have been adopted.</p> <p>For the purposes of this assessment and in accordance with the Land SEPP, pH and sulphate have been adopted as the relevant indicators of the potential risks associated with this beneficial use.</p>
Waste Classification	<p>In order to chemically classify soils for off-site disposal to a licensed landfill facility, reference has been made to the criteria noted within NSW EPA <i>Waste Classification Guidelines Part 1: Classifying Waste</i> - Table 1: CT1 and CT2 values for classifying waste by chemical assessment without TCLP test.</p>

## 8 FIELD QA/QC PROGRAM

A Quality Control / Quality Assurance (QA/QC) program was conducted by DRC at the site in accordance with the current regulatory requirements.

Specific elements of the QA/QC program included:

- The use of appropriately qualified/trained environmental scientists to perform the intrusive works;
- The use of standardised field sheets to record the findings of the site assessment activities;
- Undertaking appropriate equipment decontamination and/or avoiding the use of re-usable items for collection of samples in order to avoid/minimise sample cross-contamination and to ensure confidence in the sampling methodology employed, which in-turn allows the quantitative data-set to be relied upon;
- The collection and analysis of Quality Control samples;
- The use of Chain of Custody procedures to ensure the traceability of sample transport and handling (**Appendix E**);
- The use of laboratories accredited by National Association of Testing Authorities (NATA) for the analysis of soil, groundwater and surface water samples collected during the assessment works. As part of their NATA accreditation, both the primary and secondary laboratories perform a number of internal laboratory procedures to ensure precision and accuracy of laboratory sample preparation and analytical techniques are sufficient. Internal laboratory procedures include the following:
  - Internal duplicate analysis of samples for comparison of results to demonstrate precision;
  - Laboratory standards including matrix spike samples, laboratory control samples, certified reference material and surrogates are conducted as a basis to demonstrate accuracy; and
  - Internal laboratory blank samples are run to assess the potential for laboratory equipment errors.
- All sample analyses to be conducted using NATA registered methods in accordance with ANZECC (1992) and NEPM (2013) guidelines;
- Data quality objectives (DQO) are used for the assessment of the field and laboratory QA/QC analytical data and are outlined in the relevant sections within Sampling and Analysis Plan submitted for the site. Where any of the data quality indicators are not achieved for particular samples, steps were taken to rectify the non-conformance, if possible; and
- An assessment of the quality assurance program is required to be made in terms of completeness. The completeness is equal to the percentage of valid quality assurance and quality control results. The target for overall completeness is a minimum of 95%. A data completeness of less than 95% may be accepted where it can be justified based on unique issues such as:
  - Prevailing site conditions.
  - Data confidence required for assessment.
  - Testing methods adopted.

Summaries of the field and laboratory QA/QC programs and reviews of the laboratory data are provided in the sections below and the QA/QC results are presented in **Appendix D** and **Appendix F** of this report.

## 9 SOIL ASSESSMENT

### 9.1 Soil profile

After the excavation of 19 test pit locations across the site, DRC has investigated the subsurface profile and undertaken an evaluation of the soil profile at the site.

All test pits excavated by DRC reported fill material ranging from the surface to a thickness of 0.35 m bgl in the eastern portion of the site to over a thickness of 3.8 m in the western portion of the site. Natural soils were only encountered at locations TP01 to TP07 on the eastern portion of the site.

Soil logging of each test pit is provided as **Appendix G** to this report. Photographic logs of each test pit describing sub-surface conditions is supplied as **Appendix C**.

Information regarding the soil profile of the site are detailed in **TABLE 9-1** below.

**Table 9-1: Geological Profile Beneath the Site**

Sequence	Composition/ Lithology	Thickness / Depth	Comment
Fill	In all areas, a gravel layer, asphalt or grass layer exists.	Uneven distribution across the site, approximately 200mm thickness.	Present across the site with varying amounts of gravels and vegetation. Staining was noted at locations TP06 and SS01.
	Majority silty CLAY or sandy CLAY with occasional interbedded SAND layers and minor gravels. Small amounts of inert waste (bricks, concrete, pvc, wire, timber and sandstone cobbles) were identified in the majority of test pits.	Fill depth to 3.8m depth with occasional sand layers at 300mm thickness.	Predominantly silty Clay, well compacted, occasional sandy or gravel layer. No odours or staining were noted within the fill.
	Sandy SILT/ SILT, light brown, loose, powdery, dry.	At base of excavations at TP08 and TP15.	100mm thick at TP08 at a depth of 3.8m and 3.5m-3.8m in TP15.
Natural	Silty CLAY, with red, brown and grey mottle, medium plasticity, dry, hard/firm, dense.	Generally consistent across the eastern portion of the site.	Not encountered in the western portion of the site.

### 9.2 Anecdotal Information

Based on the visual findings during excavation works and discussion with Penrith City Council representatives the following was noted:

- Several complaints were received by the Penrith City Council pertaining to the mud on roadways and filling activities during the site filling works; and

- Filling was commenced to raise the level of the site, data pertaining to the source of the fill was not obtained prior to filling, environmental soil sampling works were undertaken to assess the fill quality once it was placed on the site.

### 9.3 Soil Assessment Analytical Results

Tabulation of all analytical results is provided in the **Tables Section** at the end of this report. **Figure 6** provides a description of the test pit locations (Via GPS) from which samples were collected.

NATA certified analytical laboratory reports for DRC collected data are provided in **Appendix D. TABLE 9-2** provides a further assessment of analytes noted to exceed adopted investigation levels.

**Table 9-2: DRC Investigation Soil Validation Sampling Results (mg/kg)**

Analyte	Reported Concentration Range (mg/kg)	Number of Samples (including QA)	Mean (mg/kg)	Median (mg/kg)	Std. Dev	95% UCL (mg/kg)	Exceedance of Default Investigation Levels (Shaded Cell)	
							NEPM ESL (Commercial/Industrial)	Human Health – Commercial/Industrial (HIL D) <sup>a</sup>
Benzo(a)pyrene	<0.5 – 3.7	43	<u>1.75</u>	<u>1.25</u>	<u>1.323</u>	<u>0.766</u>	0.7	NS
Benzo(a)pyrene TEQ	1.2 – 3.4	43	1.307	1.2	0.396	1.415	NS	40
TRH C <sub>16</sub> -C <sub>34</sub>	<100 – 22,000	43	<u>2236</u>	200	<u>5914</u>	<u>3143</u>	1700	NS
TRH C <sub>34</sub> -C <sub>40</sub>	<100 – 5,500	43	855	215	1668	518.4	3300	NS
F2-Naphthalene	<50 – 800	40	<u>306</u>	64	<u>427.8</u>	106	170	NS

Average assumes samples below LOR = LOR value

Underline = statistic is greater than guideline value

a: NEPM Schedule B(1) (NEPC 2013) Table 1A(1) – Health Investigation Levels (HILs) for soil contaminants.

NS – No investigation or screening level.

The arithmetic mean, standard deviation and 95% UCL for the above analytes was found to be above the adopted ESL guidelines for TRH C<sub>16</sub>-C<sub>34</sub>.

If surface scraping in the vicinity of TP06 is undertaken and soils disposed of offsite, statistical analysis shows that the arithmetic mean, standard deviation and 95% UCL would be below the guideline values for TRH C<sub>16</sub>-C<sub>34</sub>.

The mean, standard deviation and 95% UCL were noted to be above ESL guideline values for benzo(a)pyrene, however benzo(a)pyrene TEQ was below human health HIL D criteria.

The mean and standard deviation were noted to be above guideline values for F2-naphthalene, however the 95% UCL was found to be below the guideline value.

It should be noted that NEPM Table 1B(7) Management Limits were breached for at locations SS01 and TP06\_0.1, however these management limits have “less relevance at operational industrial sites...which have no or limited sensitive receptors in the area of potential impact”.

DRC recommends that during site development that these areas (SS01 and TP06) be cleaned up to the extent practicable.

### 9.3.1 Asbestos in Soil Assessment

In accordance with the assessment's initial phase of asbestos identification, each test pit excavated across the site were inspected for ACM by environmental scientist.

In addition to inspections, analysis for asbestos fibres in soil was undertaken at all locations.

The results of this analysis are reported in **Appendix D** of this report. A total of 18 samples were analysed for asbestos.

Analysis of surface soils across the site did not report free asbestos fibres within samples. A piece of bonded cement sheeting was found during excavation of TP19 (70mmx65mmx3mm) and submitted for analysis. This piece of cement sheeting reported the detection of chrysotile asbestos. It is noted that with reference to NEPM 2013 guidelines, Chapter 4 of Schedule B1, the assessed condition of the site is not deemed a health risk or non-compatible with industrial land use with respect to asbestos contamination.

It is noted though that all industrial land use site retain a potential for ACM cement sheeting to be present. During site re-development any encountered ACM is readily manageable under a Soil Management Plan during future construction works. If minor non-friable ACM is found during construction works a licensed person or a competently trained non-licensed person will be required to undertake the removal and disposal of asbestos.

In summary, free fibre asbestos was not identified within the shallow fill material at the site and no substantial quantities, burial zones of intensive concentrations of ACM debris or potential ACM debris were identified by this site assessment.

## 9.4 Summary of Soil Contamination

A discussion of the results obtained by DRC are provided below.

### 9.4.1 Ecosystem Protection

Upon review of collected analytical data benzo(a)pyrene TRH C<sub>16</sub>-C<sub>34</sub> and F2-naphthalene were reported above the NEPM ESL guideline. Although the reported at concentrations that may exceed NEPM ESL, analysis of the site soils reported an arithmetic mean below the ESL guideline TRH C<sub>16</sub>-C<sub>34</sub> and F2-naphthalene. Benzo(a)pyrene 95% UCL results were slightly above the ESL guideline.

It is deemed highly unlikely that the reported concentrations of the above compounds at the site will have any detrimental impact to the ecosystem.

### 9.4.2 Human Health

Based on the data set collected by DRC as reported within this DSI, all analytes assessed were reported at concentrations below the Health Investigation Level D (HIL D).

Extensive or persistent ACM has not been encountered at the site. As such, any asbestos encountered at the site is likely to be limited to isolated amounts of bonded ACM (cement sheeting) within the fill material. Any risk associated with asbestos during civil works at the site will be managed by a soil management plan (SMP).

### 9.4.3 Building and Structures

Based on field observations and pH results the soil conditions onsite are not considered to preclude the buildings and structures beneficial use. This conclusion is based on comparison to the applicable criterion as referenced within the *AS2159 Piling – Design and Installation*, indicating that the site is in the "Non-aggressive to Mild" condition range based on the pH reported at the site (4.9 to 9.8).

#### 9.4.4 Aesthetics

The NEPM states that aesthetic impacts to soil including solid inert foreign material is common in fill soil. To trigger an assessment of aesthetics the material would need to exhibit strong odours, have hydrocarbon sheen on surface water, have soil staining, show signs of putrescible refuse or animal burial. None of the fill soils exhibited any of these characteristics and as such, only a visual assessment of aesthetics has been undertaken.

The presence of small amounts of building rubble/solid inert waste (metal, pvc, timber, bricks, tiles, concrete, clay piping) was noted during excavation works within fill material. Fill material increased in thickness from east to west, with natural soils not encountered to a maximum depth of 3.8m in the western portion of the site.

No odours or staining were noted, with the exception of the following locations:

- SS01 – beneath steel racking system an oily residue was noted on the ground surface and floating on top of pooled water; and
- TP06 – surface soils were noted to be stained and have a diesel odour.

Both of these locations were assessed to be minor in scale and quantity and can readily be remediated with minimal cost and standard excavation equipment at the cessation of tenancy.

DRC recommends that soils in the vicinity of SS01 and TP06 be scraped, sampled and disposed of at a licensed landfill (anticipated to be less than 10m<sup>3</sup> in volume)

#### 9.4.5 Classification of Fill Material

Based on the guideline values, the majority of the fill material analysed was classified as general solid waste.

Locations TP02\_0.05, TP11\_0.7 and TP15\_2.0 reported benzo(a)pyrene above the general waste guideline, however as shown below in **TABLE 9-3** statistical analysis shows that the 95% UCL for benzo(a)pyrene and TPH C<sub>10</sub>-C<sub>36</sub> are less than the general solid waste value and therefore meets the CT1 general solid waste classification.

**Table 9-3: Soil Classification Sampling Results (mg/kg)**

Analyte	Reported Concentration Range (mg/kg)	Number of Samples (including QA)	Mean (mg/kg)	Median (mg/kg)	Std. Dev	95% UCL (mg/kg)	Exceedance of Default Investigation Levels (Shaded Cell)	
							CT1 (General Solid Waste)	CT2 (Restricted Solid Waste)
Benzo(a)pyrene	<0.5 – 3.7	43	1.75	1.25	1.323	0.766	0.9	3.2
TPH C <sub>10</sub> -C <sub>36</sub>	<50 – 26,060	43	2,060	220	6,106	3,721	10,000	40,000

## 10 ASSESSMENT CONCLUSIONS

The site subject to this report, namely 65-73 Dunheved Circuit, St Marys, has been subjected to environmental investigation, assessment and review.

The outcomes of the investigation program recently completed at the site and reported, summarized or referred to by this document, indicate that the site:

- Has been subjected to a history of industrial or commercial activities and site filling that may have a potential to contaminate land;
- Has been filled with soils that have been chemically tested by a professional environmental consulting firm to be compatible with commercial/industrial land use;
- Is not filled with soils that are of an unsuitable aesthetic quality for commercial/industrial land use as demonstrated by the current and historical intensive excavation works completed for the site;
- Has been visually inspected and validated for asbestos impacts with further analytical results reporting that no free asbestos fibres were detected. Any asbestos found during future site development is likely to be limited to isolated amounts of bonded ACM (cement sheeting) at the surface of the site or within the fill material;
- Soil results reported concentrations of benzo(a)pyrene above ESLs within fill material;
- All soil analytical results were reported to be below HIL D and HSL D and are not considered to pose a risk to future commercial/industrial users at the site;
- No waste stockpiles were noted across the subject property and there was no evidence of waste or transfer station use at the site;
- Remedial works required to remove oil stained soils and soils in the vicinity of SS01 and TP06 are envisaged to be minor in nature and would be achievable using standard equipment without a significant cost ramification; and
- Is in a current condition that, in DRC's opinion, is suitable for industrial land use and sub-division as an industrial estate with minor levels of post tenancy clean up required.

## 11 STATEMENT OF LIMITATIONS

This document has been prepared based on a specific brief provided to DRC Environmental by Borg Manufacturing Pty Ltd. This document has been prepared with care and consideration to acceptable standards and current industry practice. This document is based on sub-surface conditions that may be variable which may result in changes to procedures, advice, recommendations or professional conclusions established by this document. DRC Environmental therefore reserve the right to change or withdraw this report.

DRC Environmental recommends only suitably qualified and experienced contractors and consultants should undertake technical assessment of this document and attempt contaminated land remediation projects.

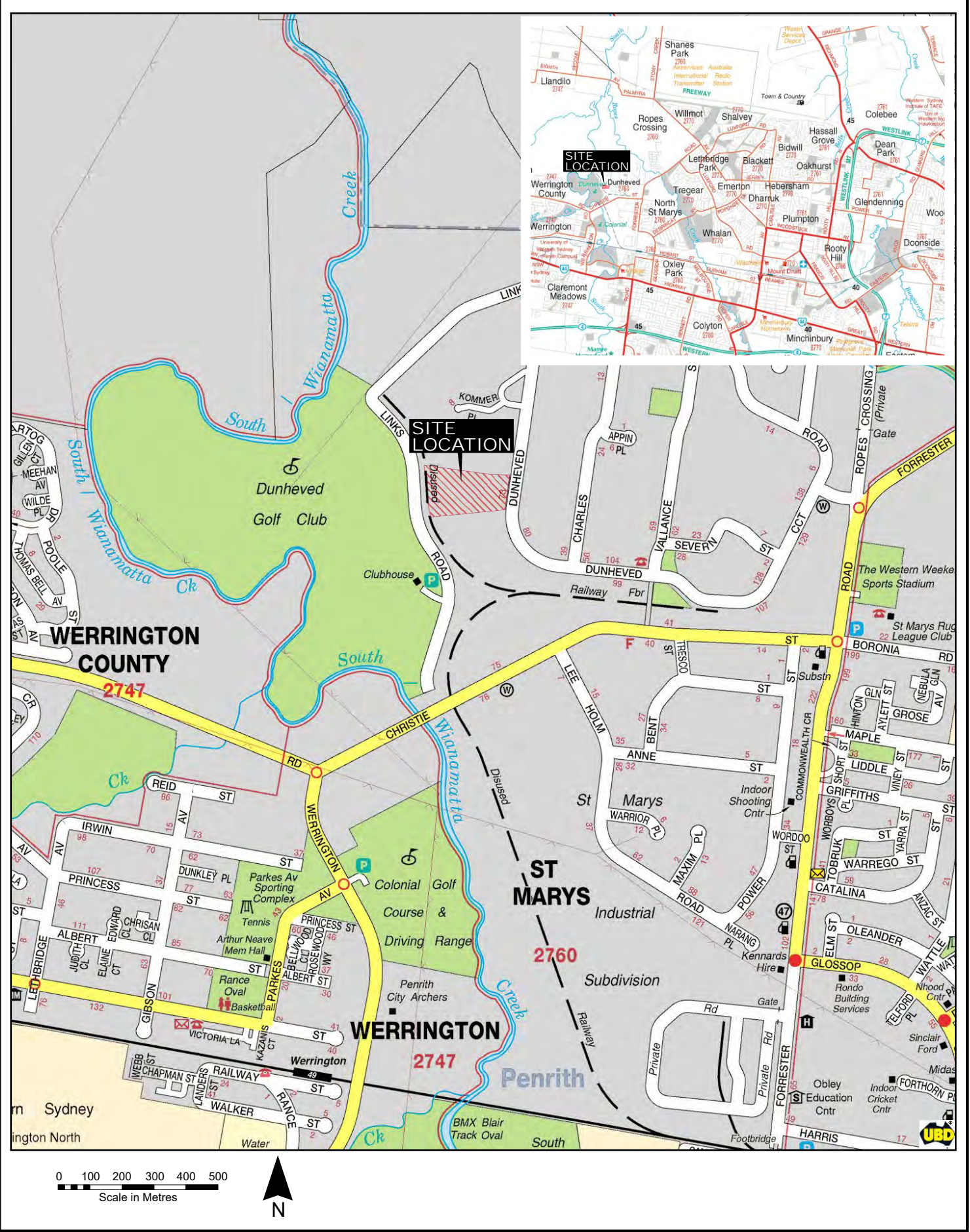
Report prepared by:




Patrick Baldwin CE<sub>EnvP</sub> SC  
Principal Environmental Engineer

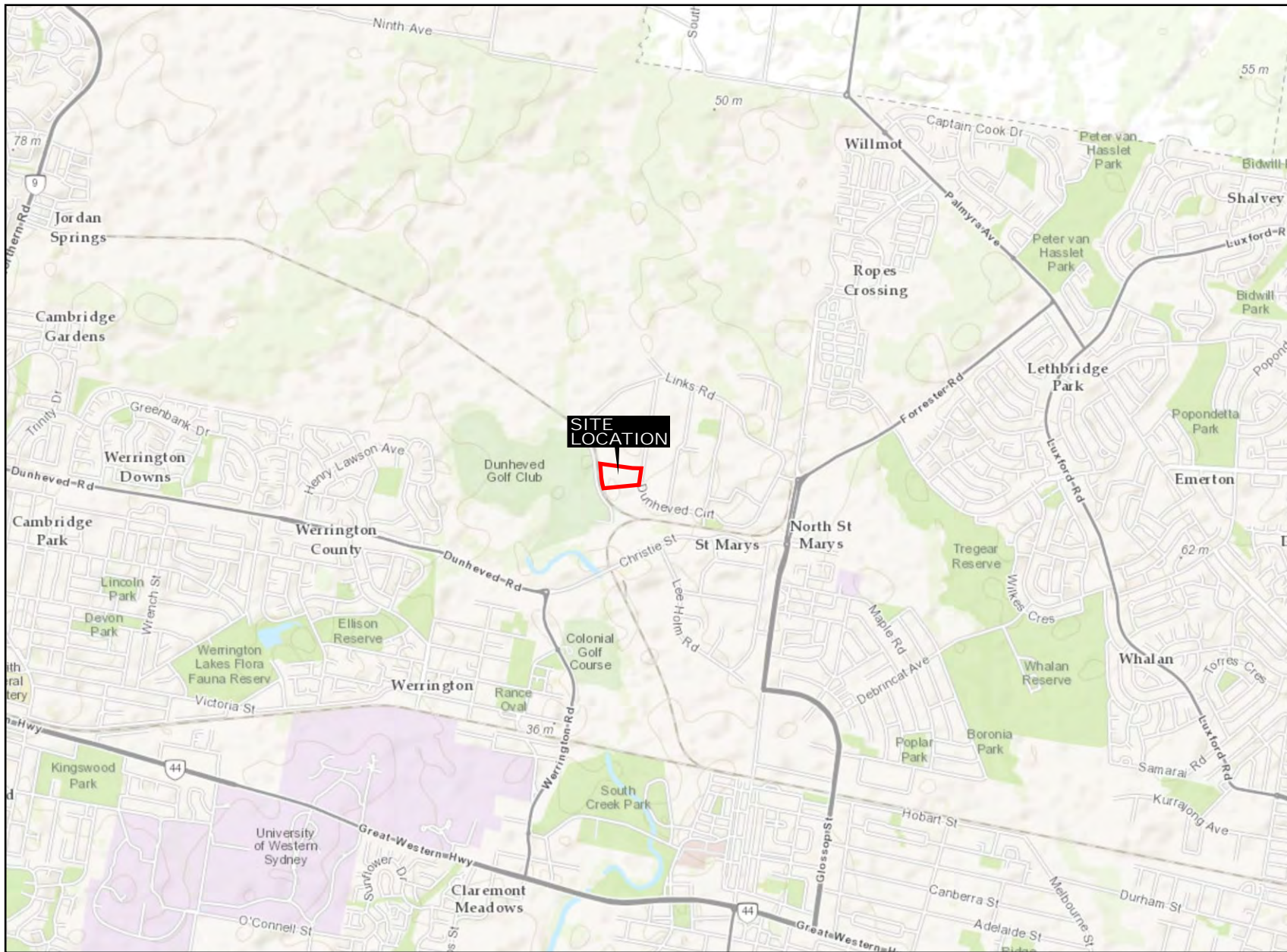
DRC Environmental Pty Ltd  
11 February 2019

# FIGURES



 <p><b>DRC ENVIRONMENTAL</b> DEVELOPMENT REMEDIATION CONSULTANTS</p> <p>DRC Environmental Pty Ltd "Development Remediation Consultants" PO Box 586, Rosanna VIC 3084 Website: www.drcenviro.com.au Email: admin@drcenviro.com.au Phone: 0402 455 638</p>	<p>PROJECT: <b>DETAILED SITE INVESTIGATION 65-73 DUNHEVED CIRCUIT, ST MARYS, NSW</b></p> <p>CLIENT: <b>BORG MANUFACTURING</b></p> <p>DATE: <b>April 2017</b></p> <p>DESIGNED: <b>RP</b></p>	<p>TITLE: <b>SITE LOCATION PLAN</b></p> <p>DRAWN: <b>LB</b></p> <p>SOURCE: <b>UBD City Streets</b></p> <p style="text-align: right;"><b>FIGURE 1</b></p>
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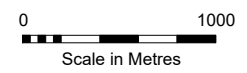
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**DRC ENVIRONMENTAL**  
DEVELOPMENT REMEDIATION CONSULTANTS

**LEGEND:**

Site location



TITLE:

**SITE TOPOGRAPHY**

PROJECT:

**DETAILED SITE INVESTIGATION  
65-73 DUNHEVED CIRCUIT,  
ST MARYS, NSW**

CLIENT:

**BORG MANUFACTURING**

DATE:

**April 2017**

DESIGNED:

**RP**

DRAWN:

**LB**

SOURCE:

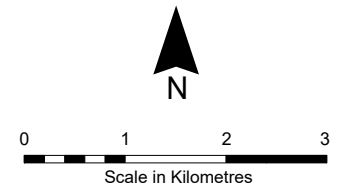
**ESRI  
ArcGIS online**

FIGURE: **2**

This figure remains the intellectual property of DRC Environmental Pty Ltd. This figure may only be used for environmental description purposes and remains the property of DRC Environmental Pty Ltd.



Rwa	Ashfield Shale	Qal	Fine grained sand, silt and clay	Volcanics
Rwb	Bringelly Shale	Qpc	Gravel, Sand, Silt, Clay	
Tl	Londonderry Clay	Tr	Conglomerate, matrix supported	



TITLE:  
**SITE GEOLOGY**

PROJECT:  
**DETAILED SITE INVESTIGATION  
65-73 DUNHEVED CIRCUIT,  
ST MARYS, NSW**

CLIENT:  
**BORG MANUFACTURING**

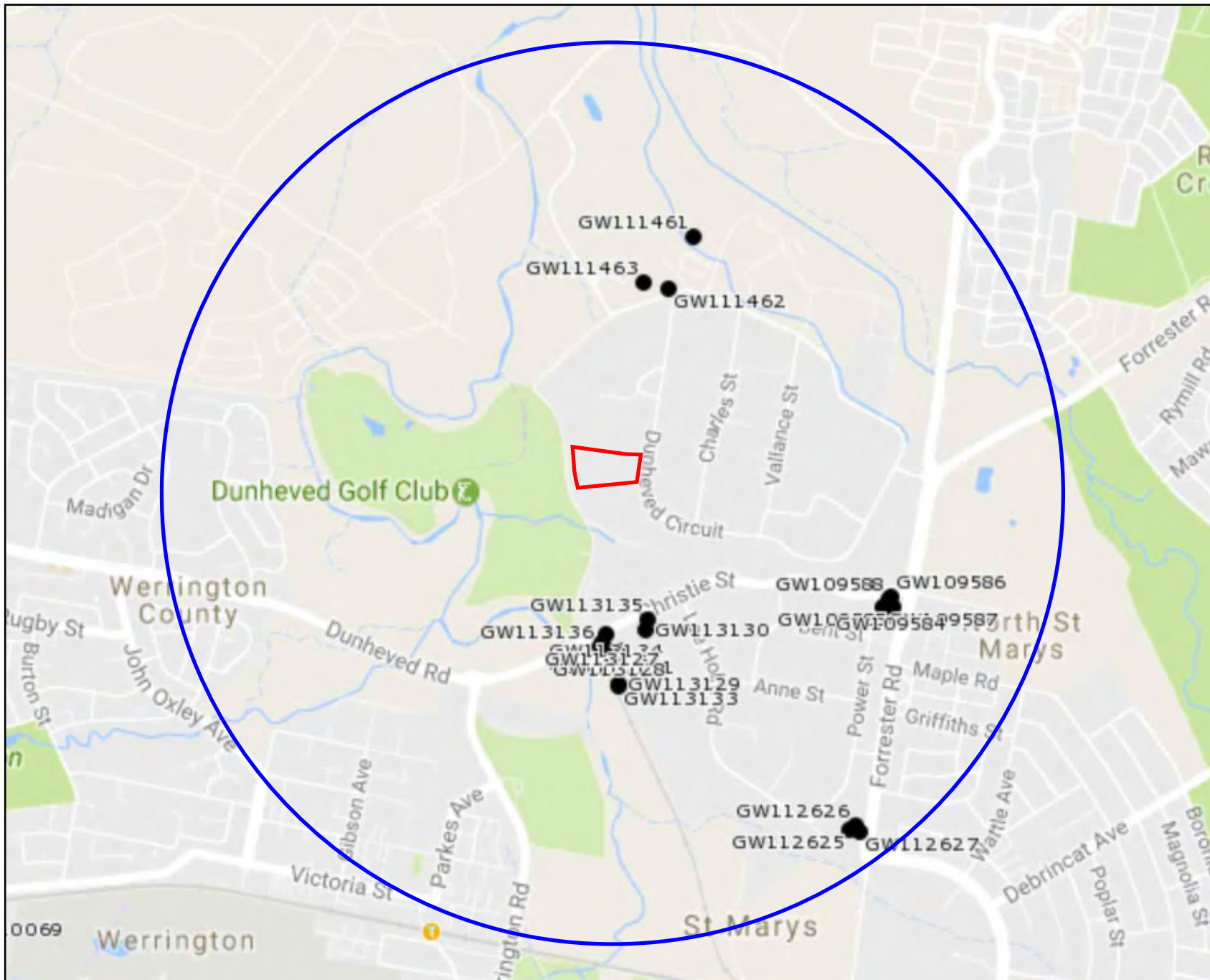
DATE: **April 2017**

DESIGNED: **RP**

DRAWN: **LB**

SOURCE: Resources and Energy.nsw.gov.au  
Penrith Geological Sheet 9035

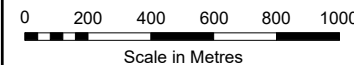
FIGURE: **3**



**DRC ENVIRONMENTAL**  
DEVELOPMENT REMEDIATION CONSULTANTS

**LEGEND:**

- 2Km radius from site
- Site boundary
- bore



TITLE:

**REGIONAL HYDROLOGY  
WITHIN 2Km OF THE SITE**

PROJECT:

**DETAILED SITE INVESTIGATION  
65-73 DUNHEVED CIRCUIT,  
ST MARYS, NSW**

CLIENT:

**BORG MANUFACTURING**

DATE:

**April 2017**

DESIGNED:

**RP**

DRAWN:

**LB**

SOURCE:

**NSW Govt. Dept. Primary  
Industries**

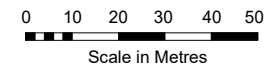
FIGURE: **4**



**DRC ENVIRONMENTAL**  
DEVELOPMENT REMEDIATION CONSULTANTS

**LEGEND:**

- Site boundary
- - - Approximate Lease Boundaries
- Above Ground Storage Tanks
- Area of oily sludge noted



TITLE:

**SITE LAYOUT 2017**

PROJECT:

**DETAILED SITE INVESTIGATION  
65-73 DUNHEVED CIRCUIT,  
ST MARYS, NSW**

CLIENT:

**BORG MANUFACTURING**

DATE:

**April 2017**

DESIGNED:

**RP**

DRAWN:

**LB**

SOURCE:

© 2017 Google Maps

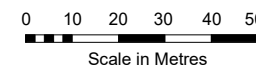
FIGURE: **5A**



**DRC ENVIRONMENTAL**  
DEVELOPMENT REMEDIATION CONSULTANTS

**LEGEND:**

- Site boundary
- Approximate Lease Boundaries
- Above Ground Storage Tanks



TITLE:

**SITE LAYOUT 2018**

PROJECT:

**DETAILED SITE INVESTIGATION  
65-73 DUNHEVED CIRCUIT,  
ST MARYS, NSW**

CLIENT:

**BORG MANUFACTURING**

DATE: **January 2018**

DESIGNED: **RP**

DRAWN: **LB**





SOURCE:

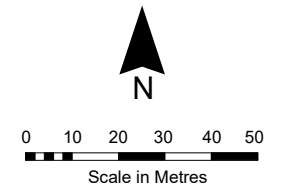
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FIGURE: **5B**



**LEGEND:**

- Site boundary
- - - Approximate Lease Boundaries
-  Above Ground Storage Tanks
-  Area of oily sludge noted
-  Test Pit Location
-  Surface Sample SS01



TITLE:

**TEST PIT LOCATION PLAN**

PROJECT:

**DETAILED SITE INVESTIGATION  
65-73 DUNHEVED CIRCUIT,  
ST MARYS, NSW**

CLIENT:

**BORG MANUFACTURING**

DATE: **April 2017**

DESIGNED: **RP**

DRAWN: **LB**

SOURCE:

© 2017 Google Maps

FIGURE: **6**

# TABLES







Table 1: Soil Analytical Results

Table with columns for various chemical elements and their concentrations in mg/kg. Rows include EQL, NEPM 2013 EIL, NSW 2008 General Solid Waste (No Leaching), NSW 2008 Restricted Solid Waste (No Leaching), NEPM 2013 Table 1A(1) HLLs Comm/Ind D Soil, NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand, NEPM 2013 Table 1B(6) ESIs for Comm/Ind, and NEPM 2013 Table 1B(7) Management Limits Comm / Ind.

Main data table with columns: Field ID, Sampled Date, Lab Report Number, and 38 columns for various chemical analytes (Arsenic, Beryllium, Cadmium, Chromium, Copper, Mercury, Molybdenum, Nickel, Selenium, Silver, Zinc, 4,4-DDE, p-BHC, Aldrin, p-BHC, chlordane, d-BHC, DDD, DDT, Dieldrin, Endosulfan I, Endosulfan II, Endosulfan sulphate, Endrin, Endrin aldehyde, Endrin ketone, p-BHC (Lindane), Heptachlor, Heptachlor epoxide, Methoxychlor, Toxaphene, Azinphos methyl, Boctar (Suipros), Chlorfenvinphos, Chlorpyrifos, Chlorpyrifos-methyl, Coumaphos, Demeton-O, Demeton-S, Dazinon).

Env Stds Description
NEPM 2013 Table 1B(7) Management Limits Comm / Ind: Management limits are applied after consideration of relevant ESIs and HSLs

Env Stds Comments
#1:Lead: HLLs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for where 50% bioavailability considered. Site-specific bioavailability should be considered where appropriate.
#2:Arsecnic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where appropriate (refer Shedule B7).
#3:Elemental mercury: HIL does not address elemental mercury, a site specific assessment should be considered if elemental mercury is present, or suspected to be present.
#4:Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application should consider presence of carcinogenic PAHs (should meet BaP TEQ HIL) & naphthalene (should meet relevant HSL)
#5:Derived soil HSL exceeds soil saturation concentraton
#6:To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#7:Moderate reliability. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#8:To obtain F2 subtract naphthalene from the >C10 - C16 fraction.
#9:Moderate reliability. To obtain F2 subtract naphthalene from the >C10 - C16 fraction.
#10:Separate management limits for BTEX & naphthalene are not available hence should not be subtracted from the relevant fractions to obtain F1 & F2





Table 1: Soil Analytical Results

	Fluorene	Indeno(1,2,3-c)pyrene	Naphthalene	PAHs (Sum of total)	Phenanthrene	Phenol	Pyrene	Parathion	Triphenyl-methyl	4,6-Dinitro-o-cyclohexyl phenol	Phenols (Total Halogenated)	Phenols (Total Non Halogenated)	Bis(2-ethylhexyl) phthalate	Butyl benzyl phthalate	Diethylphthalate	Dimethyl phthalate	Di-n-butyl phthalate	Di-n-octyl phthalate	Methyl Ethyl Ketone	4-Methyl-2-pentanone	Acetone	Allyl chloride	Carbon disulfide	EPN	C10-C16	C16-C34	C34-C40	F2-NAPHTHALENE	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)	C10 - C40 (Sum of total)	C6-C10	
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.2	0.2	20	1	20	5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	50	100	100	50	20	20	50	50	50		20	
NEPM 2013 EIL																																				
NSW 2008 General Solid Waste (No Leaching)																																				
NSW 2008 Restricted Solid Waste (No Leaching)																																				
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil				4000 <sup>#4</sup>		240000																														
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand																																				
0-1m			NL <sup>#5</sup>																																	
1-2m			NL <sup>#5</sup>																																	
2-4m			NL <sup>#5</sup>																																	
>4m			NL <sup>#5</sup>																																	
NEPM 2013 Table 1B(6) EQLs for Comm/Ind																																				
0-2m																									1700 2500	3300 6600	170									
NEPM 2013 Table 1B(7) Management Limits Comm / Ind																									1000 <sup>#10</sup>	3500 5000	10000									700 <sup>#10 800#10</sup>

Env Stds Description

NEPM 2013 Table 1B(7) Management Limits Comm / Ind: Management limits are applied after consideration of relevant EQLs and HSLs

Env Stds Comments

- #1: Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for where 50% bioavailability considered. Site-specific bioavailability should be considered where appropriate.
- #2: Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where appropriate (refer Schedule B7).
- #3: Elemental mercury: HIL does not address elemental mercury, a site specific assessment should be considered if elemental mercury is present, or suspected to be present.
- #4: Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application should consider presence of carcinogenic PAHs (should meet BaP TEQ HIL) & naphthalene (should meet relevant HSL)
- #5: Derived soil HSL exceeds soil saturation concentration
- #6: To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
- #7: Moderate reliability. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
- #8: To obtain F2 subtract naphthalene from the >C10 - C16 fraction.
- #9: Moderate reliability. To obtain F2 subtract naphthalene from the >C10 - C16 fraction.
- #10: Separate management limits for BTEX & naphthalene are not available hence should not be subtracted from the relevant fractions to obtain F1 & F2

**Table 2: Blank Analytical Results**

Field Blanks (WATER)  
Filter: SDG in('27 Mar 2017')

<b>SDG</b>	27-Mar-17	27-Mar-17	27-Mar-17
<b>Field ID</b>	TB01	TB03_250317	TB04_250317
<b>Sampled_Date/Time</b>	24/03/2017	25/03/2017	25/03/2017
<b>Sample Type</b>	Trip_B	Trip_B	Trip_B

Chem_Group	ChemName	Units	EQL			
BTEX	Benzene	µg/l	1	<1	<1	<1
	Ethylbenzene	µg/l	1	<1	<1	<1
	Toluene	µg/l	1	<1	<1	<1
	Xylene (m & p)	µg/l	2	<2	<2	<2
	Xylene (o)	µg/l	1	<1	<1	<1
	Xylene Total	µg/l	3	<3	<3	<3
	C6-C10 less BTEX (F1)	mg/l	0.02	<0.02	<0.02	<0.02
PAH/Phenols	Naphthalene	µg/l	10	<10	<10	<10
TPH	C6 - C9	µg/l	20	<20	<20	<20
	C6-C10	mg/l	0.02	<0.02	<0.02	<0.02



Table 3: Soil RPDs

Field Duplicates (SOIL)  
Filter: SDG in(27 Mar 2017)

Chem Group	ChemName	Units	EQL	27-Mar-17			ALS 28-Mar-17			27-Mar-17			ALS 28-Mar-17		
				Field ID	Sampled Date/Time	RPD	Field ID	Sampled Date/Time	RPD	Field ID	Sampled Date/Time	RPD	Field ID	Sampled Date/Time	RPD
	Benzo(a)pyrene TEQ (LOR)	mg/kg	0.5	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0
	Benzo(a)pyrene TEQ calc (Half)	mg/kg	0.5	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0
	Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
BTEX	Benzene	mg/kg	0.1 (Primary): 0.2 (Interlab)	<0.1	<0.1	0	<0.1	<0.2	0	<0.1	<0.1	0	<0.1	<0.2	0
	Ethylbenzene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0
	Toluene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0
	Xylene (m & p)	mg/kg	0.2 (Primary): 0.5 (Interlab)	<0.2	<0.2	0	<0.2	<0.5	0	<0.2	<0.2	0	<0.2	<0.5	0
	Xylene (o)	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0
	Xylene Total	mg/kg	0.3 (Primary): 0.5 (Interlab)	<0.3	<0.3	0	<0.3	<0.5	0	<0.3	<0.3	0	<0.3	<0.5	0
	C6-C10 less BTEX (F1)	mg/kg	20	<20.0	<20.0	0	<20.0			<20.0	<20.0	0	<20.0		
Inorganics	Conductivity (1.5 aqueous extract)	uS/cm	5	130.0	160.0	21	130.0			83.0	170.0	69	83.0		
	Moisture Content (dried @ 103°C)	%	1	8.9	8.3	7	8.9			18.0	21.0	15	18.0		
	pH (aqueous extract)	pH Units	0.1	8.4	8.6	2	8.4			6.6	6.9	4	6.6		
Lead	Lead	mg/kg	5	17.0	25.0	38	17.0	23.0	30	35.0	60.0	53	35.0	15.0	80
Metals	Arsenic	mg/kg	2 (Primary): 5 (Interlab)	2.3	2.8	20	2.3	<5.0	0	4.8	7.4	43	4.8	6.0	22
	Cadmium	mg/kg	0.4	<0.4	<0.4	0	<0.4	<0.4	0	<0.4	0.6	40	<0.4	<0.4	0
	Chromium (III+VI)	mg/kg	5 (Primary): 2 (Interlab)	7.1	9.2	26	7.1	9.0	24	10.0	20.0	67	10.0	22.0	75
	Copper	mg/kg	5	6.4	11.0	53	6.4	10.0	44	26.0	37.0	35	26.0	14.0	60
	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
	Nickel	mg/kg	5 (Primary): 2 (Interlab)	<5.0	5.9	17	<5.0	5.0	0	10.0	12.0	18	10.0	7.0	35
	Zinc	mg/kg	5	22.0	35.0	46	22.0	39.0	56	65.0	87.0	29	65.0	46.0	34
PAH	Benzo(b+)fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
PAH/Phenols	Acenaphthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Acenaphthylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo(a)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo(a) pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo(g,h,i)perylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Chrysene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Fluorene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Naphthalene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Naphthalene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	PAHs (Sum of total)	mg/kg	0.5	<0.5	<0.5	0	<0.5			<0.5	<0.5	0	<0.5		
	Phenanthrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
TPH	C10-C16	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0
	C16-C34	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
	C34-C40	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
	F2-NAPHTHALENE	mg/kg	50	<50.0	<50.0	0	<50.0			<50.0	<50.0	0	<50.0		
	C6 - C9	mg/kg	20	<20.0	<20.0	0	<20.0			<20.0	<20.0	0	<20.0		
	C10 - C14	mg/kg	20 (Primary): 50 (Interlab)	<20.0	<20.0	0	<20.0	<50.0	0	26.0	23.0	12	26.0	<50.0	0
	C15 - C28	mg/kg	50 (Primary): 100 (Interlab)	<50.0	<50.0	0	<50.0	<100.0	0	<50.0	<50.0	0	<50.0	<100.0	0
	C29-C36	mg/kg	50 (Primary): 100 (Interlab)	<50.0	<50.0	0	<50.0	<100.0	0	54.0	<50.0	8	54.0	<100.0	0
	+C10 - C36 (Sum of total)	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	80.0	<50.0	46	80.0	<50.0	46
	C6-C10	mg/kg	20	<20.0	<20.0	0	<20.0			<20.0	<20.0	0	<20.0		

\*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: 50 (1-10 x EQL); 50 (10-30 x EQL); 50 (> 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

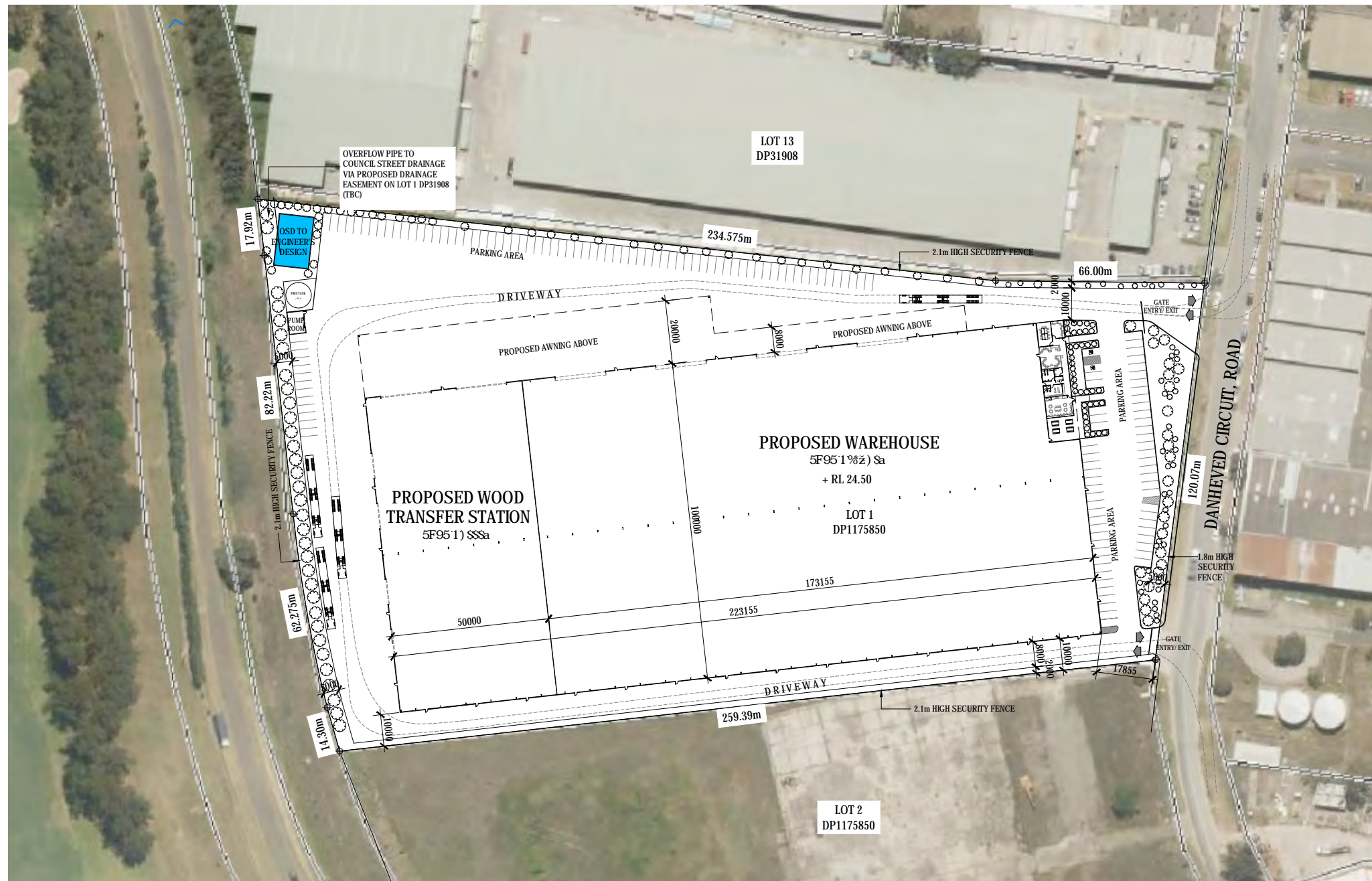
## APPENDIX A – SITE DETAILS

**SITE STATISTICS**

LOT 1 DP 1175850  
 TOTAL SITE AREA: (88) &a  
 BUILDING FOOTPRINT AREAS  
 TOTAL FOOTPRINT AREA: 88890a  
 SITE COVERAGE: 55.45%  
 BUILDING BREAK UP AREAS  
 PROPOSED WAREHOUSE 98% ) Sa  
 PROPOSED WOOD TRANSFER STATION ) SSSa  
 PROPOSED OFFICE 8% a

**PARKING REQUIREMENTS**

DESCRIPTION	AREA	SPACES
WAREHOUSE AND WOOD TRANSFER STATION	88% ) Sa	220
OFFICE:	8% a	3
TOTAL CAR PARKING SPACES REQUIRED		223
TOTAL CAR PARKING SPACES PROVIDED		145
TOTAL CAR PARKING FOR DISABLED		2



Issue	Description	Date	Drawn	Auth
A	FOR REVIEW	09-10-18	JHS	MD

**BORG CONSTRUCTION**

OFFICE:  
 2 Wells Way Somersby, NSW 2250 Australia  
 Tel: 02 4349 9800 Fax: 02 4349 9233

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Project  
**PROPOSED NEW BUILDING**

Location  
**65-75 DUNHEVED CIRCUIT, ST MARYS**

Drawing  
**SITE PLAN**

Scale  
 1 : 800@ A1  
 1 : 1600@ A3

Drawing Number  
**DA01**

Issue  
**A**

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH  
-----

FOLIO: 1/1175850  
-----

SEARCH DATE	TIME	EDITION NO	DATE
-----	----	-----	----
27/4/2017	12:29 PM	3	17/12/2014

LAND  
-----

LOT 1 IN DEPOSITED PLAN 1175850  
AT ST MARYS  
LOCAL GOVERNMENT AREA PENRITH  
PARISH OF ROOTY HILL COUNTY OF CUMBERLAND  
TITLE DIAGRAM DP1175850

FIRST SCHEDULE  
-----

MAGANIC BROTHERS & SISTER PTY LIMITED (TZ AJ49889)

SECOND SCHEDULE (5 NOTIFICATIONS)  
-----

1	D431274	EASEMENT FOR DRAINAGE 10.06 METRE(S) WIDE APPURTENANT TO THE LAND ABOVE DESCRIBED AFFECTING THE SITE OF PROPOSED DRAINAGE EASEMENT 33 FEET WIDE SHOWN IN DP431900
2	K561654	COVENANT AFFECTING THE PART SHOWN SO BURDENED IN THE TITLE DIAGRAM.
3	K561654	EASEMENT FOR WATER PIPELINE 3.05 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
4	DP1175850	EASEMENT FOR SERVICES VARIABLE WIDTH APPURTENANT TO THE LAND ABOVE DESCRIBED
* 5	AM98385	CAVEAT BY DDDS ST MARY'S PTY LIMITED

NOTATIONS  
-----

UNREGISTERED DEALINGS: NIL

\*\*\* END OF SEARCH \*\*\*

PRINTED ON 27/4/2017

\* Any entries preceded by an asterisk do not appear on the current edition of the Certificate of Title. Warning: the information appearing under notations has not been formally recorded in the Register.

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SAI Global Property Division an approved NSW Information Broker hereby certifies that the information contained in this document has been provided electronically by the Registrar General in accordance with section 96B(2) of the Real Property Act 1900.

# REGISTER OF DEPOSITED PLANS

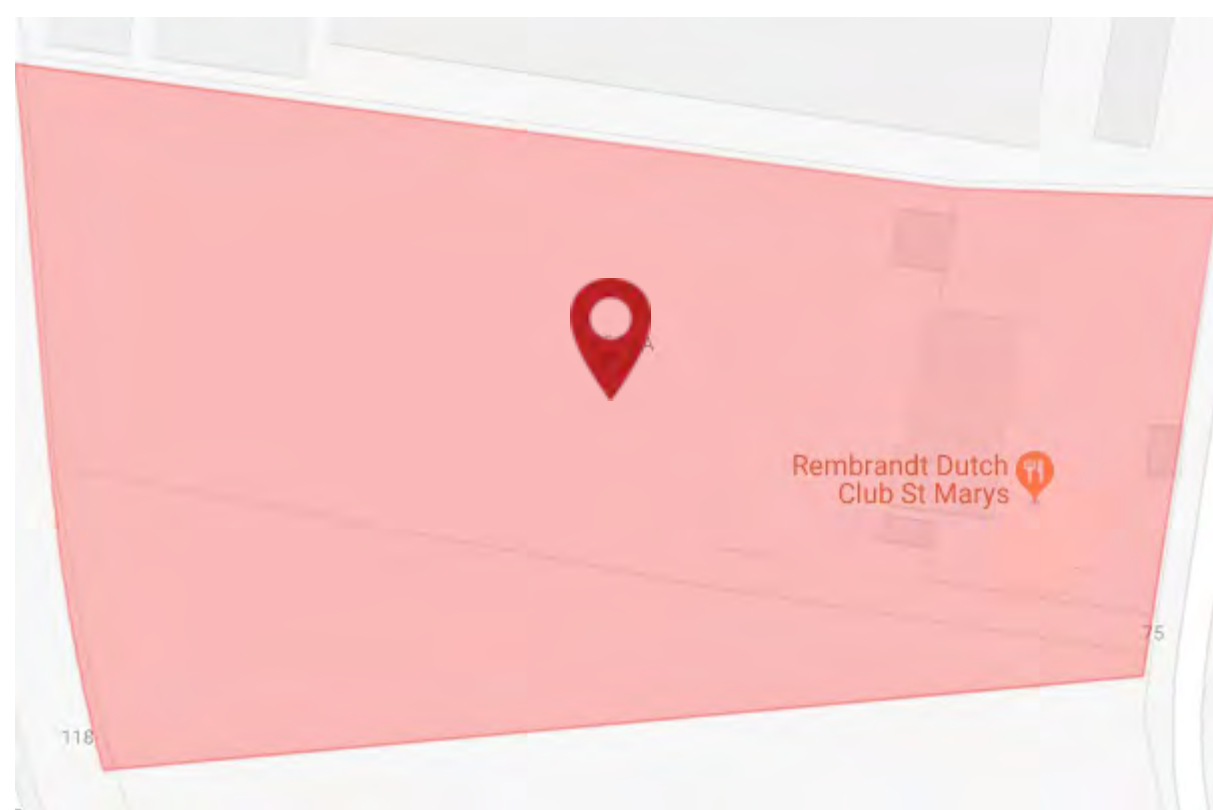
4559 5.60 V. C. N.

Date of regmt.	Lodging Party	Surveyor	Registered Propr. or Owner	Reference to Title	Previous Plan
12.60	Marsh, Harvey & Cropper	G. J. Hunter	Preview Subdivisions <sup>Ltd.</sup> Pty	Nol. 8087 Fol. 142	DP 1305
10.59	The Housing Commission of M.W.	W. H. Cooper	The Housing Commission of M.W.	Nol. 7820 Fol. 90	Central Alliance Sh. B. PA 36158
1.59	Ritchie & Arnold	R. B. Forster	Rudly Development Council <sup>Ltd.</sup> Pty	Nol 5844 Fol 231	4 DP 23648 MPS(RP) 120306
1.61	Wall, Abbott & White	H. J. Jones	South Pacific Developments <sup>Ltd.</sup> Pty	Nol. 8264 Fol. 228	4 ors. 8
1.60	The Housing Commission of M.W.	A. J. Plummer	The Housing Commission of M.W.	Nol 6275 Fol. 48	HCP 1684
12.60	Keith Thomas & Co,	G. W. Menzies	Francis Benjamin Camilleri <sup>Ltd.</sup>	Nol 3276 Fol 157	DP 8746 2 18111
3.1960.	Morris Hayes & Edgar	W. L. S. Hudson	P. E. Waugh & ors.	Nol 3308 Fol 10	DP 10566 Appn 26115 61747(L)
6.59	Commonwealth Crown Solicitor	J. P. Dynes	The Commonwealth of Australia	Nol 8237 Fol. 70	Appn 26115 4 ors.
6.59	Commonwealth Crown Solicitor	J. P. Dynes	The Commonwealth of Australia	Nol 8237 Fol. 69 & 70	Appn 26115 9 ors 81
12.59	Commonwealth Crown Solicitor	V. L. Ingham	The Commonwealth of Australia	Nol 8237 Fol. 70	Appn 26115 4 ors. 121
8.60	Commonwealth Crown Solicitor	T. M. Austin	The Commonwealth of Australia	Nol 8237 Fol. 70	Appn 26115 4 ors. 121
8.60	Commonwealth Crown Solicitor	T. M. Austin	The Commonwealth of Australia	Nol 8237 Fol. 70.	Appn 26115 4 ors. 121
12.60	Commonwealth Crown Solicitor	J. P. Dynes	The Commonwealth of Australia	Nol. 8237 Fol 70	Appn 26115 4 ors.
8.61	—	J. Fitzgerald	—	Formerly Regd Plan 102	See Queanbeyan
—	—	A. B. Lochran	—	Formerly MPS(O.S) 3313	See Queanbeyan
12.54	W. G. Holland	E. G. Lindsay	Thos. Pidcock & Sons Pty <sup>Ltd.</sup>	No. 893 Pl. 2270 & No. 571 Pl. 2275	Grafton Sh. 1

## Property Report for 65 Dunheved Circuit, St Marys, 2760

### Property Details

Address: 65 Dunheved Circuit, St Marys, 2760  
 Lot/Section/Plan no: 1/-/DP1175850  
 Council: PENRITH



### Council Details

#### PENRITH CITY COUNCIL

Website: <http://www.penrithcity.nsw.gov.au>  
 Phone Number: 02 4 732 7777  
 Email Address: [council@penrithcity.nsw.gov.au](mailto:council@penrithcity.nsw.gov.au)  
 Council Address: Civic Centre  
 Penrith 2750

### Planning Controls associated with this property

#### Land Zoning

- IN1 - General Industrial : (pub. 2010-09-22)

#### Contribution Plans (LGA-Based)

- Penrith CP 1993 - St Marys Town Centre  
 - Penrith CP 2003 - Cultural Facilities  
 - Penrith CP 2004 - Claremont Meadows  
 - Penrith CP 2004 - Lambridge Industrial Estate North Penrith  
 - Penrith CP 2005 - Lakes Environs (WatersideGreen)  
 - Penrith CP 2007 - District Open Space Facilities  
 - Penrith CP 2007 - Glenmore Park Stage 2  
 - Penrith CP 2007 - Local Open Space  
 - Penrith CP 2008 - Erskine Business Park  
 - Penrith CP 2008 - Penrith City Centre Civic Improvement - as amended 7 Aug 2015  
 - Penrith CP 2008 - Werrington Enterprise Living and Learning (WELL) Precinct Contributions Plan PDF

#### Development Control Plans (LGA-Based)

- Penrith DCP 2014 - Volume 1 - as amended 7 Jul 2016  
 - Penrith DCP 2014 - Volume 2 - as amended 19 Feb 2016

#### Height of Building

- M - 12.0 m : Range [ 12.0 - 12.9 m ] (pub. 2010-09-22)

#### Land Application LEP

- Included : Penrith Local Environmental Plan 2010 (pub. 2017-08-11)

#### Minimum Lot Size

- U - 1000.00 m<sup>2</sup> : Range [ 1000 - 1999 sqm ] (pub. 2010-09-22)

#### Scenic Protection Land

- Scenic & Landscape Values (pub. 2010-09-22)

### Other spatial data associated with this property

#### Local Government Area

- Penrith

#### Suburbs

- St Marys

## State Environmental Planning Policies which apply at 65 Dunheved Circuit, St Marys, 2760

State Environmental Planning Policy (Affordable Rental Housing) 2009 : (pub. 2009-07-31)  
State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004 : (pub. 2004-06-25)  
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 : (pub. 2008-12-12)  
State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 : (pub. 2004-03-31)  
State Environmental Planning Policy (Infrastructure) 2007 : (pub. 2007-12-21)  
State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 : (pub. 2007-02-16)  
State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007 : (pub. 2007-09-28)  
State Environmental Planning Policy No 19-Bushland in Urban Areas : (pub. 1986-10-24)  
State Environmental Planning Policy No 1-Development Standards : (pub. 1980-10-17)  
State Environmental Planning Policy No 21-Caravan Parks : (pub. 1992-04-24)  
State Environmental Planning Policy No 30-Intensive Agriculture : (pub. 1989-12-08)  
State Environmental Planning Policy No 33-Hazardous and Offensive Development : (pub. 1992-03-13)  
State Environmental Planning Policy No 36-Manufactured Home Estates : (pub. 1993-07-16)  
State Environmental Planning Policy No 50-Canal Estate Development : (pub. 1997-11-10)  
State Environmental Planning Policy No 55-Remediation of Land : (pub. 1998-08-28)  
State Environmental Planning Policy No 62-Sustainable Aquaculture : (pub. 2000-08-25)  
State Environmental Planning Policy No 64-Advertising and Signage : (pub. 2001-03-16)  
State Environmental Planning Policy No 65-Design Quality of Residential Apartment Development : (pub. 2002-07-26)  
State Environmental Planning Policy No 70-Affordable Housing (Revised Schemes) : (pub. 2002-05-01)  
State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 : Subject Land (pub. 2017-08-25)  
Sydney Regional Environmental Plan No 20-Hawkesbury-Nepean River (No 2-1997) : Sub Catchment Boundaries (pub. 1997-11-07)  
Sydney Regional Environmental Plan No 20-Hawkesbury-Nepean River (No 2-1997) : (pub. 1997-11-07)

## Planning Controls contained in the Penrith Local Environmental Plan 2010

### Height of Building

(1) The objectives of this clause are as follows:

- (a) to ensure that buildings are compatible with the height, bulk and scale of the existing and desired future character of the locality,
- (b) to minimise visual impact, disruption of views, loss of privacy and loss of solar access to existing development and to public areas, including parks, streets and lanes,
- (c) to minimise the adverse impact of development on heritage items, heritage conservation areas and areas of scenic or visual importance,
- (d) to nominate heights that will provide a high quality urban form for all buildings and a transition in built form and land use intensity.

(2) The height of a building on any land is not to exceed the maximum height shown for the land on the Height of Buildings Map.

## Planning Controls contained in the Penrith Local Environmental Plan 2010

### Land Zoning

#### Zone IN1 General Industrial

##### 1 Objectives of zone

- To provide a wide range of industrial and warehouse land uses.
- To encourage employment opportunities.
- To minimise any adverse effect of industry on other land uses.
- To support and protect industrial land for industrial uses.
- To promote development that makes efficient use of industrial land.
- To permit facilities that serve the daily recreation and convenience needs of the people who work in the surrounding industrial area.

##### 2 Permitted without consent

Nil

##### 3 Permitted with consent

Animal boarding or training establishments; Boat building and repair facilities; Car parks; Depots; Environmental facilities; Environmental protection works; Flood mitigation works; Freight transport facilities; Garden centres; General industries; Hardware and building supplies; Industrial retail outlets; Industrial training facilities; Industries; Kiosks; Landscaping material supplies; Light industries; Neighbourhood shops; Places of public worship; Plant nurseries; Recreation areas; Roads; Rural industries; Self-storage units; Signage; Storage premises; Take away food and drink premises; Timber yards; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Warehouse or distribution centres

##### 4 Prohibited

Hazardous industries; Offensive industries; Any other development not specified in item 2 or 3

## Planning Controls contained in the Penrith Local Environmental Plan 2010

### Minimum Lot Size

(1) The objectives of this clause are as follows:

- (a) to ensure that lot sizes are compatible with the environmental capabilities of the land being subdivided,
- (b) to minimise any likely impact of subdivision and development on the amenity of neighbouring properties,
- (c) to ensure that lot sizes and dimensions allow developments to be sited to protect natural or cultural features including heritage items and retain special features such as trees and views,
- (d) to regulate the density of development and ensure that there is not an unreasonable increase in the demand for public services or public facilities,
- (e) to ensure that lot sizes and dimensions are able to accommodate development consistent with relevant development controls.

(2) This clause applies to a subdivision of any land shown on the Lot Size Map that requires development consent and that is carried out after the commencement of this Plan.

(3) The size of any lot resulting from a subdivision of land to which this clause applies is not to be less than the minimum size shown on the Lot Size Map in relation to that land.

(4) This clause does not apply in relation to the subdivision of any land:

- (a) by the registration of a strata plan or strata plan of subdivision under the Strata Schemes Development Act 2015,  
or
- (b) by any kind of subdivision under the Community Land Development Act 1989.

(4A) Despite subclause (3), development consent must not be granted for the subdivision of land in Zone R2 Low Density Residential unless each lot to be created by the subdivision would have:

- (a) if it is a standard lot—a minimum width of 15 metres, or
- (b) if it is a battle-axe lot—a minimum width of 15 metres and a minimum area of 650 square metres.

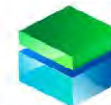
(4B) Despite subclause (3), development consent must not be granted for the subdivision of land in Zone R3 Medium Density Residential unless each lot to be created by the subdivision would have:

- (a) if it is a standard lot—a minimum width of 12 metres, or
- (b) if it is a battle-axe lot—a minimum width of 15 metres and a minimum area of 450 square metres.

(4C) For the purposes of this clause, if a lot is a battle-axe lot or other lot with an access handle, the area of the access handle is not to be included in calculating the lot size.




## APPENDIX B – AERIAL PHOTOGRAPHS AND PREVIOUS INVESTIGATION REPORTS



**DRC ENVIRONMENTAL**  
DEVELOPMENT REMEDIATION CONSULTANTS

**LEGEND:**

 Approximate site boundary



0 10 20 30 40 50  
Scale in Metres

TITLE:

**GOOGLE EARTH  
- 2002**

PROJECT:

**DETAILED SITE INVESTIGATION  
65-73 DUNHEVED CIRCUIT,  
ST MARYS, NSW**

CLIENT:

**BORG MANUFACTURING**

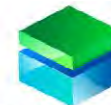
DATE: **April 2017**

DESIGNED: **RP**

DRAWN: **LB**


SOURCE:  
**Google Earth Pro  
21.07.2002**

APPENDIX: **B**



**DRC ENVIRONMENTAL**  
DEVELOPMENT REMEDIATION CONSULTANTS

**LEGEND:**

 Approximate site boundary



0 10 20 30 40 50  
Scale in Metres

TITLE:

**GOOGLE EARTH  
- 2004**

PROJECT:

**DETAILED SITE INVESTIGATION  
65-73 DUNHEVED CIRCUIT,  
ST MARYS, NSW**

CLIENT:

**BORG MANUFACTURING**

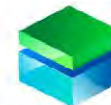
DATE: **April 2017**

DESIGNED: **RP**

DRAWN: **LB**


SOURCE:  
**Google Earth Pro  
22.12.2004**

APPENDIX: **B**



**DRC ENVIRONMENTAL**  
DEVELOPMENT REMEDIATION CONSULTANTS

**LEGEND:**

 Approximate site boundary



0 10 20 30 40 50  
Scale in Metres

TITLE:

**GOOGLE EARTH  
- 2011**

PROJECT:

**DETAILED SITE INVESTIGATION  
65-73 DUNHEVED CIRCUIT,  
ST MARYS, NSW**

CLIENT:

**BORG MANUFACTURING**

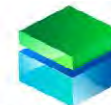
DATE: **April 2017**

DESIGNED: **RP**

DRAWN: **LB**


SOURCE:  
**Google Earth Pro  
14.11.2011**

APPENDIX: **B**



**DRC ENVIRONMENTAL**  
DEVELOPMENT REMEDIATION CONSULTANTS

**LEGEND:**

 Approximate site boundary



0 10 20 30 40 50  
Scale in Metres

TITLE:

**GOOGLE EARTH  
- 2012**

PROJECT:

**DETAILED SITE INVESTIGATION  
65-73 DUNHEVED CIRCUIT,  
ST MARYS, NSW**

CLIENT:

**BORG MANUFACTURING**

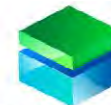
DATE: **April 2017**

DESIGNED: **RP**

DRAWN: **LB**


SOURCE:  
**Google Earth Pro  
10.11.2012**

APPENDIX: **B**



**DRC ENVIRONMENTAL**  
DEVELOPMENT REMEDIATION CONSULTANTS

**LEGEND:**

 Approximate site boundary



0 10 20 30 40 50  
Scale in Metres

TITLE:

**GOOGLE EARTH  
- 2014**

PROJECT:

**DETAILED SITE INVESTIGATION  
65-73 DUNHEVED CIRCUIT,  
ST MARYS, NSW**

CLIENT:

**BORG MANUFACTURING**

DATE:

**April 2017**

DESIGNED:

**RP**

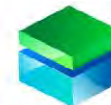
DRAWN:

**LB**

SOURCE:


**Google Earth Pro  
01.10.2014**

APPENDIX: **B**



**DRC ENVIRONMENTAL**  
DEVELOPMENT REMEDIATION CONSULTANTS

**LEGEND:**

 Approximate site boundary



0 10 20 30 40 50  
Scale in Metres

TITLE:

**GOOGLE EARTH  
- 2016**

PROJECT:

**DETAILED SITE INVESTIGATION  
65-73 DUNHEVED CIRCUIT,  
ST MARYS, NSW**

CLIENT:

**BORG MANUFACTURING**

DATE: **April 2017**

DESIGNED: **RP**

DRAWN: **LB**

SOURCE:  
**Google Earth Pro  
30.11.2016**

APPENDIX: **B**

Our Ref: 7067611  
Contact: Jackie Shephard  
Telephone: 02 47 32 7732

Maganic Brothers and Sister Pty Ltd  
135 Selkirk Avenue  
CECIL PARK NSW 2178

12 November 2015

Dear Sir

Penrith City Council is in receipt of an Access Application pursuant to the Government Information (Public Access) Act 2009 (*GIPA*) dated 13 October 2015.

In accordance with sections 54(2) and (3) of the GIPA Act, you are notified that the sought-after information: includes your business affairs.

The sought-after information that relates to you is enclosed for your consideration. The purpose of this notification is to ascertain whether you have an objection to the disclosure of the sought-after information and if so, what reasons you have to object to its release. If you object to the release of the information, please advise us of your reasons (*attached Consultation Process & Documents Affecting Business Affairs sheet*).

Penrith City Council will take any objection from you into consideration when deciding whether there is an overriding public interest against disclosure of this information.

If Penrith City Council decides to release the information and you have made an objection in regards to the release of the information, you will be notified of your right of review of that decision (section 54(6)).

If you choose to object to the release of the information, please forward your objection to Penrith City Council within 5 working days. Accordingly, Penrith City Council should receive any objection from you by 20 November 2015.

If I do not hear from you within five days of you receiving this letter I shall assume you do not object to the document/s being released. Please contact me on 02 4732 7732 or email [jsheward@penrithcity.nsw.gov.au](mailto:jsheward@penrithcity.nsw.gov.au) if you would like further information.

Yours faithfully 

Jackie Shephard  
**Right to Information Officer**

**Encl**

Penrith City Council  
PO Box 60, Penrith  
NSW 2751 Australia  
T 4732 7777  
F 4732 7958  
[penrithcity.nsw.gov.au](http://penrithcity.nsw.gov.au)

**Golder Associates Pty Ltd** A.C.N. 006 107 857  
WESTERN SYDNEY OFFICE

Unit 1, 20 Garling Road, Kings Park, NSW 2148 Australia  
(PO Box 6027, Blacktown, NSW 2148 Australia)  
Telephone (02) 9831 7194  
Fax (02) 9831 7224



REPORT ON

**REMEDIATION AND VALIDATION  
AREAS 1 & 2  
65 – 87 DUNHEVED CIRCUIT  
ST MARYS NSW**

Submitted to  
Maganic Brothers & Sister Pty Ltd  
30 Glendenning Road  
GLENDENNING NSW

**DISTRIBUTION:**

1 Copy            Maganic Brothers & Sister Pty Ltd  
2 Copies         Golder Associates Pty Ltd

December 1998

97623169/A

If a Minister or the principal officer of an agency made the decision, you cannot ask for an internal review, but you can ask for an external review (see below).

There is a \$40 fee for an internal review application.

This fee is not payable (by the person who applied for a review with the Information Commissioner) where an internal review is recommended by the Information Commissioner under section 93(6).

The agency must acknowledge your application within five working days of receiving it. The agency must decide the internal review within 15 working days (this can be extended by 10 working days if the agency has to consult further, or by agreement with you).

## 2. External review by the Information Commissioner

If you disagree with the outcome of the internal review, you can ask for a review by the Information Commissioner.

You must seek an internal review before applying for review by the Information Commissioner, unless an internal review is otherwise unavailable (for instance, if the principal officer of the agency decided the application or if the agency is a Minister).

You have **40 working days** from the date of the decision of an internal review to ask for a review by the Information Commissioner.

On reviewing the decision, the Information Commissioner can make recommendations about the decision to the agency.

*Note: You cannot ask the Information Commissioner to review a decision that has already been reviewed by the NSW Civil and Administrative Tribunal.*

## 3. External review by the NSW Civil and Administrative Tribunal

If you disagree with either of the decisions listed above, you can ask for a review by the NSW Civil and Administrative Tribunal (NCAT). You do not have to have the decision reviewed internally, or by the Information Commissioner, before applying for review by the NCAT.

You have **40 working days** from the date of the decision to apply to the NCAT for review. However, if you have applied for review by the Information Commissioner, you have **20 working days** from the date you are notified that the Information Commissioner's review is completed, to apply to the NCAT.

The agency cannot from release the information until you have exhausted all your review rights.

You should also be aware that if the agency agrees with you and denies access to the information, then the GIPA Applicant has similar review rights. Fees and charges apply to these review processes.

## If the agency discloses the information, can they publish the information on their disclosure log?

An agency may decide to publish information released in their disclosure log because it may of interest to other members of the public.

If the agency is considering publishing the information you've been consulted about, the agency must notify you in writing:

- that the information will be included in the agency's disclosure log and that you can object to this,
- that you have a right to request a review of the decision to include information in its disclosure log despite your objection.

You would then have the same review rights as discussed above, and the agency cannot publish the information until the period for seeking a review has expired or any review itself is finalised.

## For more information

Contact the Information and Privacy Commission:

freecall: 1800 472 679

email: [ipcinfo@ipc.nsw.gov.au](mailto:ipcinfo@ipc.nsw.gov.au)

website: [www.ipc.nsw.gov.au](http://www.ipc.nsw.gov.au)

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## EXECUTIVE SUMMARY

The remediation of two areas (Area 1 and Area 2) was carried out at an industrial site located at 65-87 Dunheved Circuit, St Marys, NSW. These areas were identified following two stages of a contamination investigation of the site. The remediation and validation carried out is summarised below. The remediation was considered to be 'Category 2 remediation work' under the DUAP Planning Guidelines (SEPP 55 - Remediation of Land), however, as the work was carried out before the introduction of the guidelines, no Council approval was required.

- Area 1 was found to contain heavy metals and hydrocarbons at concentrations that exceeded the criteria for industrial use of the site. The remediation of this area consisted of excavation and segregation of the contaminated soil, followed by treatment and subsequent disposal to an approved landfill. The area excavated was about 150 m<sup>2</sup> laterally and about 0.25 m deep. The contaminated soil was disposed of to a licensed landfill in accordance with a Consent for disposal issued by the NSW EPA. The residual soils in the excavation and those retained on site after segregation were sampled and analysed. The results were below the adopted criteria for industrial use of the site.
- Area 2 was located south east of a former building and contained three 5000 litre underground storage tanks (USTs). After removal of the USTs by the owner of the site, the residual soil in the excavation (walls and base) and a stockpile of soil which was excavated from around the USTs was sampled. Selected samples were analysed for the contaminants of concern consisting of total petroleum hydrocarbons (TPH), monocyclic aromatic hydrocarbons (BTEX) and lead. The results were below the NSW EPA criteria for industrial use of the site.
- The excavations were backfilled by the owner of the site with soils retained on the site and natural material excavated from other parts of the site.

The overall results of the remediation and validation indicate that the likelihood of hydrocarbon and heavy metal contamination in the residual soils in the areas remediated are considered to be low and based on the results, these areas are considered acceptable for ongoing industrial use.

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Drawing 723169/3	Sampling Locations - Area 1
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## 1. INTRODUCTION

This report presents the results of the remediation and validation carried at a site located at 65 - 87 Dunheved Circuit, St Marys NSW. Golder Associates was commissioned to carry out this work by Mr Edmond Kelly of Maganic Brothers and Sister Pty Ltd following our proposals P972207.A dated 23 June 1997 and P972302.A dated 25 August 1997.

The site is located in a predominantly industrial area of St Marys, NSW and has an area of about 8 hectares. The site has been used for industrial purposes in the past and is proposed to be redeveloped for continued industrial use.

The site is bounded by industrial properties to the north and south, Dunheved Circuit to the east and a disused railway line and a golf course to the west. The site location is presented in Drawing 7623169/1 and a site plan is shown on Drawing 7623169/2. More information on the site is contained in previous reports (Reference 1, 2).

A preliminary environmental assessment of the site was carried out by Otek Australia Pty Ltd in November 1996 (Reference 1). The Otek report identified some areas of potential ground contamination based on the site history and a site inspection. Subsequently, Golder Associates carried out a more extensive investigation (Reference 2) primarily involving a soil sampling and analysis program across the site.

Based on the results of the previous investigations, two areas of the site were identified for remediation. These areas have been designated Area 1 and Area 2 for the purpose of this report.

- *Area 1:* This area was west of a former building (Drawing 723169/2) and was found to contain concentrations of heavy metals and hydrocarbons in the near surface soils, which exceeded the criteria for industrial use of the site. Based on the field observations and results of laboratory analysis, the area was assessed as being about 150 m<sup>2</sup> laterally and 0.3m to 0.5 m deep.
  
- *Area 2:* This area was located south east of a former building and contained three 5000 litre underground storage tanks (USTs). The tanks are believed to have been used for fuel storage during the former use of the site by APS Plastics Pty Ltd. Although the results of a sampling and analysis carried out in this area during the investigation stage

were below the adopted NSW EPA criteria, with the hydrocarbon concentrations below laboratory detection limits, the tanks were recommended to be removed and the residual soils validated prior to development of the site.

## 2. SCOPE OF WORK

The scope of work for the remediation consisted of project management of the following tasks:

### *Area 1*

- Excavation of the contaminated soil;
- Validation sampling and analysis of the residual soil in the excavation;
- Characterisation of the excavated soil for the purposes of off-site disposal;
- Treatment of the contaminated soil prior to disposal;
- Obtaining a NSW EPA consent for the disposal of the soil to a licensed landfill; and
- Preparing this report on the remediation and validation.

### *Area 2*

- Validation sampling and analysis of the walls and base of the excavation after removal of the USTs;
- Validation sampling and analysis of a stockpile of soil excavated from around the USTs;
- Interpretation of the results of the sampling and analysis by comparison with NSW EPA criteria, and
- Preparation of this remediation and validation report.

The owner of the site carried out all earthworks. Golder Associates was responsible for the project management aspects of the remediation including assessment of the extent of excavation, classification of the soil prior to disposal and liaison with the NSW EPA.

The backfilling of the excavations in Areas 1 and 2 was not within the scope of work and was carried out by the owner. This aspect has been briefly discussed in Sections 4.1.5 and 4.2.3 of this report.

### 3. GENERAL METHODOLOGY

The remediation work was carried out in accordance with standard procedures adopted by Golder Associates. This included field screening of samples using a photoionisation detector (PID), laboratory analysis by NATA registered laboratories and use of appropriate health and safety requirements.

Where applicable, the extent of the excavation of contaminated soil was assessed based on:

- The results of laboratory analysis of the delineation samples,
- visual and odour observations, and
- field screening of samples using a photoionisation detector

Some of these issues are discussed in more detail in the following sections

#### 3.1 PHOTOIONISATION DETECTOR (PID) SCREENING

Screening of samples was carried out using a photoionisation detector (PID). The PID is a useful instrument for the detection of ionisable compounds such as volatile hydrocarbons. The technique is used in conjunction with visual observations and odour to identify the presence of hydrocarbon contamination and to select samples for laboratory analysis. In the present case, the PID was extensively used to screen samples of the excavated material and collection of validation samples from the faces of the pit after excavation

The screening procedure involved collection of samples in duplicate. The primary sample was screened using the PID and the duplicate was preserved for selection of samples for laboratory analysis. More information on the PID is presented in Appendix A.

#### 3.2 LABORATORY ANALYSIS

Analysis was performed by Australian Environmental Laboratories (AEL) and Sydney Analytical Laboratories (SAL). Both laboratories are registered by the National Association of Testing Authorities (NATA) for the tests performed.

Laboratory certificates which include the analytical methods employed are presented in Appendix B. A summary table of analysis carried out is presented in Table 1.

### 3.3 HEALTH AND SAFETY

All field work was carried out in accordance with Golder Associates standards health and safety procedures. This included the use of appropriate personal protective equipment (PPE), covering stockpiles prior to disposal to prevent the formation of leachate and sediment control during excavation.

### 3.4 REMEDIATION CRITERIA

#### *Soils Retained on Site*

The results of laboratory analysis were interpreted by comparison with criteria recommended by the NSW EPA. The results for hydrocarbons were compared with NSW EPA criteria for assessing service station sites (Reference 3). In the case of heavy metals, the NEHF (F) criteria recommended by the NSW EPA's Site Auditor Scheme (Reference 4) for industrial sites were used. The relevant criteria are presented in the summary tables of analytical results (Tables 2,3,4).

#### *Soils Disposed of Site*

The results of laboratory analysis for the purpose of off-site disposal of soil were interpreted by comparison with the criteria published by the NSW EPA for the Assessment Classification and Management of Non Liquid Waste (Reference 5). The criteria are presented in the summary table of analytical results (Tables 5,6).

Based on the guidelines, once soil is excavated, it is considered waste and is required to be classified into one of four categories by comparison with threshold values established for the contaminants of concern. These classifications are Inert, Solid, Industrial and Hazardous waste. In the case of Inert waste, a generator does not need to notify the NSW EPA of transport or disposal location. For Solid or Industrial waste, a generator is required to obtain NSW EPA approval to transport and dispose of the waste. In the case of Hazardous waste, the generator must notify the NSW EPA and either store the waste or treat it using appropriate immobilisation techniques prior to disposal. Currently, it is possible to dispose of waste, which is classified as Inert or Solid to a licensed landfill in the Sydney Metropolitan region.

To aid with the classification of waste, leachate testing (Toxicity Characteristic Leaching Test, TCLP) is normally carried out to assess the leachable concentrations of the contaminants of

concern. If the results of the leachate testing are below specified criteria, higher threshold values of contaminants in the soil are then used which may result in waste classified as Industrial or Hazardous being re-classified as either Inert or Solid waste for the purpose of disposal.

If the concentrations of the contaminant in the soil and in the leachate are above the specified value for classification of the waste to enable disposal to a licensed landfill, immobilisation of the contaminant is required in accordance with a procedure approved by the NSW EPA. The waste is then reclassified based on the results of leachate tests, after the immobilisation is completed, and may be disposed of to a landfill in accordance with NSW EPA approval.

In the present case a section of the soil excavated from Area 1 was classified as hazardous with respect to lead. The soil was treated for immobilisation in accordance with approval of the NSW EPA prior to disposal. These aspects are discussed in Section 4.1.4 of this report.

#### **4. REMEDIATION AND VALIDATION**

##### **4.1 AREA 1 – SOILS CONTAMINATED WITH HEAVY METALS AND HYDROCARBONS.**

Area 1 was located west of the former APS Plastics building (Drawing 723169/2). Two samples TP34 (0.0-0.2m) and TP7 (0.0-0.2) from this area were found to contain concentrations (Table 5) of copper, lead, zinc, and cadmium above the NEHF (F) criteria (Reference 4) for industrial use of the site. The results of samples analysed at depth indicated that the elevated concentrations were restricted to the near surface.

In addition, a sample from TP34 (0.0-0.2m) in this area was found to contain total petroleum hydrocarbons (TPH) at concentrations of 22,800 mg/kg in the C<sub>10</sub>-C<sub>36</sub> fraction (Table 6). The area from which this sample was collected was observed to have oil staining and was about 3 m x 4 m.

##### **4.1.1 Excavation**

The area was excavated and the soil stockpiled in a designated area of the site. The extent of the excavation was assessed based on visual and odour observations and PID screening as discussed in Section 3.0.

The area excavated was about 150 m<sup>2</sup> (Drawing 723169/3) with an average depth of 0.25 m. The soil excavated generally consisted of a layer (0.1m) of topsoil overlying fill, which was predominantly shaley clay.

#### 4.1.2 Validation of Excavation

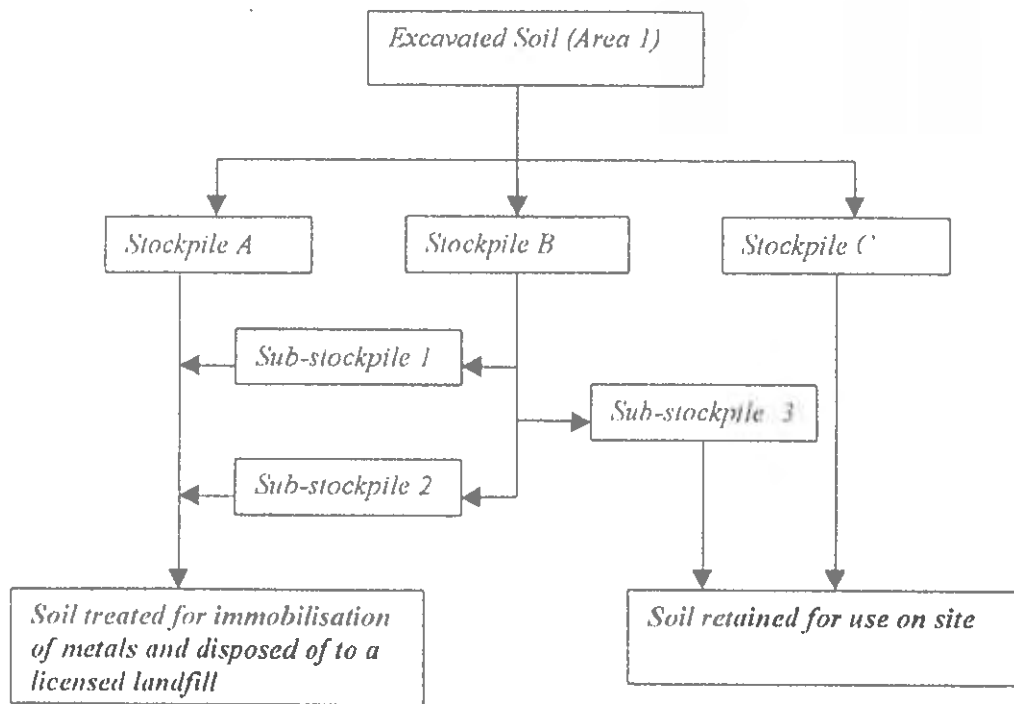
Samples were collected in duplicate from the walls and the base of the excavation. The primary sample was inspected and screened using a PID, and the duplicate sample preserved for selection of samples for laboratory analysis. The duplicate sample with the highest PID from each of the faces of the excavation was selected for laboratory analysis. The sampling locations are shown on Drawing 723169/3.

Six samples WW, WN, WE, WS, B1, and B2 were analysed for a range of heavy metals and TPH fractions. The results are summarised in Table 2 and 3. The results for heavy metals were below the NEHF (F) criteria. The results for hydrocarbons were also below the NSW EPA criteria and below laboratory detection limits. The results are consistent with the absence of odour, discolouration and the low PID readings obtained.

The overall results indicated that the affected soil in this area had been removed.

#### 4.1.3 Excavated Soil

Based on visual observations, odour and further sampling and analysis, the excavated soil was segregated into stockpiles according to those that could be retained on site and those that needed to be disposed off-site. The management of the excavated soil is presented in Figure 1 below.



*Figure 1 Management of Excavated Soil*

#### *Stockpile A*

Stockpile A consisted of about 6 m<sup>3</sup> of soil from around TP34. This soil was found to have concentrations of hydrocarbons and heavy metals that exceeded the criteria for an industrial site.

Two samples, SP 34 (S1) and SP34 (S2) from Stockpile A were collected for analysis of heavy metals and hydrocarbons (TPH). The concentrations of TPH (Table 6) were 1630 mg/kg in SP34 (S1) and below laboratory detection limits in SP34 (S2). Based on these results the waste was classified as Inert waste with respect to hydrocarbons for the purpose of off site disposal (Reference 5).

Based on the concentration of lead, the stockpile was classified hazardous waste (Table 5) Further treatment of the soil from this stockpile was then carried out to immobilise the lead prior to off site disposal. This is further discussed in Section 4.1.4

### *Stockpile B*

Stockpile B consisted of about 23 m<sup>3</sup> of soil, which was slightly discoloured in areas and was generally excavated from around TP7. A sample from this area was found to contain elevated concentrations of heavy metals during the investigation stage. There were also localised areas with a mild hydrocarbon odour during the excavation. For the purpose of segregating the contaminated soil, Stockpile B was divided into three sub-stockpiles as follows:

- The first sub-stockpile was designated Sub-stockpile 1 and had a relatively small volume (about 4 m<sup>3</sup>). Samples SP7 (S1) and SP7 (S2) were collected from this sub-stockpile and were found to have a mild hydrocarbon odour. The results of laboratory analysis indicated TPH concentrations (C<sub>10</sub> - C<sub>36</sub>) of 2740 mg/kg and 1990 mg/kg in SP7 (S1) and SP7 (S2) respectively. The soil was classified as Inert waste with respect to hydrocarbons. Based on the concentrations of metals in samples SP7(S1) and SP7 (S2), the soil was classified as Inert waste however, based on the concentration of lead in the in-situ sample (TP7) and the discolouration observed, the soil from this sub-stockpile was subsequently combined with that of Stockpile A for further treatment and off site disposal. This is further discussed in Section 4.1.4.
- The second sub-stockpile was designated Sub-stockpile 2 and was approximately 10 m<sup>3</sup>. The soil had no apparent discolouration or odour. One sample SP7(S3) was collected from this sub-stockpile for analysis of hydrocarbons (TPH) and heavy metals (Table 2.3). The concentrations were below detection limits and below the criteria for TPH. The concentrations of heavy metals were also below the criteria. Based on these observations and results of laboratory analysis, the sub-stockpile was retained for use on the site.
- The third sub-stockpile was designated Sub-stockpile 3 and was estimated to be about 9 m<sup>3</sup>. The soil was discoloured. One sample SP7(4) was collected for analysis of TPH and heavy metals. The results of laboratory analysis (Table 5, 6) indicated a concentration of 2224 mg/kg for TPH in the C<sub>10</sub> - C<sub>36</sub> fraction and the soil was classified as Inert waste with respect to hydrocarbons. However, based on the concentration of lead, the soil was classified as Industrial waste. Subsequent analysis of additional samples SP7/1 to SP7/6 to further characterise the soil resulted in the soil being classified as Hazardous waste (Table 5). Based on the results, this sub-stockpile was subsequently combined with that of Stockpile A for further treatment to immobilise the lead prior to off site disposal. This is further discussed in Section 4.1.4.

### *Stockpile C*

Stockpile C consisted of the remaining soil (about 8 m<sup>3</sup>) which was not discoloured and did not have an odour during the excavation

The sample from this stockpile SP (C) had a concentration of 437 mg/kg TPH in the C<sub>10</sub>-C<sub>36</sub> fraction which was below the NSW EPA criteria of 1000 mg/kg (Table 4). Further, the concentrations of metals were well below the adopted NEHF (F) criteria (Table 3). Based on these results, the soil was retained for use on the site

#### **4.1.4 Treatment and Disposal of Contaminated Soil**

##### *Immobilisation of lead*

Based on the results of laboratory analysis and the subsequent leachate tests, the soil from Stockpile A and Stockpile B (Sub-stockpiles 1 and 3) were treated for immobilisation of lead for the purpose of disposal to a landfill

A series of bench scale trial tests for the immobilisation were carried out. The tests consisted of treating the soil with varying quantities of lime, cement and fly ash. The mixture was allowed to cure and samples collected for laboratory analysis to assess the concentration of lead in the leachate. The optimum concentration arrived at was the addition of 30 % (10% lime, 10 % fly ash and 10 % cement) of the immobilisation mixture to the soil. The concentration of lead in the leachate on a sample after curing the mixture was 4.1 mg/L (Table 7). As a measure of precaution, leachate tests were also carried out for cadmium and nickel in this sample. The concentrations were below laboratory detection limits.

Based on concentration of lead in the leachate of the treated sample, the NSW EPA granted a Consent for the treatment and disposal of the waste to licensed landfill

##### *Disposal of Treated Soil*

The soil to be disposed of was treated as discussed above. After the treatment, leachate concentrations of lead in two samples (AT1 and AT2) were 1.3 mg/L and 1.4 mg/L (Table 7) which confirmed the results of the bench scale trial test and the classification of the waste as Solid. Subsequently, after the treated material was allowed to dry out, it was disposed of to a

licensed landfill (Envrioguard Pty Ltd) by the owner of the site. The weighbridge docket obtained are presented in Appendix C.

#### 4.1.5 Backfilling of Excavation

According to the owner, the excavation was backfilled with natural material excavated from some elevated areas on the other parts of the site. No compaction tests were carried out as the excavation was relatively shallow.

#### 4.2 AREA 2 – (UNDERGROUND STORAGE TANK AREA)

The USTs were located in an area south east of the former APS Plastics Pty Ltd (Drawing 723169/2). The results of the samples collected in the area around the USTs during the investigation did not indicate the presence of elevated concentrations of the contaminants of concern. However, after the USTs were removed and disposed of by the owner of the site, the walls and the base of the excavation were sampled to ensure that the residual soils did not contain elevated concentrations of the contaminants of concern.

In addition, a sample from the stockpiled soil was also collected for laboratory analysis.

##### 4.2.1 Sampling

Prior to sampling, the dimensions of the excavation were about 6 m x 6 m and about 2 m deep. Samples were collected from each of the walls and the base of the excavation and from the stockpiled soil. All samples were collected in duplicate. The primary samples were screened using a photoionisation detector (PID) and the duplicate sample was preserved for selection of samples for laboratory analysis. The PID readings were generally low with the maximum concentration was 7.8 ppm (Table 4). The sampling locations are shown on Drawing 723169/4.

##### 4.2.2 Laboratory Analysis

Five samples were analysed for total petroleum hydrocarbons (TPH), monocyclic aromatic hydrocarbons (BTEX) and lead. The samples for laboratory analysis were selected based on visual observations, odour and results of PID screening.

The laboratory samples consisted of

- 
- One sample from each of the walls and base of the excavation (N2, S4, E3, W3, B2 and B4);
  - One sample from the stockpiled material which was used to supplement the results of the soil sampling carried out during the investigation of this area; and
  - One duplicate sample for the purposes of quality control.

The analytical program is presented in Table 1.

#### 4.2.3 Results

The results of laboratory analysis were assessed by comparing the concentrations reported with criteria recommended by the NSW EPA (Reference 3) as discussed in Section 3.4. The results are summarised in Table 4 and laboratory certificates are presented in Appendix B.

##### *Excavation*

The results of laboratory analysis were below detection limits and below the criteria for TPH and BTEX. The results for lead were below laboratory detection limits except for sample E3 in which the concentration was 5.4 mg/kg, which is well below the criteria of 300 mg/kg.

##### *Stockpile*

The results of the sample collected from the stockpile were below laboratory detection limits for all the parameters for which the sample was analysed. The results confirm those obtained from the soil samples collected from this area during the investigation in which the concentrations were well below the NSW EPA criteria (Reference 3).

##### *Backfilling*

According to the owner, the excavation was backfilled with natural material excavated from some elevated areas on other parts of the site. Compaction tests were not part of the scope of work and were not carried out after the backfilling.

## 5. QUALITY ASSURANCE / QUALITY CONTROL

The fieldwork for this remediation was carried out in accordance with Golder Associates standard procedures. This included collection of samples in new glass jars, preservation of

samples in ice chests and transport of samples to the contract laboratory under chain of custody documentation.

Three pairs of duplicate samples were collected to assess laboratory precision (Table 8)

- Samples WE and WE (D) were duplicate pairs collected from the eastern wall of the excavation in Area 1 and were analysed for heavy metals.
- Samples WW and WW (D) were duplicate pairs collected for from the northern wall of the excavation in Area 1 and were analysed for TPH.
- Samples B4 and B4/D were duplicate pairs collected from the base of the excavation in Area 2 and were analysed for TPH, BTEX and lead.

The results are normally assessed by calculating the relative percent difference (RPD) values between the primary and duplicate. An RPD value of 0% indicates perfect agreement between results, whilst an RPD value of 200% reflects total disagreement between results

In the case of duplicates WE / WE(D) the maximum RPD for heavy metals was 16.2% for zinc which is well below the targeted RPD value of 50%.

The results for hydrocarbons in both pairs of duplicates were below laboratory detection limits and hence the RPD values could not be calculated. However, the results theoretically indicate an acceptable level of agreement between the primary and duplicate samples

No equipment blanks were generated as the samples were collected from the centre of the excavator bucket during sampling

The internal laboratory QA/QC results are presented with the laboratory certificates (Appendix B) and are considered acceptable based on the duplicate and control samples analysed

## 6. CONCLUSIONS

The remediation of two areas (Area 1 and Area 2) were carried out at an industrial site located at 65 - 87 Dunheved Circuit, St Marys, NSW. These areas were identified following two stages of a contamination investigation of the site.

- Area 1 was found to contain concentrations of heavy metals and hydrocarbons that exceeded the criteria for industrial use of the site. The remediation consisted of excavation and segregation of the contaminated soil, followed by treatment and subsequent disposal to an approved landfill. The area excavated was about 150 m<sup>2</sup> laterally and about 0.25 m deep. The contaminated soil was disposed of to a licensed landfill in accordance with a Consent for disposal issued by the NSW EPA. The residual soils in the excavation and those retained on site after segregation were sampled and analysed. The results were below the adopted criteria for industrial use of the site.
  
- Area 2 was located south east of a former building and contained three 5000 litre underground storage tanks (USTs). After removal of the USTs by the owner of the site, the residual soil in the excavation (walls and base) and a stockpile of soil which was excavated from around the USTs was sampled. Selected samples were analysed for the contaminants of concern consisting of total petroleum hydrocarbons (TPH), monocyclic aromatic hydrocarbons (BTEX) and lead. The results were below the NSW EPA criteria for industrial use of the site.
  
- The excavations were backfilled by the owner of the site with soils retained on the site and natural material excavated from other parts of the site.

The overall results of the remediation and validation indicate that the likelihood of hydrocarbon and heavy metal contamination in the residual soils in the areas remediated are considered to be low and based on the results, these areas are considered acceptable for ongoing industrial use.

## 7. LIMITATIONS

This report has been prepared for a limited purpose and for a specific client. Golder Associates does not accept any responsibility arising from the use of the information and interpretation of the results for any other purpose or by any other party.

Attached as Appendix D is a document entitled "Important Information About Your Environmental Site Assessment" which details important additional limitations regarding the work undertaken and this report.

**GOLDER ASSOCIATES PTY LTD**



Dr Chris Farias MRACI C Chem  
Senior Environmental Scientist

**REFERENCES**

1. *Background Investigation (Potential Contaminants), Otek Australia Pty Ltd Report No S96C130 November 1996.*
2. *Stage 2 Contamination Investigation, 65 - 87 Dunheved Circuit, St Marys; Golder Associates report No. 97623111.A. August 1997.*
3. *Guidelines for Assessing Service Station Site, NSW EPA December 1994*
4. *Guidelines for the NSW Site Auditor Scheme, NSW EPA June 1998.*
5. *Environmental Guidelines. Assessment, Classification and Management of Non-Liquid Wastes NSW EPA, July 1997.*

Area	Sample ID	Sample Date	Sample Type	Sample Depth (m)	Analysis		
<b>Area 1 - Validation of Excavation</b>							
West wall	WW	28.8.97	Soil	0.2	Metals	TPH	
North Wall	WN	28.8.97	Soil	0.2	Metals	TPH	
East Wall	WE	28.8.97	Soil	0.2	Metals	TPH	
South wall	WS	28.8.97	Soil	0.1	Metals	TPH	
Base	B1	28.8.97	Soil	0.2	Metals	TPH	
Base	B2	28.8.97	Soil	0.2	Metals	TPH	
Duplicate	WW(D)	28.8.97	Soil	0.2			
Duplicate	WE(D)	28.8.97	Soil	0.2	Metals	TPH	
<b>Area 1 - Excavated Soil</b>							
Stockpile A	SP34 (S1)	28.8.97	Soil	Stockpile	Metals	TPH	
	SP34(S2)	28.8.97	Soil	Stockpile	Metals	TPH	TCLP
	TP34	23.5.97	Soil	0.2	Metals	TPH	TCLP
Stockpile B	SP7(S1)	28.8.97	Soil	Stockpile	Metals	TPH	
	SP7(S2)	28.8.97	Soil	Stockpile	Metals	TPH	
	SP7(S3)	28.8.97	Soil	Stockpile	Metals	TPH	
	SP7(S4)	28.8.97	Soil	Stockpile	Metals	TPH	TCLP
	SP7/1	11.9.97	Soil	Stockpile	Cu, Pb, Zn		
	SP7/2	11.9.97	Soil	Stockpile	Cu, Pb, Zn		
	SP7/3	11.9.97	Soil	Stockpile	Cu, Pb, Zn		
	SP7/4	11.9.97	Soil	Stockpile	Cu, Pb, Zn		
	SP7/5	11.9.97	Soil	Stockpile	Cu, Pb, Zn		
	SP7/6	11.9.97	Soil	Stockpile	Cu, Pb, Zn		
TP7	23.5.97	Soil	0.2	Metals	TPH	TCLP	
Stockpile C	SP C	28.8.97	Soil	Stockpile	Metals	TPH	

TABLE 1 (1 of 2)  
ANALYTICAL PROGRAM

Maple River & Time Pty Ltd  
Identification and Validation  
Dated 17/06/98 at 14:57





Area	Sample ID	Sample Date	Sample Type	Sample Depth (m)	Analysis		
<b>Leachate tests after Immobilisation of Lead</b>							
Bench Scale	Mix E	22.4.98	Mixture	-	TCLP		
Field Sample	AT1	12.6.98	Mixture	-	TCLP		
Field Sample	AT2	12.6.98	Mixture	-	TCLP		
<b>Area 2 - Excavation</b>							
North wall	N2	24.6.97	Soil	2	TPH	BTEX	Lead
South wall	S4	24.6.97	Soil	2.5	TPH	BTEX	Lead
East wall	E3	24.6.97	Soil	2.5	TPH	BTEX	Lead
West wall	W3	24.6.97	Soil	2.5	TPH	BTEX	Lead
Base	B2	24.6.97	Soil	3	TPH	BTEX	Lead
Base	B4	24.6.97	Soil	3	TPH	BTEX	Lead
Duplicate	B4 (D)	24.6.97	Soil	3	TPH	BTEX	Lead
<b>Area 2 Stockpile</b>	Stockpile	24.6.97	Soil	-	TPH	BTEX	Lead



**TABLE 1 (2 of 2)**  
**ANALYTICAL PROGRAM**

Maganic Brothers & Sister Pty Ltd  
Remediation and Validation  
Dunheved Circuit, St Mary's

Sample ID	Sample Depth	PID	C <sub>6</sub> -C <sub>9</sub>	C <sub>10</sub> -C <sub>14</sub>	C <sub>15</sub> -C <sub>28</sub>	C <sub>29</sub> -C <sub>36</sub>	Total C <sub>10</sub> -C <sub>36</sub>
<b>Validation of Excavation - Area 1</b>							
WW	0.2	8.2	< 20	< 20	< 50	< 50	ND
WN	0.1	19.4	< 20	< 20	< 50	< 50	ND
WW (D)	0.1		< 20	< 20	< 50	< 50	ND
WE	0.2	11.6	< 20	< 20	< 50	< 50	ND
WS	0.1	9.4	< 20	< 20	< 50	< 50	ND
B1	0.3	11	< 20	< 20	< 50	< 50	ND
B2	0.3	12.3	< 20	< 20	< 50	< 50	ND
<b>Soil retained on site</b>							
SPC		2	< 20	57	240	140	437
SP7(3)		14	< 20	< 20	< 50	< 50	ND
<b>NSW EPA</b>			<b>65</b>				<b>1000</b>

**Notes**

All results are expressed as mg/kg

Figures in bold italics exceed the NSW EPA criteria

PID calibrated with 99 ppm isobutylene



**TABLE 2**  
**SUMMARY OF ANALYTICAL RESULTS**  
**Area 1 - Excavation**  
**Total Petroleum Hydrocarbons**

Maganic Brothers & Sister Pty Ltd  
 Remediation and Validation  
 Dunbeved Circuit, St Mary's

Sample ID	Sample Depth	Cu	Pb	Zn	Cr	Cr	As	Hg
<b>Validation of Excavation - Area A</b>								
WW	0.2	12	16	14	< 0.5	8	4.5	0.060
WN	0.1	38	29	51	< 0.5	7.5	5.5	0.110
WE	0.2	22	25	17	< 0.5	9	5	0.050
WE(D)	0.2	20	29	20	< 0.5	8.5	4.5	0.060
WS	0.1	23	44	23	< 0.5	9	6	0.025
B1	0.3	8	18	36	< 0.5	11	5	0.015
B2	0.3	45	39	53	< 0.5	9	5	0.310
<b>Soil retained on site</b>								
SPC	Stockpile	400	370	410	2.5	12	5.5	0.030
SP7(S3)	Stockpile	84	90	90	0.5	9	5	0.190
<b>NEHF (F) Criteria</b>		<b>5000</b>	<b>1500</b>	<b>35000</b>	<b>100</b>	<b>500</b>	<b>500</b>	<b>75</b>

Notes

All results are expressed as mg/kg

Figures in bold italics exceed the criteria



**TABLE 3**  
**Summary of Analytical Results**  
**Area 1 Excavation - Heavy Metals**

Maganic Brothers & Sister Pty Ltd  
 Remediation and Validation  
 Dunbeved Circuit, St Mary's

Sample ID	Sample Depth	PID	C <sub>6</sub> -C <sub>8</sub>	C <sub>10</sub> -C <sub>14</sub>	C <sub>15</sub> -C <sub>20</sub>	C <sub>21</sub> -C <sub>36</sub>	Total C <sub>10</sub> -C <sub>36</sub>	Benzene	Toluene	Ethyl Benzene	Xylene	Lead
Validation - UST Area												
N2	2	5.9	< 20	< 20	< 50	< 50	ND	< 0.5	< 0.5	< 0.5	< 1.5	< 0.5
S4	2.5	4.6	< 20	< 20	< 50	< 50	ND	< 0.5	< 0.5	< 0.5	< 1.5	< 0.5
E3	2.5	4.9	< 20	< 20	< 50	< 50	ND	< 0.5	< 0.5	< 0.5	< 1.5	< 0.5
W3	2.5	3.6	< 20	< 20	< 50	< 50	ND	< 0.5	< 0.5	< 0.5	< 1.5	< 0.5
B2	3	6.5	< 20	< 20	< 50	< 50	ND	< 0.5	< 0.5	< 0.5	< 1.5	< 0.5
B4	3	7.8	< 20	< 20	< 50	< 50	ND	< 0.5	< 0.5	< 0.5	< 1.5	< 0.5
B4(D)	3	-	< 20	< 20	< 50	< 50	ND	< 0.5	< 0.5	< 0.5	< 1.5	< 0.5
Stockpile	N/A	0	< 20	57	240	140	437	< 0.5	< 0.5	< 0.5	< 1.5	< 0.5
NSW EPA			65				1000	1	1.4	3.1	14	300

Notes

All results are expressed as mg/kg

Figures in bold italics exceed the NSW EPA criteria

PID calibrated with 99 ppm isobutylene

TABLE 4

**SUMMARY OF ANALYTICAL RESULTS**  
**Area 2 Validation Sampling and Analysis**  
**Total petroleum Hydrocarbons**  
**Monocyclic Aromatic Hydrocarbons**  
**Lead**

Maganic Brothers & Sister Pty Ltd  
Remediation and Validation  
Dunheved Circuit, St Mary s



Sample ID	Sample Depth	Cu	Pb	Zn	Mn	Cr	As	Hg
<b>In situ sampling</b>								
TP34	Stockpile A	20.103	4.703	11.403	10	22	9.5	0.35
TP34	TCLP Test	175	210	540				
Classification		Hazardous			Solid	Solid	Inert	Inert
<b>After Excavation</b>								
SP24 (S1)	Stockpile A	940	620	850	3.5	22	7.5	0.025
SP34 (S2)	Stockpile A	6000	6150	4250	1.5	24	10	0.025
SP24 (S2)	TCLP Test	13.2	17.9	60.8	<0.01	<0.01		
Classification		Hazardous			Solid	Solid	Inert	Inert

**Classification Criteria Without TCLP**

		Copper	Lead	Zinc	Cadmium	Chromium	Arsenic	Mercury
CT1	Inert	-	10	-	2	10	10	0.4
C12	Solid	-	100	-	20	100	100	4
C13	Industrial	-	400	-	80	400	400	15

**Classification Criteria With TCLP**

		Copper	Lead	Zinc	Cadmium	Chromium	Arsenic	Mercury
TCLP	Inert	-	0.5	-	0.1	0.5	0.5	0.02
SCC4	Inert	-	1500	-	100	1900	500	50
TCLP	Solid	-	5	-	1.0	5	5	0.2
SCC2	Solid	-	1500	-	100	1900	500	50
TCLP	Industrial	-	20	-	4.0	20	20	0.8
SCC3	Industrial	-	6000	-	400	7600	2600	200

Note:

Toxic mg/kg for soils, mg/l. for TCLP tests

TCLP - Toxicity Characteristic Leaching Tests



**TABLE 5 (1 of 3)**  
**Summary of Analytical Results**  
**Area 1 Stockpile A**  
**Heavy Metals**

Maganic Brothers & Sister Pty Ltd  
 Remediation and Validation  
 Dunbeved Circuit, St Mary's

Sample ID	Sample Depth	Cu	Pb	Zn	Cr	As	Hg
<b>Before Sampling</b>							
BT7	0.2	6250	2600	5300	111		
BT7	TCLP	21.3	21.8	72.9	1		
Classification		Hazardous		Industrial			
<b>After Extraction</b>							
SP7(S1)	Stockpile B	140	290	250	7	24	0.02
SP7(S2)	Stockpile B	17	17	33	<0.5	33	0.021
SP7(S3)	Stockpile B	84	90	90	0.5	9	0.13
SP7(S4)	Stockpile B	1000	4100	4400	153	140	0.21
SP7(S4)	TCLP	8.3	32.1	56.4	1.2	0.02	
Classification		Industrial		Industrial		Very	Low

**Classification Criteria Without TCLP**

		Copper	Lead	Zinc	Cadmium	Chromium	Arsenic	Mercury
U11	Level		10		2	10	30	0.3
U12	Soil		100		20	100	100	4
U13	Industrial		400		80	400	400	10

**Classification Criteria With TCLP**

		Copper	Lead	Zinc	Cadmium	Chromium	Arsenic	Mercury
TCLP	Inert	0.5			0.1	0.5	0.5	0.02
SCC1	Inert	1500			100	1900	500	50
TCLP	Soil	5			1.0	5	5	0.2
SCC2	Soil	1500			100	1900	500	50
TCLP	Industrial	20			4.0	20	20	0.8
SCC3	Industrial	6000			400	7000	2000	100

Notes  
 Units mg/kg or mg/L for TCLP  
 TCLP Toxicity Characteristic Leaching Tests

**TABLE 5 (2 of 3)**  
**Summary of Analytical Results**  
**Area 1 - Stockpile B**  
**Heavy Metals**

Magnolia Brothers & Sister Pty Ltd  
 Remediation and Validation  
 Duabed Circuit 3, Manly



Sample ID	Sample Depth	Cu	Pb	Zn
After Excavation (Cont)				
SP7/1	Stockpile B	980	1650	1000
SP7/2	Stockpile B	570	1090	570
SP7/3	Stockpile B	730	550	430
SP7/4	Stockpile B	1110	1460	1070
SP7/5	Stockpile B	850	870	570
SP7/6	Stockpile B	1850	2450	1730
Classification			Hazardous	

Classification Criteria Without TCLP				
		Copper	Lead	Zinc
CT1	Inert	-	10	-
CT2	Solid	-	100	-
CT3	Industrial	-	400	-

Classification Criteria With TCLP				
		Copper	Lead	Zinc
TCLP	Inert	-	0.5	-
SCC1	Inert	-	1500	-
TCLP	Solid	-	5	-
SCC2	Solid	-	1500	-
TCLP	Industrial	-	20	-
SCC3	Industrial	-	6000	-

Notes  
Units mg/kg for soils; mg/l for TCLP tests  
TCLP Toxicity Characteristic Leaching Tests



**TABLE 5 (3 of 3)**  
**Summary of Analytical Results**  
**Area 1 Stockpile B**  
**Heavy Metals**

Maganic Brothers & Sister Pty Ltd  
Remediation and Validation  
Dunbeved Circuit, St Mary's

Sample ID	Sample Depth	PFD	C <sub>1</sub> C <sub>2</sub>	C <sub>3</sub> C <sub>4</sub>	C <sub>5</sub> C <sub>6</sub>	C <sub>7</sub> C <sub>8</sub>	Total C <sub>1</sub> -C <sub>8</sub>	PAHs
<b>Stockpile A</b>								
<i>in-situ sampling</i>								
TP34	0.2	8.9	< 20	80	1100	1100	2280	5
Classification			Inert				Industrial	Inert
<i>After Excavation</i>								
SP34(S1)	Stockpile	27.6	< 20	< 20	950	880	1670	
SP34(S2)	Stockpile	4.3	< 20	< 20	< 50	< 50	ND	
Classification			Inert				Inert	
<b>Stockpile B</b>								
<i>in-situ sampling</i>								
TP7	0.2	1.6	< 20	< 20	< 30	< 30	ND	ND
Classification			Inert				Inert	Inert
<i>After Excavation</i>								
SP7(S1)	Stockpile	19.3	< 20	840	1900	< 50	2740	
SP7(S2)	Stockpile	18	< 20	890	1130	< 50	1990	
SP7(S3)	Stockpile	12.3	< 20	< 20	< 50	< 50	ND	
SP7(S4)	Stockpile	14.8	< 20	28	1300	900	2224	
Classification			Inert				Inert	
Inert			650				9,000	
Solid			650				10,000	
Industrial							40,000	

Notes

All results are expressed as mg/Lg

PFD calibrated with 99 ppm isobutylene



**TABLE 6**  
**SUMMARY OF ANALYTICAL RESULTS**  
**Area 1 Stockpiles A and B**  
**Total Petroleum Hydrocarbons**

Magade Brothers & Simer Pty Ltd  
 Remediation and Validation  
 Dundee Creek, St Mary's

Bench Trial		Pb	Cd	Ni
Mix E	TCLP	4.1	<0.01	<0.01
Treatment on Site				
AT1	TCLP	1.3	<0.01	<0.01
AT1	TCLP	1.4	<0.01	<0.01

Concentrations in mg/L



**TABLE 7**  
**SUMMARY OF ANALYTICAL RESULTS**  
**Leachate Tests (After Immobilisation)**

Maganic Brothers & Sister Pty Ltd  
 Remediation and Validation  
 Dunheved Circuit, St Mary's

Sample ID	Sample Depth	Cu	Pb	Zn	Co	Cr	As	Hg
WE	0.2	22	25	17	<0.5	9	5	0.050
WE(D)	0.2	20	29	20	<0.5	8.5	4.5	0.060
RPD		9.5	14.8	16.2		5.7	10.5	18.2

Sample ID	Depth	TPH	BTEX
WW	0.2	ND	
WW(D)	0.2	ND	
B4	Base	ND	ND
B4 (D)	Base	ND	ND

Notes

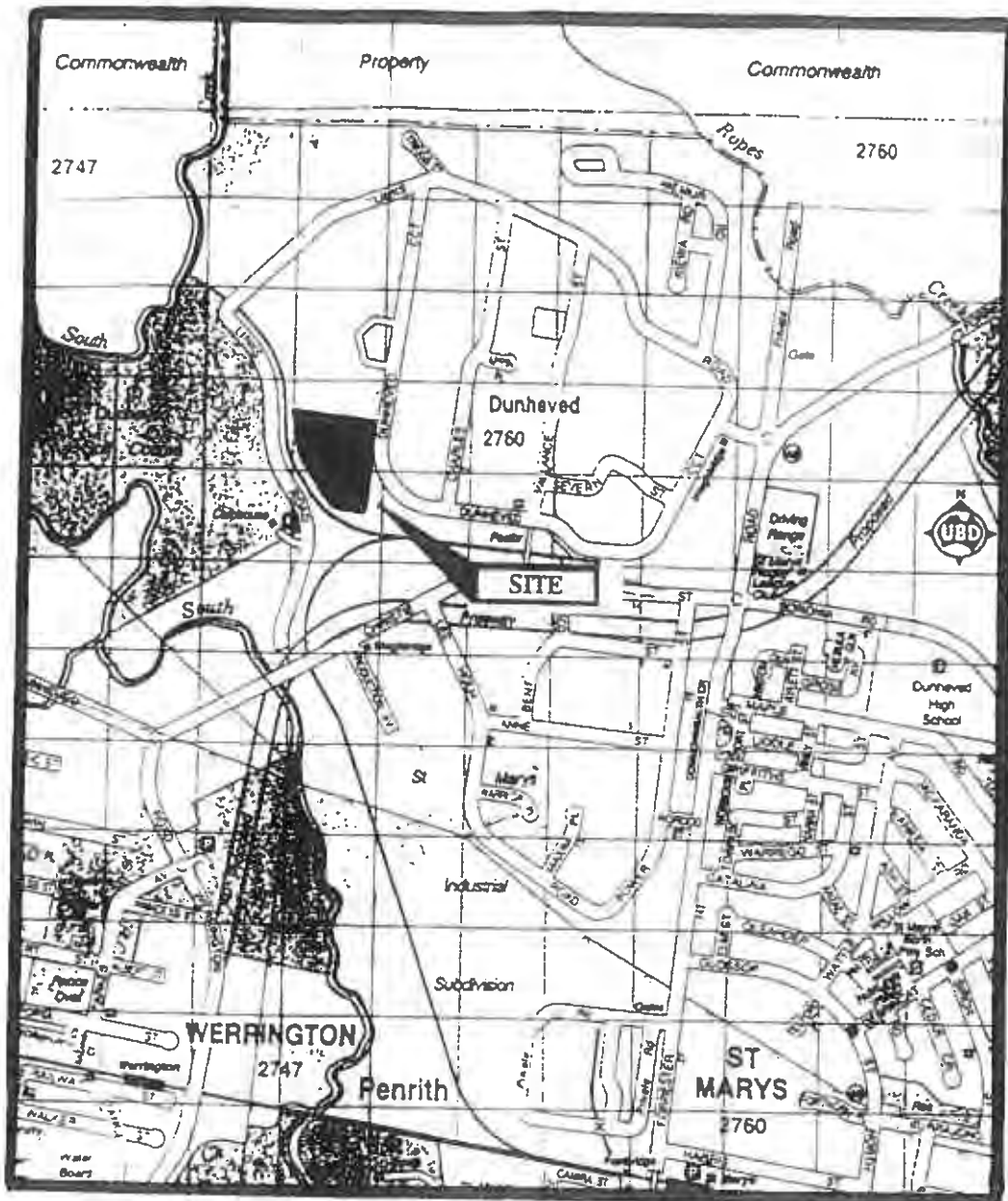
All results are expressed as mg/kg

RPD - Relative Percent Difference



**TABLE 8**  
**Summary of Analytical Results**  
**Quality Control Samples**

Maganic Brothers & Sister Pty Ltd  
Remediation and Validation  
Dunbeved Circuit, St Mary's



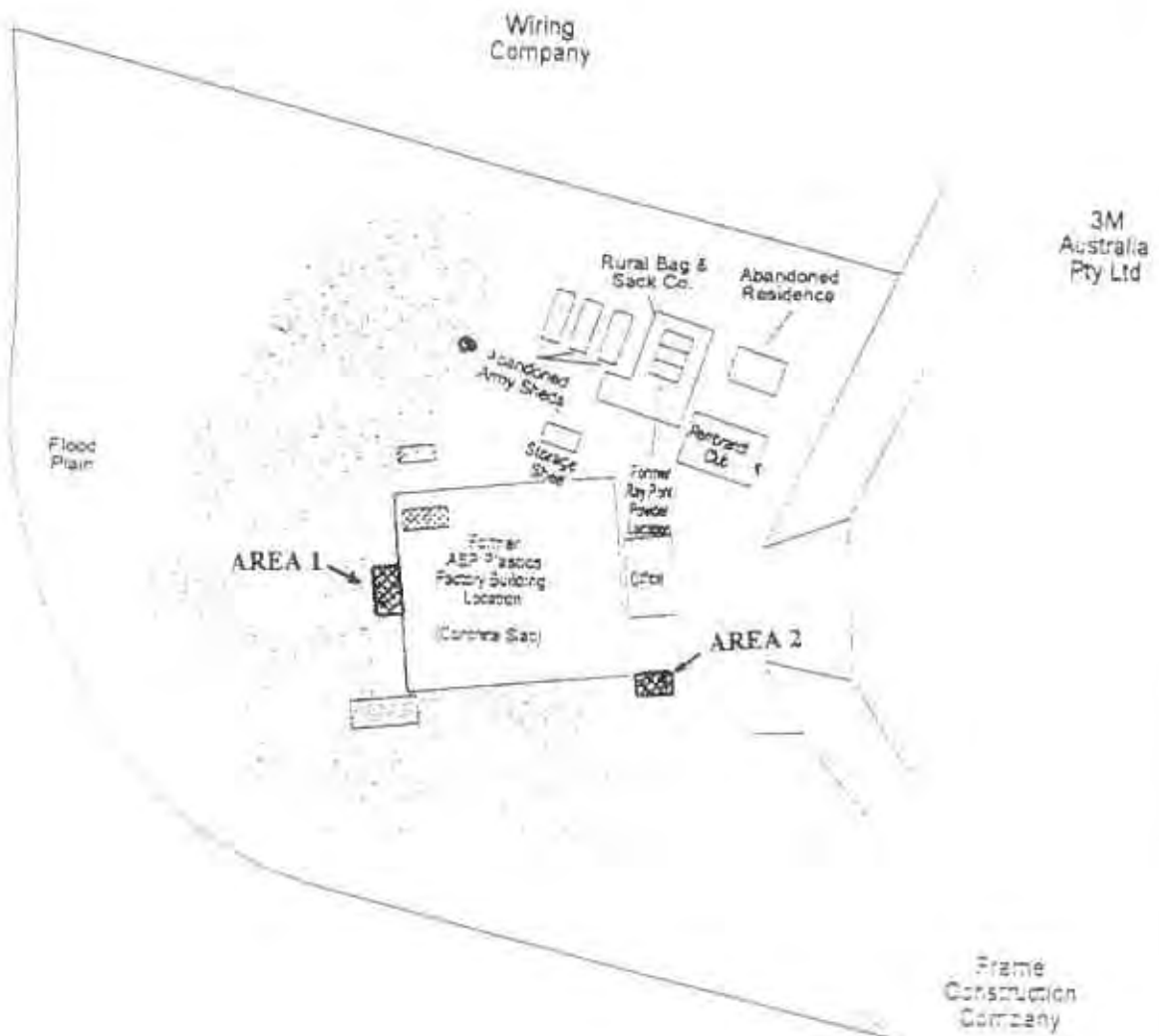
Reproduced with permission of UBD. Universal Press Pty Ltd 1998




Drawn: GF	Date: 28.11.98
Checked By: <i>cm</i>	Date: 24/12
Revision	Date:
Scale 1:20,000	

MAGANIC BROTHERS & SISTER PTY LTD  
 SITE LOCALITY  
 DUNHEVED CIRCUIT, ST MARYS NSW

A4 Project No: 97623169 Drg No: 723169/1



 Denotes remediated areas



Drawn: GF	Date: 28.11.98
Checked By: <i>CMF</i>	Date: <i>24/12</i>
Revision	Date:
Scale: Approx 1:120	

MAGANIC BROTHERS & SISTER PTY LTD

SITE PLAN

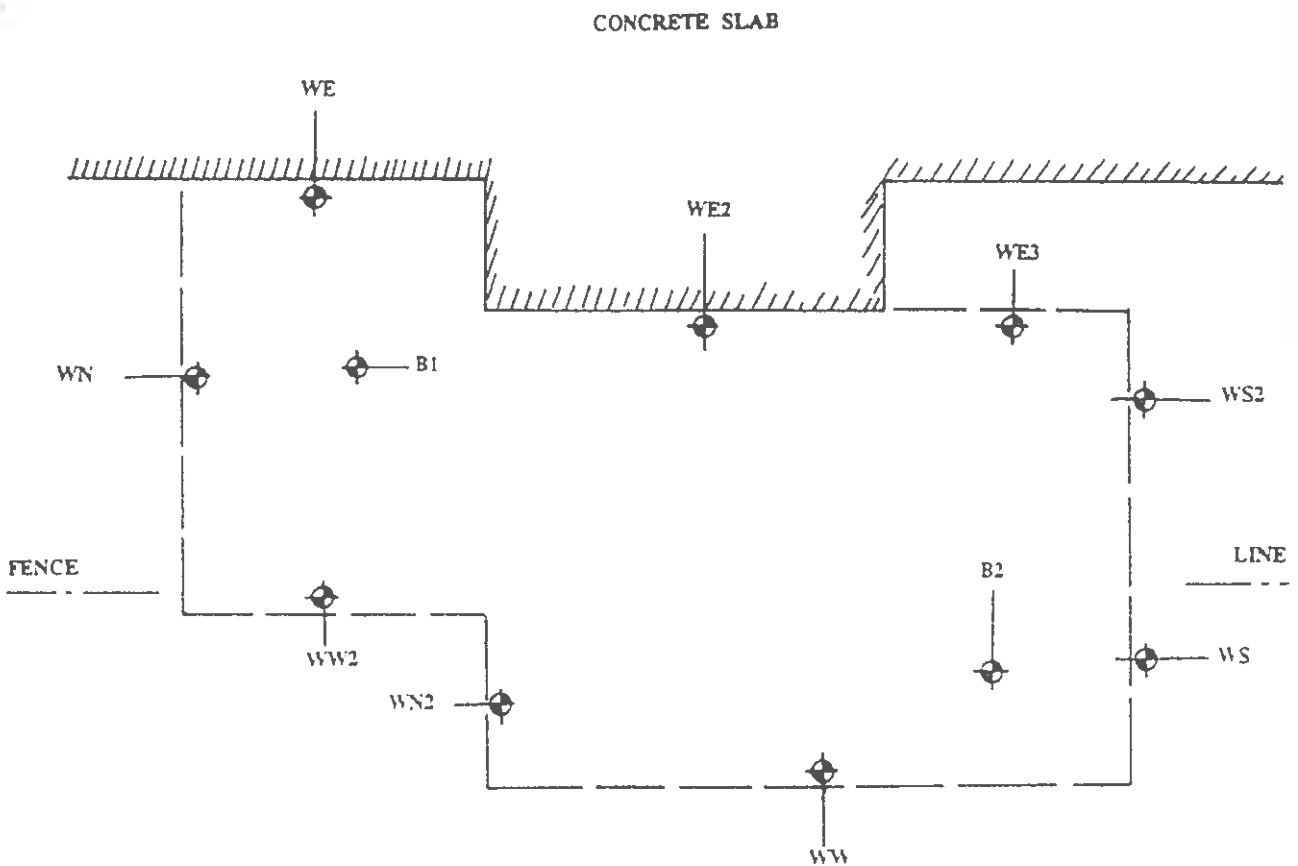
DUNHEVED CIRCUIT, ST MARYS NSW

A4 Project No: 97623169 Drg No: 723169/2

Sample ID	PID (ppm)
WN	12.6*
WN2	10.4
WE	11.6*
WE2	4.3
WE3	5.1
WS	9.4*
WS2	3.6
WW	8.2*
WW2	6.4
B1	11
B2	12.3*

Note

\* Sampled analysed for TPH & Metals



Drawn: GF	Date: 28.11.98
Checked By: <i>emp</i>	Date: 24/12
Revision	Date
Scale: Approx 1:120	

MAGANIC BROTHERS & SISTER PTY LTD  
 SAMPLING LOCATIONS - AREA 1  
 DUNHEVED CIRCUIT, ST MARYS NSW

A4

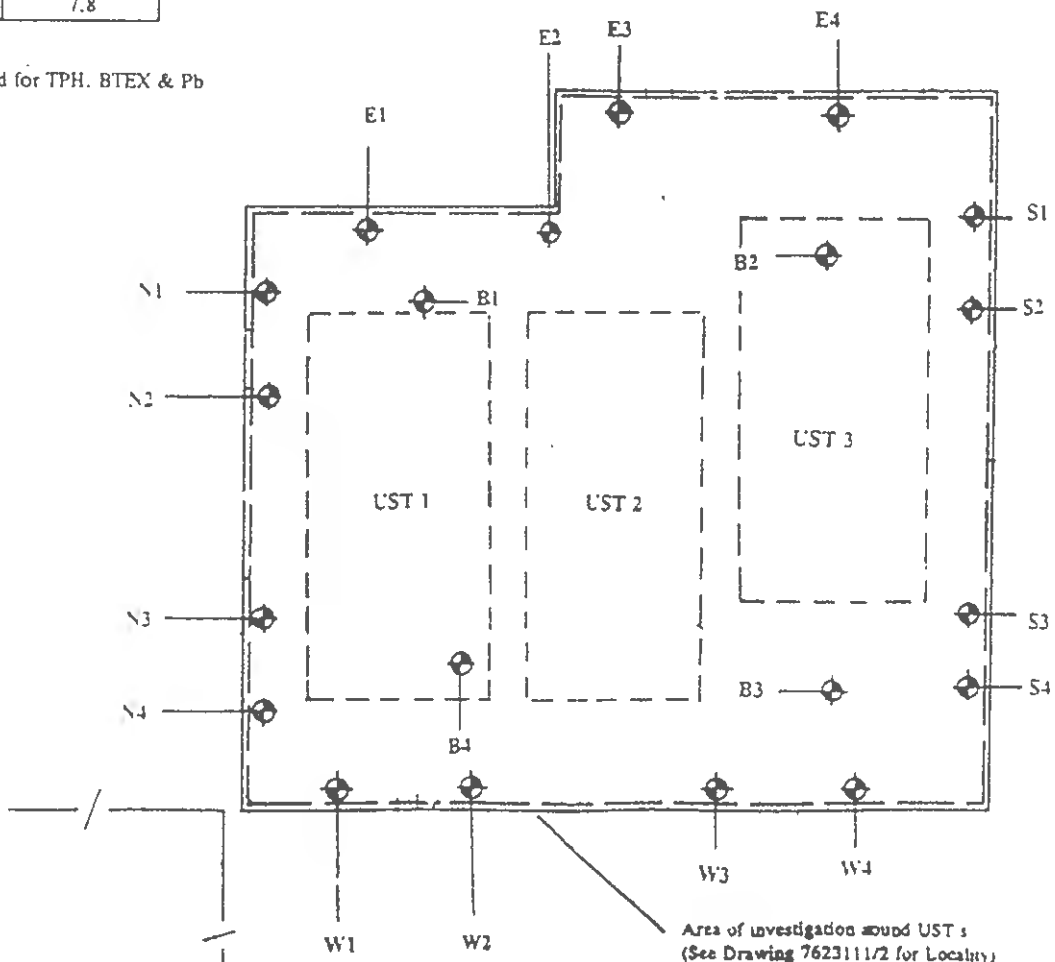
Project No: 97623169

Drg No: 723169/3

Sample ID	PID (ppm)
N1	3.6
N2	5.9*
N3	2.4
N4	2.3
E1	1.6
E2	2.1
E3	4.9*
E4	3.4
S1	3.9
S2	0.5
S3	1.0
S4*	4.6
W1	0.9
W2	2.1
W3*	3.6
W4	2.4
B1	3.1
B2*	6.5
B3	5.3
B4*	7.8

Note;

\* Sample analysed for TPH, BTEX & Pb



Drawn: GF	Date: 28.11.98
Checked By: <i>ant</i>	Date: <i>20/12</i>
Revision	Date:
Scale: Approx 1:60	A4

MEGANIC BROTHERS & SISTER PTY LTD  
 SAMPLING LOCATIONS - AREA 2  
 DUNHEVED CIRCUIT, ST MARYS NSW

Project No: 97623169 Drg No: 723169-4

17 December 1998

97623169/A

## Appendix A

### INFORMATION ON SAMPLING AND PID SCREENING



## SOIL SAMPLING

Soil samples recovered were collected directly from the excavator bucket. Immediately after collection, samples were placed in new jars and stored in cooled conditions while in the field and in transit to the laboratory.

Samples were collected in duplicate at all intervals of depth. The primary sample was retained for selection of samples for laboratory analysis whilst the duplicate samples were used for PID screening for volatile compounds. The instrument used was a Photovac Microtip Model MP-1000 fitted with a 10.6 eV lamp. Prior to use, the instrument was calibrated with isobutylene in nitrogen at a concentration of 92 ppm<sub>v</sub>.

## HEADSPACE SCREENING USING THE PHOTOIONISATION DETECTOR (PID) GENERAL PRINCIPLES

The photoionisation detector (PID) is used to detect the presence of volatile compounds especially hydrocarbons and chlorinated solvents which are commonly encountered as contaminants.

Although the PID is useful in detecting 'hot spots' and provides qualitative information on the potential for contamination with volatile compounds, the technique has the following limitations:

- The PID works on the principle of ionisation of a compound using an ultraviolet lamp. It is important for the lamp to have an energy higher than the ionisation potential of the compound to be detected. The ionisation potential of a compound is the minimum energy that the compound needs to be ionised. Hence if the PID is fitted with a lamp with an energy of 10.6 eV, it will ionise compounds with ionisation potentials less than this value. Therefore it is important to have some prior indication of the contaminants of concern on the site to interpret the PID readings.
- The PID will respond cumulatively to several compounds simultaneously which means that the reading is the additive concentrations of all the compounds present. Hence even if the PID reading is relatively high, the concentrations of the several individual compounds which have contributed to the reading may be relatively low.
- Each compound will have what is termed a 'response factor' which is the response obtained per mole of the compound being detected. Depending upon the degree of ionisation, the number of ions produced and hence the response of the PID will vary for different compounds. The PID used on this site was calibrated with isobutylene at 92 ppm.
- The geology of the soil is an important factor in the process of partitioning the contaminant between the soil matrix and the headspace. For example the concentration of a contaminant in the headspace will be much higher in a sample of contaminated sand from which the contaminant is easily released compared with the concentration of the contaminant in a clay to which the contaminant may be more strongly adsorbed.
- The method of screening varies and there is currently no standard established. The method used for the present assessment is presented below and has been found to provide results that are appropriate for the information required from screening.

## INSTRUMENT AND METHODOLOGY

The PID instrument used was a Photovac Microtip MP100 fitted with a 10.6 eV lamp. Prior to use the instrument was calibrated in accordance with the manufacturers instructions using standard isobutylene gas at a concentration of 92 ppm.

The soil sample was collected in a 250 ml glass jar to half its capacity. The jar was immediately covered with aluminium foil and capped. The jar was then shaken and was allowed to stand for at least 15 minutes. The lid of the jar was unscrewed and the inlet of the PID nose tube introduced through a small hole made in the aluminium foil. The maximum reading on the display was then recorded.

**Appendix B**  
**Laboratory Certificates**

**SYDNEY  
ANALYTICAL  
LABORATORIES**

Page 1 of 6

Office:  
PO BOX 48  
ERMINGTON NSW 2115

Laboratory:  
1/4 ABBOTT ROAD  
SEVEN HILLS NSW 2147  
Telephone: (02) 9838 8903  
Fax: (02) 9838 8919  
A.C.N. 003 614 695  
NATA Reg. 1884

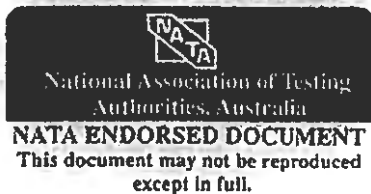
ANALYTICAL REPORT for:

GOLDER ASSOCIATES PTY LTD

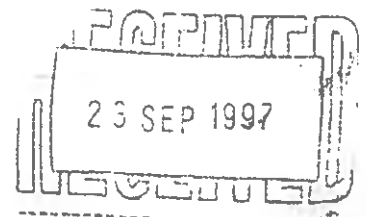
16/11 ROMFORD ROAD  
BLACKTOWN 2148

ATTN: CHRIS FARIAS

JOB NO: SAL5856  
CLIENT ORDER: 97623169  
DATE RECEIVED: 28/08/97  
DATE COMPLETED: 17/09/97  
TYPE OF SAMPLES: SOILS  
NO OF SAMPLES: 20



*Lance Smith*  
.....  
Issued on 20/09/97  
Lance Smith  
(Chief Chemist)



**ANALYTICAL REPORT**

JOB NO: SAL5856  
CLIENT ORDER: 97623169

SAMPLES	Cu mg/kg	Pb mg/kg	Zn mg/kg	Cd mg/kg	Cr mg/kg	As mg/kg
1 SP34(S1)	940	620	850	5.5	12	7.5
2 SP34(S2)	6000	6100	4750	1.5	24	10
3 SPC	400	370	410	2.5	12	5.5
4 SP7(S1)	140	290	260	9.0	14	5.0
5 SP7(S2)	17	17	22	<0.5	10	4.0
6 SP7(S3)	84	90	90	0.5	9.0	5.0
7 SP7(S4)	3950	4300	4400	155	140	9.0
8 WW/0.2	12	16	14	<0.5	8.0	4.5
9 WN/0.1	38	29	51	<0.5	7.5	5.5
10 WE/0.2	22	25	17	<0.5	9.0	5.0
11 WS/0.1	23	44	23	<0.5	9.0	6.0
12 B1/0.3	8.0	18	36	<0.5	11	5.0
13 B2/0.3	45	39	53	<0.5	9.0	5.0
14 WE(D)/0.2	20	29	20	<0.5	8.5	4.5
15 SP7/1	980	1650	1000			
16 SP7/2	570	1090	570			
17 SP7/3	730	550	430			
18 SP7/4	1110	1460	1070			
19 SP7/5	850	870	570			
20 SP7/6	1850	2450	1730			
DUPLICATES:						
15 SP7/1	1000	1680	960			
BCSS-1	18	22	110	<0.5	81	11
MDL	0.5	0.5	0.5	0.5	0.5	0.5
Method Code	M1	M1	M1	M1	M1	M7
Preparation	P3	P3	P3	P3	P3	P3

ANALYTICAL REPORT

JOB NO: SAL5856  
CLIENT ORDER: 97623169

SAMPLES	Hg mg/kg
1 SP34(S1)	0.025
2 SP34(S2)	0.035
3 SPC	0.030
4 SP7(S1)	0.020
5 SP7(S2)	0.025
6 SP7(S3)	0.19
7 SP7(S4)	0.75
8 WW/0.2	0.060
9 WN/0.1	0.11
10 WE/0.2	0.050
11 WS/0.1	0.025
12 B1/0.3	0.015
13 B2/0.3	0.31
14 WE(D)/0.2	0.060
BCSS-1	0.12

MDL 0.005  
Method Code M3  
Preparation P1

RESULTS ON DRY BASIS

LABORATORY DUPLICATE REPORT

JOB NO: SAL5856  
CLIENT ORDER: 97623169

Sample Number	Analyte	Units	MDL	Sample Result	Duplicate Result	%RPD
SP7/1	Copper	mg/kg	0.5	980	1000	2
SP7/1	Lead	mg/kg	0.5	1650	1680	2
SP7/1	Zinc	mg/kg	0.5	1000	960	4

Acceptance criteria:

RPD <50% for low level (<20xMDL)  
RPD <30% for medium level (20-100xMDL)  
RPD <15% for high level (>100xMDL)  
No limit applies at <2xMDL

MDL = Method Detection Limit

All results are within the acceptance criteria

**CERTIFIED REFERENCE MATERIAL**

JOB NO: SAL5856  
CLIENT ORDER: 97623169

CRM Number	Analyte	Units	CRM Result	Certified Value	%Recovery	Acceptance Criteria %
BCSS-1	Copper	mg/kg	18	18.5	97	90-115
BCSS-1	Lead	mg/kg	22	22.7	97	90-110
BCSS-1	Zinc	mg/kg	110	119	92	90-110
BCSS-1	Cadmium	mg/kg	<0.5	0.25	-	-
BCSS-1	Chromium	mg/kg	81	123	66	60-80
BCSS-1	Arsenic	mg/kg	11	11.1	99	90-120
BCSS-1	Mercury	mg/kg	0.12	0.129	93	85-110

All results are within the acceptance criteria

Note: The hot acid digest does not always determine 'total' metals. Refractory elements such as Iron and Aluminium and some base metals (particularly Chromium) show lower recoveries depending on their form within the sample matrix. Silicates and oxides are normally less soluble than elements in metallic or salt forms. The acceptance criteria for this reference material is based on histories of analyte recoveries using the nitric acid based digestion procedures.

ANALYTICAL REPORT

JOB NO: SAL5856

CLIENT ORDER: 97623169

METHODS OF PREPARATION AND ANALYSIS

The tests contained in this report have been carried out on the samples as received by the laboratory.

- P3 Sample dried, jaw crushed and sieved at 2mm
- P1 Analysis performed on sample as received
- M1 Base Metal - Digestion Method 3050 (HNO<sub>3</sub>/H<sub>2</sub>O<sub>2</sub>)  
Element determined by APHA 3111B (Flame AAS)
- M7 Hydride Element - Digestion Method 7061 (HNO<sub>3</sub>/H<sub>2</sub>SO<sub>4</sub>)  
Element determined by APHA 3114B (Hydride Generation AAS)
- M3 Mercury - Digestion Method 7471 (HNO<sub>3</sub>/HCl)  
Determined by APHA 3112B (Cold Vapour AAS)

A preliminary report was faxed on 17/09/97

Requested by: C. Farnham Date: 28-8-97  
 Organization: Coleman Brown Date: 17.12.96  
 Received by: Hydrophobic Date: 28-8-97  
 Date: \_\_\_\_\_  
 Organization: \_\_\_\_\_  
 Date: \_\_\_\_\_

Sample No.	ANALYSIS	DATE	RESULTS	NO. OF	ANALYST
SP24 (SI)		27/6/97	502	1	
SP24 (S2)				1	
SP C				1	
SP3 (SI)				1	
SP3 (S2)				1	
SP3 (S3)				1	
SP3 (S4)				1	
MS1				1	
HM				1	
MC				1	
MS				1	
B1				1	
G2				1	
MC (S1)				1	

Job Number:	97628169
Location:	St. Mary's
Order No.:	
Sampled by:	GT
Lab Contact:	CHRIS FARNHAM
GC/MS Scan (TYPED IDENTIFICATION)	
Sample ID:	
Ref. to file:	MS 17250
pH	
Total Petroleum Hydrocarbons (TPH)	
BTEX	
Petroleum Aromatic Hydrocarbons (PAH)	
Phenols	
Organochlorine Pesticides (OCP)	
Polychlorinated Biphenyls (PCB)	
Inorganic Anions Organic	
Chloride	



Golder Associates

DATE: 5.9.97

CHAIN OF CUSTODY

Golder Associates Pty Ltd  
 35 Hunter Street  
 FRODOB, WEST, NSW 2109

Phone: (02) 439 36  
 Fax: 436 0603

Job Number:	9762209	GC/MS Scan (TPH, PAH, Phenolics)	
Location/Job:	ST MARINS	Metals I (As Cd Cr Cu Hg Pb Zn)	
Order No.:	9762209	Metals II (Be Co Mn Ni Sb Se Sn)	(Lead Pb)
Sampled by:	CM	pH	
Job Contact:	CHAS MARINS	Total Petroleum Hydrocarbons (TPH)	
		BTX	
		Polycyclic Aromatic Hydrocarbons (PAH)	
		Phenolics	
		Organochlorine Pesticides (OCP)	
		Polychlorinated Biphenyls (PCB)	
		Halogenated Volatile Organics	
		Cyanide	
		Copper (Cu)	X
		Zinc (Zn)	X

SAMPLE No.	SAMPLE DEPTH (m)	MEDIA	No. of Vessels	SAMPLE DATE																	
SR7/1	2/10	Soil	1	11/9/97																	
SR7/2	"	"	1	"																	
SR7/3	"	"	1	"																	
SR7/4	"	"	1	"																	
SR7/5	"	"	1	"																	
SR7/6	"	"	1	"																	

Special Instructions:

Relinquished by: Glen Fuller Date: 2/9/97

Relinquished by: Date:

Organization: Coldex Associates Time: 9.30

Organization: Time:

Received by: AB Murphy Date: 12.9.97

Received by: Date:

Organization: Time: 9.30

Organization: Time:

Organization: Time:

**SYLVEY  
ANALYTICAL  
LABORATORIES**

Page 1 of 3

Office:  
PO BOX 48  
ERMINGTON NSW 2115

Laboratory:  
1/4 ABBOTT ROAD  
SEVEN HILLS NSW 2147  
Telephone: (02) 9838 8903  
Fax: (02) 9838 8919  
A.C.N. 003 614 695  
NATA Reg. 1884

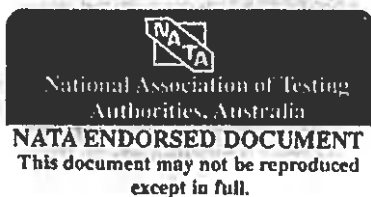
ANALYTICAL REPORT for:

GOLDER ASSOCIATES PTY LTD

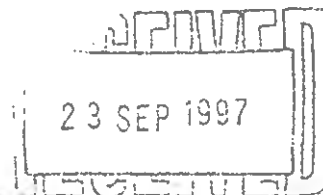
16/11 ROMFORD ROAD  
BLACKTOWN 2148

ATTN: CHRIS FARIAS

JOB NO: SA5856B  
CLIENT ORDER: 97623169  
DATE RECEIVED: 28/08/97  
DATE COMPLETED: 17/09/97  
TYPE OF SAMPLES: SOILS  
NO OF SAMPLES: 4



*Lance Smith*  
.....  
Issued on 20/09/97  
Lance Smith  
(Chief Chemist)



**ANALYTICAL REPORT**

JOB NO: SA5856B  
CLIENT ORDER: 97623169

SAMPLES	pH Initial	Cu mg/L	Pb mg/L	Zn mg/L	Cd mg/L	Cr mg/L
1 SP34(S2)	7.1	15.2	17.9	60.8	<0.01	<0.01
2 SP7(S4)	7.4	8.5	12.5	56.5	1.2	0.02
3 TP7/0.2	7.8	21.5	23.8	75.9	1.0	
4 TP34/0.2	6.5	175	220	840		
MDL	0.1	0.01	0.01	0.01	0.01	0.01
Method Code	METER	LT1	LT1	LT1	LT1	LT1
Preparation	P1	P1	P1	P1	P1	P1

ANALYSES ON LEACHATE  
LEACHATE MEDIUM = 1

ANALYTICAL REPORT

JOB NO: SA5856B

CLIENT ORDER: 97623169

METHODS OF PREPARATION AND ANALYSIS

The tests contained in this report have been carried out on the samples as received by the laboratory.

P1 Analysis performed on sample as received

METER Initial pH - 1:20 water extract

LT1 Metal - Leaching WD3  
Determined by APHA 3111B/D (Flame AAS)

A preliminary report was faxed on 17/09/97



# CHAIN OF CUSTODY

LAB: SAL

Golder Associates Pty Ltd  
35 Hume Street  
CARRYS BERTH NSW 1045

Phone: (02) 437 36  
Fax: (36 0493)

Page: \_\_\_\_\_  
of: \_\_\_\_\_  
Date: \_\_\_\_\_

Job Number: <u>97623169</u>					CCMS Scan (TPH, PAH, Phthalates)	Metals I (As, Cd, Cr, Cu, Hg, Pb, Zn)	Metals II (Br, Co, Ni, N, Sb, Se, Sp)	pH	Total Petroleum Hydrocarbons (TPH)	BTEX	Polycyclic Aromatic Hydrocarbons (PAH)	Pesticides	Organochlorine Pesticides (OCP)	Polychlorinated Biphenyls (PCB)	Halogenated Volatile Organics	Cyanide	Cu Pb Zn	Cd	Cr
Location/Job: <u>St Mary's</u>																			
Order No.: _____																			
Sampled By: <u>GF</u>																			
Job Contact: <u>CHRIS PARIAS</u>																			
SAMPLE No.	SAMPLE DEPTH (m)	MEDIA	No. of Vessels	SAMPLE DATE															
<u>SP34(SL)</u>	<u>SP</u>	<u>SOIL</u>	<u>1</u>	<u>*</u>															
<u>SP7(SL)</u>	<u>SP</u>	<u>"</u>	<u>1</u>	<u>*</u>															
<u>SP7(OL)</u>	<u>0.1</u>	<u>"</u>	<u>1</u>	<u>*</u>															
<u>TP34(OL)</u>	<u>0.2</u>	<u>"</u>	<u>1</u>	<u>*</u>															
* Sample sent earlier refer previous CAC																			
Special Instructions: <u>Only TCLP Tests</u>																			
Requested by: <u>Chris Parias</u>					Date: <u>4/9/97</u>					Requested by:					Date:				
Organisation: <u>Golder Associates</u>					Time:					Organisation:					Time:				
Received by: <u>[Signature]</u>					Date: <u>4/9/97</u>					Received by:					Date:				
Organisation:					Time:					Organisation:					Time:				



4 September 1997

**GOLDER ASSOCIATES**  
UNIT 16, 11 ROMFORD ROAD  
BLACKTOWN NSW 2148

Your Reference: St Mary's 97623169  
Australian Environmental Laboratories Report No.

6788

Attention: CHRIS FARIAS

Dear Sir

We received 14 soil samples on the 28th of August 1997. The samples were analysed in accordance with your instructions and the results are contained in this report.

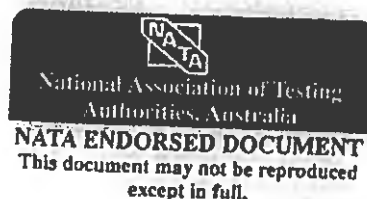
A preliminary report was faxed to you on the 3rd of September 1997

Results are reported on a dry weight basis for soils

Yours faithfully  
AUSTRALIAN ENVIRONMENTAL LABORATORIES

Tania Notaras  
Laboratory Manager

Melanie Murray  
Senior Organic Chemist



GOLDER ASSOCIATES  
Project: St Mary's (97623169)

OUR REFERENCE	6788-1	6788-1.rpt	6788-2	6788-3	6788-4	6788-5	6788-6	6788-7	6788-8	6788-9	6788-10
YOUR REFERENCE	SP34(S1)	SP34(S1)	SP34(S2)	SPC	SP7(S1)	SP7(S2)	SP7(S3)	SP7(S4)	WW	WN	WE
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Hydrocarbons C6-C9	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Hydrocarbons C10-C14	590	830	<20	57	840	890	<20	24	<20	<20	<20
Hydrocarbons C15-C28	950	1100	<50	240	1900	1100	<50	1300	<50	<50	<50
Hydrocarbons C29-C40	680	920	<50	140	<50	<50	<50	900	<50	<50	<50

Method Codes : TPH (SEO-020)



Analabs REPORT NO.:6788

GOLDER ASSOCIATES  
Project: St Mary's (97623169)

OUR REFERENCE	6788-11	6788-12	6788-13	6788-14	.BLANK	.SPK (6788/4)
YOUR REFERENCE	WS	B1	B2	VW (D)		
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%Recovery
Hydrocarbons C6-C9	<20	<20	<20	<20	<20	108
Hydrocarbons C10-C14	<20	<20	<20	<20	<20	114
Hydrocarbons C15-C28	<50	<50	<50	<50	<50	101
Hydrocarbons C29-C40	<50	<50	<50	<50	<50	115

Method Codes : TPH (SEO-020)





# CHAIN OF CUSTODY

0 SEP 1997

Golder Associates Pty Ltd  
 25 Hunter Street  
 CHOWS NEST NSW 1065

Phone: (02) 439 36  
 Fax: 436 0693

LAB: AEL

Job Number: 97623169  
 Location/Job: St Mary's  
 Order No.: \_\_\_\_\_  
 Sampled By: GF  
 Job Contact: CHRIS FARIAS

SAMPLE No.	SAMPLE DEPTH (m)	MEDIA	No. of Vessels	SAMPLE DATE	GC/MS Scan (TPH, PAH, Pyrolysis)	Metals I (As Cd Cr Cu Hg Pb Zn)	Metals II (Ba Co Mn Ni Pb Sr Sn)	pH	Total Petroleum Hydrocarbons (TPH)	BTEX	Polycyclic Aromatic Hydrocarbons (PAH)	Pesticides	Organohalogen Pesticides (OCP)	Polychlorinated Biphenyls (PCB)	Halogenated Volatile Organics	Cyanide
-1	SP34 (S1)	Soil	1	27/8/97					✓							
-2	SP34 (S2)	"	1	27/8/97					✓							
-3	SP C	"	1	"					✓							
-4	SP7 (S1)	"	1	"					✓							
-5	SP7 (S2)	"	1	"					✓							
-6	SP7 (S3)	"	1	"					✓							
-7	SP7 (S4)	"	1	"					✓							
-8	WH1	0.2	1	"					✓							
-9	WH	0.1	1	"					✓							
-10	WC	0.2	1	"					✓							
-11	WS	0.1	1	"					✓							
-12	B1	0.3	1	"					✓							
-13	B2	0.3	1	"					✓							
-14	<del>WH</del>															
-15	WH(D)	0.2	1	"					✓							

**Australian Environmental Laboratories**  
 Received: 28/8/97  
 Time: 3:30 am  
 By: SCN  
 Laboratory pack:  Yes  
 Samples intact:  Yes  
 Results expected by: 2/9/97  
 Contact Name: DAVID  
 Comments:  
6788

Special Instructions:

Relinquished by: <u>C. Fari</u>	Date: <u>28-8-97</u>	Relinquished by:	Date:
Organisation: <u>Golder Associates</u>	Time:	Organisation:	Time:
Received by: <u>David Sp...</u>	Date: <u>28/8/97</u>	Received by:	Date:
Organisation: <u>AEL</u>	Time: <u>6:30pm</u>	Organisation:	Time:



**Australian  
Environmental  
Laboratories**



Quality  
Endorsed  
Company  
08 8882 12 788  
Sydney Australia

3 July 1997

GOLDER ASSOCIATES  
16/11 ROMFORD RD  
BLACKTOWN NSW 2148

RECEIVED  
7 JUL 1997

Your Reference: ST MARYS 97623137  
Australian Environmental Laboratories Report No 6319

Attention: CHRIS FARIAS

Dear Sir

We received 8 soil samples on the 30th of June 1997. The samples were analysed in accordance with your instructions and the results are contained in this report.

Results are reported on a dry weight basis for soils

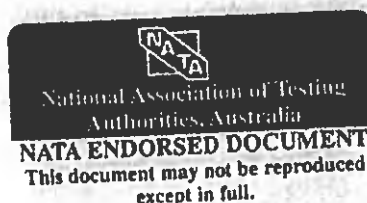
Yours faithfully  
AUSTRALIAN ENVIRONMENTAL LABORATORIES

*Tania Notaras*

Tania Notaras  
Laboratory Manager

*Melanie Murray*

Melanie Murray  
Senior Organic Chemist



(Analabs Pty. Ltd.) ACN 004 591 664  
12 Exell Street, Banksmeadow, New South Wales 2019 Australia  
Telephone: (61 2) 9316 4255 Facsimile: (61 2) 9316 5511

7 JUL 1997

Analabs REPORT NO.:6319

GOLDER ASSOCIATES  
Project: ST MARYS (97623137)

OUR REFERENCE	6319-1	6319-1.rpt	6319-2	6319-3	6319-3 rpt	6319-4	6319-5	6319-6	6319-7	6319-8	BLANK
YOUR REFERENCE	N2	N2	W3	E3	E3	S4	B2	B4	B4 D	STOCKPILE	
DEPTH	2.0	2.0	2.5	2.5	2.5	2.5	3.0	3.0	3.0		
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
Lead, Pb	<5	<5	<5	5.4		<5	<5	<5	<5	<5	<5
Hydrocarbons C6-C9	<20	-	<20	<20	<20	<20	<20	<20	<20	<20	<20
Hydrocarbons C10-C14	<20		<20	<20	<20	<20	<20	<20	<20	<20	<20
Hydrocarbons C15-C28	<50	-	<50	<50	<50	<50	<50	<50	<50	<50	<50
Hydrocarbons C29-C40	<50	-	<50	<50	<50	<50	<50	<50	<50	<50	<50
Benzene	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethyl Benzene	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylenes	<1.5	<1.5	<1.5	<1.5	-	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
BTEX Surrogate Spike (%)	111	115	115	112	-	113	115	107	106	113	-

Method Codes : TPH (SEO-020) / BTEX (SEO-017), \* OUTSIDE ACCEPTED CRITERIA, ALL OTHER SPIKES IN BATCH / RUN OK.

3/2  
3/2  
PAGE 2 OF 3

JUL 1997  
 7 JUL 1997  
 ANALABS

Analabs REPORT NO.:6319

GOLDER ASSOCIATES  
 Project: ST MARYS (97623137)

OUR REFERENCE	SPK (6319/2)	SPK (6319/2) rpt	SPK (6319/8)	SPK (6319/8) rpt
YOUR REFERENCE				
DEPTH				
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL
UNITS	%Recovery	%Recovery	%Recovery	%Recovery
Lead, Pb	102	101	-	-
Hydrocarbons C6 C9	-	-	79	83
Hydrocarbons C10-C14	-	-	70	65 *
Hydrocarbons C15-C28	-	-	84	83
Hydrocarbons C29-C40	-	-	89	87
Benzene	84	85	-	-
Toluene	106	108	-	-
Ethyl Benzene	115	116	-	-
Xylenes	116	118	-	-
BTEX 'Surrogate Spike (%)	113	112	-	-

Method Codes : TPH (SEO-020) / BTEX (SEO-017). \* OUTSIDE ACCEPTED CRITERIA, ALL OTHER SPIKES IN BATCH / RUN OK.

157/2  
 PAGE 3 OF 3



# CHAIN OF CUSTODY

*Handwritten notes:*  
 JUN 1997  
 [Signature]

LAB: ACL

Golder Associates Pty Ltd  
 35 Hunt Street  
 CROWS NEST NSW 2065

Phone: (02) 439 36  
 Fax: 436 0693

Page 1  
 of 1

Job Number: 97623137  
 Location/Job: ST MARYS  
 Order No.: 97623  
 Sampled By: GP  
 Job Contact: CHRIS TARRANTS

GC/MS Scan (TPH, PAH, Phenolics)	Metals I (As Cd Cr Cu Hg Pb Zn)	Metals II (Be Co Mn Ni Sb Sr Sn)	pH	Total Petroleum Hydrocarbons (TPH)	BTEX	Polycyclic Aromatic Hydrocarbons (PAH)	Phenolics	Organochlorine Pesticides (OCP)	Polychlorinated Biphenyls (PCB)	Halogenated Volatile Organics
				X	X					
				X	X					
				X	X					
				X	X					
				X	X					
				X	X					
				X	X					
				X	X					
				X	X					
				X	X					

SAMPLE No.	SAMPLE DEPTH (m)	MEDIA	No. of Vessels	SAMPLE DATE
1 N2	2.0m	SOIL	1	24.6.97
2 W3	2.5m	SOIL	1	"
3 E3	2.5m	SOIL	1	"
4 S4	2.5m	SOIL	1	"
5 B2	3.0m	SOIL	1	"
6 B4	3.0m	SOIL	1	"
7 B4 (0)	3.0m	SOIL	1	"
8 STOCKPILE	—	SOIL	1	"

**Australian Environmental Laboratories**  
 Received: 30.6.97  
 Time: 3:20 pm  
 By: Vona  
 Ice/cooler pack:   
 Samples intact:   
 Results Expected by: 7/7/97  
 Contact Name: [Signature]  
 Comments: 6319

**Special Instructions:**

Relinquished by: <u>Glen Fisher</u> Date: <u>30.6.97</u>	Relinquished by: _____ Date: _____
Organisation: <u>Golder Assoc. of</u> Time: <u>11:00 am</u>	Organisation: _____ Time: _____
Received by: <u>Vona</u> Date: <u>30/6/97</u>	Received by: _____ Date: _____
Organisation: <u>ACL</u> Time: <u>3:20 pm</u>	Organisation: _____ Time: _____

**SYDNEY  
ANALYTICAL  
LABORATORIES**

Page 1 of 3

Office:  
PO BOX 48  
ERMINGTON NSW 2115

Laboratory:  
1/4 ABBOTT ROAD  
SEVEN HILLS NSW 2147  
Telephone: (02) 9838 8903  
Fax: (02) 9838 8919  
A.C.N. 003 614 695  
NATA Reg. 1884

*Conf. Conf.*

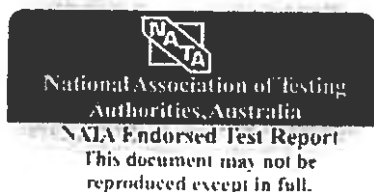
ANALYTICAL REPORT for:

GOLDER ASSOCIATES PTY LTD

PO BOX 6027  
BLACKTOWN 2148

ATTN: CHRIS FARIAS

JOB NO: SA7294D  
CLIENT ORDER: 97623169  
DATE RECEIVED: 22/04/98  
DATE COMPLETED: 23/04/98  
TYPE OF SAMPLES: SOIL  
NO OF SAMPLES: 1



*CS*  
.....  
Issued on 24/04/98  
Lance Smith  
(Chief Chemist)

**SYDNEY  
ANALYTICAL  
LABORATORIES**

**ANALYTICAL REPORT**

JOB NO: SA7294D  
CLIENT ORDER: 97623169

SAMPLES	pH Initial	Pb mg/L	Cd mg/L	Ni mg/L
1 MIX/E	12.0	4.1	<0.01	<0.01
MDL	0.1	0.01	0.01	0.01
Method Code	METER	LT1	LT1	LT1
Preparation	P1	P1	P1	P1

ANALYSES ON LEACHATE  
LEACHATE MEDIUM = 2

ANALYTICAL REPORT

JOB NO: SA7294D

CLIENT ORDER: 97623169

METHODS OF PREPARATION AND ANALYSIS

The tests contained in this report have been carried out on the samples as received by the laboratory.

P1 Analysis performed on sample as received

METER Initial pH - 1:20 water extract

LT1 Metal - Leaching WD3  
Determined by APHA 3111B/D (Flame AAS)

A preliminary report was faxed on 23/04/98

**SYDNEY  
ANALYTICAL  
LABORATORIES**

Office:  
PO BOX 48  
ERMINGTON NSW 2115

Laboratory:  
1/4 ABBOTT ROAD  
SEVEN HILLS NSW 2147  
Telephone: (02) 9838 8903  
Fax: (02) 9838 8919  
A.C.N. 003 614 695  
NATA Reg. 1884

*C.M.*      *C.M.S.*

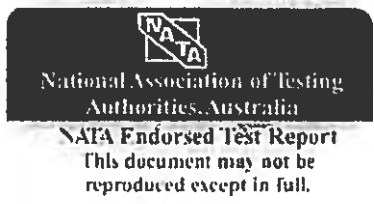
ANALYTICAL REPORT for:

GOLDER ASSOCIATES PTY LTD

PO BOX 6027  
BLACKTOWN 2148

ATTN: CHRIS FARIAS

JOB NO: SA7294C  
CLIENT ORDER: 97623169  
DATE RECEIVED: 12/06/98  
DATE COMPLETED: 19/06/98  
TYPE OF SAMPLES: SOILS  
NO OF SAMPLES: 2



*(Signature)*  
.....  
Issued on 22/06/98  
Lance Smith  
(Chief Chemist)

SYNEY  
ANALYTICAL  
LABORATORIES

ANALYTICAL REPORT

JOB NO: SA7294C  
CLIENT ORDER: 97623169

SAMPLES	pH Initial	Pb mg/L	Cd mg/L	Ni mg/L
1 AT/1	12.5	1.3	<0.01	<0.01
2 AT/2	12.4	1.4	<0.01	<0.01
MDL	0.1	0.01	0.01	0.01
Method Code	METER	LT1	LT1	LT1
Preparation	P1	P1	P1	P1

ANALYSES ON LEACHATE  
LEACHATE MEDIUM = 2

ANALYTICAL REPORT

JOB NO: SA7294C

CLIENT ORDER: 97623169

METHODS OF PREPARATION AND ANALYSIS

The tests contained in this report have been carried out on the samples as received by the laboratory.

P1 Analysis performed on sample as received

METER Initial pH - 1:20 water extract

LT1 Metal - Leaching WD3  
Determined by APHA 3111B/D (Flame AAS)

A preliminary report was faxed on 19/06/98



# CHAIN OF CUSTODY

LAB: S.A.L.

Golder Associates Pty Ltd  
 Unit 170 Goring Hill  
 Kings Park NSW 2148

Phone: (02) 9831 7194  
 Fax: (02) 9831 7224

Page 1  
 of 1  
 information

Job Number: <u>97623169</u> Location/Job: <u>ST MARKS</u> Order No.: <u>97623169</u> Sampled By: <u>CF</u> Job Contact: <u>Glen Fuller</u>					GCMS SCAN (TPH, PAH, Phenolics)	Metals I (As, Cd, Cr, Cu, Pb, Fe, Zn, Ni)	Metals II (Ba, Co, Mn, Ni, Sb, Se, Si)	pH	Total Petroleum Hydrocarbons (TPH)	BTX	Polycyclic Aromatic Hydrocarbons (PAHs)	Phenolics	Organochlorine Pesticides (OCP)	Polychlorinated Biphenyls (PCB)	Halogenated Volatile Organics	Cyanide	XX Pb / TCDF
SAMPLE No:	SAMPLE DEPTH(m)	MEDIA	No of Vessels	SAMPLE DATE													
A71	—	Fine	1	29/5/98													
A72	—	Fine	1	"													
Special Instructions: <u>Please Advise on Result of Pb Before Proceeding with TCDF</u>																	
Relinquished by: <u>Glen Fuller</u> Organisation: <u>Golder Associate</u> Received by: <u>Michael</u> Organisation: <u>SAL Michael</u>					Date: <u>12/6/98</u> Time: <u>1:00pm</u> Date: <u>12-6-98</u> Time: <u>4:00</u>					Relinquished by: _____ Date: _____ Organisation: _____ Time: _____ Received by: _____ Date: _____ Organisation: _____ Time: _____							

**Appendix C**  
**Weighbridge Dockets**

**WEIGHBRIDGE DOCKET No. A0023985**

15:22  
 02/10/98

Time out  
 Gate out

Docket no

**ORN322**

C  
 H 093516

ACCOUNT No. = **209999**  
 C. = **COMMERCIAL CASH SALES**  
 A. = **ERSKINE PARK**  
 EPA Consent = 25272/76/05  
 F. = **LL CONTAMINATED SOIL**  
 Price Per = \$45.00/tonne

CNT8

**GROSS 16.08**  
**TARE 9.66**  
**NET 6.42**

**AMOUNT OWING → \$288.90 PAID**  
**COMMUNITY WASTE MANAGEMENT 353100**



**Acc No. A0023945**

14:19  
 02/10/98

**ORN322**

C  
 H 093515

ACCOUNT No. = **209999**  
 C. = **COMMERCIAL CASH SALES**  
 A. = **ERSKINE PARK**  
 EPA Consent = 25272/76/05  
 F. = **LL CONTAMINATED SOIL**  
 Price Per = \$45.00/tonne

CNT8

**GROSS 18.98**  
**TARE 9.66**  
**NET 9.32**

**AMOUNT OWING → \$419.40 PAID**  
**COMMUNITY WASTE MANAGEMENT 353062**

17 December 1998

97623169/A

**Appendix D**  
**"Important Information About Your Environmental Site Assessment"**

## Important Information About Your

# Environmental Site Assessment

*These notes have been prepared by Golder Associates Pty Ltd using guidelines prepared by ASFE, The Association of Engineering Firms Practising in the Geosciences, of which Golder Associates Pty Ltd is a member. They are offered to help you in the interpretation of your Environmental Site Assessment (ESA) report.*

### Reasons For Conducting An ESA

ESA's are typically, though not exclusively carried out in the following circumstances:

- as pre-acquisition assessments, on behalf of either purchaser or vendor, when a property is to be sold;
- as pre-development assessments, when a property or area of land is to be redeveloped or have its use changed, for example, from a factory to a residential subdivision;
- as pre-development assessments of greenfield sites, to establish "baseline" conditions and assess environmental, geological and hydrogeological constraints to the development of, for example, a landfill; and
- as audits of the environmental effects of an ongoing operation.

Each of these circumstances requires a specific approach to the assessment of soil and groundwater contamination. In all cases, however, the objective is to identify and if possible quantify the risks which unrecognised contamination poses to the proposed activity. Such risks may be both financial, for example, clean-up costs or limitations on site use, and physical, for example, health risks to site users or the public.

### The Limitations of An ESA

Although the information provided by an ESA can reduce exposure to such risks, no ESA, however diligently carried out, can eliminate them. Even a rigorous professional assessment may fail to detect all contamination on a site. Contaminants may be present in areas that were not surveyed or sampled, or may migrate to areas which showed no signs of contamination when sampled.

### An ESA Report Is Based On A Unique Set of Project Specific Factors

Your environmental report should not be used:

- When the nature of the proposed development is changed, for example, if a residential development is proposed instead of a commercial one;

- When the size or configuration of the proposed development is altered;
- when the location or orientation of the proposed structure is modified;
- When there is a change of ownership; or
- For the application to an adjacent site.

To help avoid costly problems, refer to your consultant to determine how any factors which have changed subsequent to the date of the report may affect its recommendations.

### ESA "Findings" Are Professional Estimates

Site assessment identifies actual subsurface conditions only at those points where samples are taken, when they are taken. Data derived through sampling and subsequent laboratory testing are interpreted by geologists, engineers or scientists who then render an opinion about overall subsurface conditions, the nature and extent of contamination, its likely impact on the proposed development and appropriate remediation measures. Actual conditions may differ from those inferred to exist, because no professional, no matter how qualified, and no subsurface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than a report indicates. Actual conditions in areas not sampled may differ from predictions. Nothing can be done to prevent the unanticipated, but steps can be taken to help minimise its impact. For this reason, owners should retain the services of their consultants through the development stage, to identify variations, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site.

### Subsurface Conditions Can Change

Subsurface conditions are changed by natural processes and the activity of man. Because an ESA report is based on conditions which existed at the time of subsurface exploration, decisions should not be based on an ESA report whose adequacy may have been affected by time. Speak with the consultant to learn if additional tests are advisable.

### **ESA Services Are Performed For Specific Purposes And Persons**

Every study and ESA report is prepared in response to a specific Brief to meet the specific needs of specific individuals. A report prepared for a consulting civil engineer may not be adequate for a construction contractor, or even some other consulting civil engineer. A report should not be used by other persons for any purpose, or by the client for a different purpose. No individual other than the client should apply a report even apparently for its intended purpose without first conferring with the consultant. No person should apply a report for any purpose other than that originally contemplated without first conferring with the consultant.

### **An ESA Report Is Subject To Misinterpretation**

Costly problems can occur when design professionals develop their plans based on misinterpretations of an ESA. To help avoid these problems, the environmental consultant should be retained to work with appropriate design professionals to explain relevant findings and to review the adequacy of their plans and specifications relative to contamination issues.

### **Logs Should Not Be Separated From The Engineering Report**

Final borehole or test pit logs are developed by environmental scientists, engineers or geologists based upon their interpretation of field logs (assembled by site personnel) and laboratory evaluation of field samples.

Only final logs are customarily included in our reports. These logs should no under any circumstances be redrawn for inclusion in site remediation or other design drawings, because drafters may commit errors or omissions in the transfer process. Although photographic reproduction eliminates this problem, it does nothing to minimise the possibility of contractors misinterpreting the logs during bid preparation. When this occurs, delays, disputes and unanticipated costs are the all-too-frequent result.

To reduce the likelihood of boring log misinterpretation, the complete report must be available to persons or organisations involved in the project, such as contractors, for their use. Those who do not provide such access may proceed under the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing all the available information to persons and organisations such as contractors helps prevent costly construction problems and the adversarial attitudes which may aggravate them to disproportionate scale.

### **Read Responsibility Clauses Closely**

Because an ESA is based extensively on judgement and opinion, it is necessarily less exact than other disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, model clauses have been developed for use in written transmittals. These are not exculpatory clauses designed to foist liabilities onto some other party. Rather, they are definitive clauses which identify where your consultant's responsibilities begin and end. Their use helps all parties involved recognise their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your ESA report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.





**REPORT**

**TO**

**MARK MULLOCK & CO**

**ON**

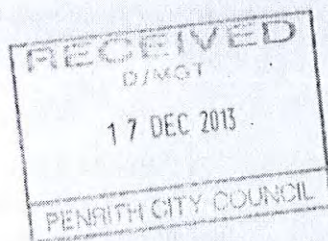
**CONTAMINATION ASSESSMENT**

**FOR**

**POTENTIAL ASBESTOS AND HYDROCARBON CONTAMINATION**

**AT**

**65 - 75 DUNHEVED CIRCUIT, ST MARYS NSW**



**Job No: MAG 1930**

**Report No: ENV AA**

**Our Ref No: 427**

Postal Address: 1/78 Owen Street  
Glendenning NSW 2761

Tel: 02 9675 7522 Fax: 02 9675 7544

Email: [office@comsoiltest.com.au](mailto:office@comsoiltest.com.au)

ABN: 44 106 976 738

Job No: MAG 1930  
Report No: ENV AA  
Our Ref: 427

Mr Ante Maganic  
C/O  
Mark Mulock & Co  
Suite 1, Level 1  
Nepean Walkway Arcade  
374 High Street  
Penrith NSW 2750



Attention: Mr Mark Mulock

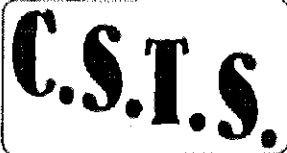
**Potential Asbestos & Hydrocarbon Contamination Report  
65-75 Dunheved Circuit, St Marys NSW**

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Compaction & Soil Testing Services Pty Ltd  
All Rights Reserved

1/78 Owen Street  
Glendenning NSW 2761  
Australia  
ABN 44 106 976 738  
Phone: (02) 9675 7522  
Fax: (02) 9675 7544  
Email: office@comsoiltest.com.au  
Web: www.comsoiltest.com.au

All enquiries regarding this project are to be directed to the undersigned

Document Status		
Author	Co-Author	
 Craig Ridley B. App. Sci. (Environmental Health) Environmental Consultant Compaction & Soil Testing Services Pty Ltd	 Ashleigh Brice B. Environment Environmental Consultant Compaction & Soil Testing Services Pty Ltd	
Revision Number	Status	Date
0	Draft	12 December 2013
1	Final	13 December 2013



## Compaction & Soil Testing Services Pty Limited

1/78 Owen Street, GLENDENNING NSW 2761 • ABN 44 106 976 738

Phone: (02) 9675 7522 Fax: (02) 9675 7544

Email: office@comsoiltest.com.au Web: www.comsoiltest.com.au

### Executive Summary

Compaction & Soil Testing Services Pty Ltd (CSTS) was engaged by Mark Mulock & Co on behalf of Mr Ante Maganic to conduct an assessment of the recycled crushed concrete product which has been placed upon the site known as 65-75 Dunheved Circuit, St Marys NSW. The objective of the assessment was to determine whether the material was impacted by Asbestos. CSTS was also requested to assess two areas of stained material to determine whether fluid spills had contaminated the soils.

In order to achieve the objective, the following scope of work was undertaken;

- Site walkover searching for potential Asbestos Containing Material (ACM),
- Recovery of thirty (30) samples of the recycled crushed concrete product,
- Recovery of two (2) surface samples from the stained areas,
- Comparison of the results of the laboratory analysis to the Health Based Investigation Levels for Commercial / Industrial development,
- Compilation of this contamination assessment report.

The material covers an area of approximately 2ha and consists of crushed concrete, brick, tile and PVC plastic pipes. Limited evidence of foam, rubber and fabric was observed within the material. No fragments of material suspected of containing Asbestos were observed during the investigation. The layer varied in thickness, though was on average approximately 50-100mm thick. The stained areas were approximately 800mm x 500mm and 1300mm x 600mm in size and were assumed to be from a truck and/or trailer stored on the site.

In order to adequately assess the contamination status of the material, samples were recovered and submitted for analysis to a NATA Accredited laboratory. Field and laboratory quality assurance and quality control measures were implemented to ensure the reliability of the results.

No Asbestos fines were detected within any of the samples. TPH F3 and TPH F4 were detected within the samples of the stained material, the concentrations of which were below the HBILs for Commercial / Industrial land use. No concentrations of BTEX, Naphthalene, TPH F1 or TPH F2 were detected within any samples.

Therefore, CSTS concluded the recycled crushed concrete product placed upon the site known as 65-75 Dunheved Circuit, St Marys NSW is of a suitable condition for ongoing Commercial / Industrial land use, from a contamination perspective, in accordance with the *National Environment Protection (Assessment of Site Contamination) Measure 1999 (Amended 2013)* and the *WA DOH Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia; May 2009*.

Should you have any queries about the methodology, findings or recommendations of this investigation, please do not hesitate to contact our office on (02) 9675 7522.

# Compaction & Soil Testing Services Pty Limited

## Table of Contents

Executive Summary.....	I
Abbreviations.....	IV
1 Introduction.....	1
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2 Scope of Works.....	1
3 Site Identification.....	1
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# Compaction & Soil Testing Services Pty Limited

## Abbreviations

ACM	Asbestos Containing Material
AF	Asbestos Fines
BTEX	Benzene, Toluene, Ethyl-benzene, Xylene
CSTS	Compaction & Soil Testing Services Pty Ltd
COAG	Council of Australian Government
DOH	Department of Health
FA	Friable Asbestos
Ha	Hectare
HBIL	Health Based Investigation Levels
IEC	International Electrotechnical Commission
ISO	International Organisation for Standardisation
mg/kg	Milligrams per Kilogram
mm	Millimetre
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council (Now COAG SCEW)
NEPM 1999	National Environment Protection (Assessment of Site Contamination) Measure 1999 (Amended 2013)
NSW	New South Wales
PVC	Polyvinyl Chloride
QA	Quality Assurance
QC	Quality Control
SCEW	Standing Council on Environment and Water
TP	Test Pit
TPH	Total Recoverable Petroleum Hydrocarbons
TPH (F1)	C <sub>8</sub> -C <sub>10</sub> Carbon Fraction TPH minus BTEX
TPH (F2)	>C <sub>10</sub> -C <sub>16</sub> Carbon Fraction TPH minus Naphthalene
TPH (F3)	>C <sub>16</sub> -C <sub>34</sub> Carbon Fraction TPH
TPH (F4)	>C <sub>34</sub> -C <sub>40</sub> Carbon Fraction TPH
USEPA	United States Environment Protection Authority
WA	Western Australia



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## 1 Introduction

### 1.1 Background

Compaction & Soil Testing Services Pty Ltd (CSTS) was engaged by Mark Mulock & Co, on behalf of Mr Ante Maganic to conduct an assessment of the recycled crushed concrete product which had been placed upon the site known as 65-75 Dunheved Circuit, St Marys NSW.

CSTS is of the understanding that a civil dispute has arisen regarding the site, and that this report may be used for evidence. We, Craig Ridley and Ashleigh Brice, have read the Part 31 of Division 2 of the Uniform Civil Rules 2005 and Schedule 7 of the Uniform Civil Procedure Rules 2005. We understand our obligations to the Court and agree to abide by the rules in Part 31 in Schedule 7. We, Craig Ridley and Ashleigh Brice hereby attach our current CVs in Appendix D with the qualifications and experience as set out therein.

### 1.2 Objectives

The objective of this assessment was to determine whether the recycled crushed concrete product placed upon the surface of the site contained Asbestos, and contaminated the site. CSTS was also requested to assess two areas of stained material to determine whether fluid spills had contaminated the soils.

## 2 Scope of Works

In order to achieve the objectives of this assessment, the following scope of works was undertaken;

- Walkover of site with multiple passes searching for potential Asbestos Containing Material (ACM),
- Excavation of thirty (30) test pits within the recycled crushed concrete product,
- Recovery of thirty (30) samples of the fines from the test pits,
- Recovery of two (2) surface samples from the stained areas,
- Transportation of recovered samples to a NATA accredited laboratory for analysis,
- Review of analysis results in comparison to Health Based Investigation Levels (HBILs) for Commercial / Industrial land use as detailed within the *National Environment Protection (Assessment of Site Contamination) Measure 1999 (Amended 2013)*,
- Correlation of data and preparation of this report.

## 3 Site Identification

### 3.1 Site Description

The site under assessment is known as 65-75 Dunheved Circuit, St Marys NSW. The site is bordered by Dunheved Circuit to the east, vacant industrial land to the south, Links Road to the west and a large industrial factory and associated space to the north. The site is 'battle-axed' and an engineering workshop and the Rembrandt Dutch Club occupy the northeast of the site. Refer to Appendix A – Site Location.

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The area under assessment is within the driveway and open area upon which a recycled crushed concrete product has been placed. The assessment area covers an area of approximately 2 Ha. The area CSTS was engaged to assess is detailed within Appendix A – Assessment Area.

## 3.2 Material Description

The material under assessment is the surface covering of the site. Specifically, the assessed material is identified as the imported recycled crushed concrete product used to form an aggregate hardstand. The material appeared to consist of crushed concrete, brick, tile and PVC plastic pipes. Limited evidence of foam, rubber and fabric was observed within the material. No fragments of material suspected of containing Asbestos were observed during the investigation. The layer varied in thickness, though was on average approximately 50-100mm thick. Refer to Photographs A-C within Appendix B.

Within the open area, two (2) small areas of stained material were observed. The stained area was observed to be approximately 800mm x 500mm (ST1) and 1300mm x 600mm (ST2), and based on the location, was assumed to be from a truck and/or trailer stored on the site. A limited quantity of asphalt was observed within Stain 2. Refer to Photographs D-F within Appendix B.

## 4 Sampling Process

### 4.1 Sampling Pattern

In order to provide spatial distribution of sampling locations, a stratified sampling pattern was adopted in accordance with the *NSW EPA Sampling Design Guidelines 1995*. Based on the size of the site, a 26m grid pattern was adopted, with the sampling locations located within the centre of each grid location. This approach was deemed suitable, as Asbestos contamination is heterogeneous, and therefore would not likely be in distinct phases.

Where the centre of the grid was inappropriate for sampling, such as when obstructions were present or the point was not within the recycled crushed concrete product, the sample point was moved within the grid to an available, suitable location. This was the case for a number of test pits, as detailed in Table A.

Refer to Appendix A – Sampling Pattern.

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**Table A: Alterations to the Stratified Sampling Pattern**

Test Pit	Reason for Relocation	Altered Sampling Location <sup>1</sup>
TP101	Asphalt	3m South
TP102	Asphalt	4m South
TP111	Spatial extent of assessed material	3m South; 2m East
TP114	Obstruction	3m West
TP119	Obstruction	4m South
TP121	Obstruction	2m West
TP122	Obstruction	2m East
TP124	Obstruction	4m South
TP128	Obstruction	5m North; 3m West
TP129	Obstruction	3m East

1. As measured from the planned sampling point at the centre of the grid square

## 4.2 Sampling Technique

Sampling was undertaken in accordance with AS 4482.1 – 2005 – Guide to the investigation and sampling of sites with potentially contaminated soil – Part 1: Non-volatile and semi-volatile compounds, AS 4482.2 – 1999 – Guide to the sampling and investigation of potentially contaminated soil – Part 2: Volatile substances and current industry guidelines.

At each sampling location, a test pit was excavated by a representative of the client using a back-hoe to the depth of the recycled crushed concrete, that is, approximately 50-100mm. A sample was recovered using disposable latex gloves to transfer a portion of the fines into a food-grade 'snap lock' sample bag. The sample was sealed and labelled with a job number and sample ID before being transferred to a chilled container. Once the sample had been recovered, the test pit was re-filled with the excavated material in accordance with Work Health and Safety requirements.

At each stain, a decontaminated stainless steel trowel was used to transfer a portion of the surface material into a laboratory supplied 250mL glass jar with Teflon seal lid. The sample was sealed and labelled with a job number and sample ID before being transferred into a chilled container to begin the cool down process as required prior to chemical analysis of the soil.

When all the samples had been recovered, the chilled container was sealed and transported to SGS Australia Pty Ltd under stringent chain of custody procedures. SGS Australia Pty Ltd is a laboratory accredited by NATA (Accreditation Number 2562) and was chosen to undertake the chemical analysis due to their past experience with this form of analysis. Upon receipt of the samples, a technician from SGS Australia Pty Ltd checked the samples to confirm their condition, including the integrity of the sample jar seals. When satisfied the samples were received in an appropriate condition as required under current Australian Standards, SGS Australia Pty Ltd returned a Sample Receipt. Laboratory Documentation is located within Appendix C.

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## 5 Field Quality Assurance and Quality Control

### 5.1 Sampling Team

Sampling was conducted by Mr Craig Ridley and Ms Ashleigh Brice, Environmental Consultants from Compaction & Soil Testing Services Pty Ltd on 04 December 2013. Therefore, the samples were deemed to be recovered by suitably qualified and experienced samplers.

### 5.2 Decontamination Process

To minimise the potential for cross-contamination to occur during the sampling process, a new set of disposable latex gloves was used to recover each sample. In addition, the trowel used to sample the stained material was decontaminated prior to the recovery of both samples. The decontamination process is as follows;

- Remove soils adhering to the object by scrubbing with a clean, soft bristled brush,
- Thoroughly wash the equipment in a solution of 3% phosphate-free detergent (Decon 90),
- Thoroughly rinse the equipment in either distilled water or portable water, depending on availability,
- Dry the equipment with a clean cloth or terry towel.

### 5.3 Sample Preservation

To ensure the reliability of the results obtained, the samples were analysed in accordance with the appropriate holding periods detailed within the *NEPM 1999 (Amended 2013)* published by the NEPC. The samples were preserved in accordance with *NEPM 1999 (Amended 2013)* as detailed in Table B.

**Table B: Recommended Holding Times & Sample Preservations**

Analyte	Holding Time	Container	Preservation
Asbestos	Indefinite	Sealed bag, Double bagged	N/A
BTEX	14 days	Glass with PTFE-lined lid	Chilled, No Headspace
TPH	14 days	Glass with PTFE-lined lid	Chilled, No Headspace
Naphthalene	14 days	Glass with PTFE-lined lid	Chilled, No Headspace

Adapted from *National Environment Protection (Assessment of Site Contamination) Measure 1999 (Amended 2013)*

### 5.4 Detailed Site Records

Detailed site records were created during the site assessment. These records consisted of written records and photographs including details of locations, material condition and samples. The samples were transferred to the laboratory in accordance with stringent chain of custody procedures with appropriate documentation (Appendix C).

### 5.5 Field Quality Control Samples

No field QA/QC samples were recovered or analysed, as this was beyond the scope of works. Field QA/QC relied upon the measures outlined within Sections 5.1-5.4.

### 5.6 Field QA/QC Evaluation

Due to the compliance and extent of field Quality Assurance and Quality Control measures, CSTS considers the field procedure was adequate and the results obtained reliable and useable for the expressed purpose.

# Compaction & Soil Testing Services Pty Limited

## 6 Laboratory Quality Assurance and Quality Control

SGS Australia Pty Ltd is registered by NATA for Chemical Testing and Quality System compliance to ISO/IEC 17025 (Accreditation Number 2562). For this reason they were deemed as suitably qualified to conduct the assessment of these soil samples.

### 6.1 Quality Control Samples

As a NATA accredited laboratory, SGS Australia Pty Ltd must conform to a variety of quality assurance procedures. Quality control samples included in any analytical run are listed below.

#### 6.1.1 Reagent/Analysis Blank & Method Blank

Sample free reagents carried through the preparation/extraction/digestion procedure and analysed at the beginning of every sample batch analysis. A reagent blank is prepared and analysed with every batch of samples plus with each new batch of solvent prior to use.

#### 6.1.2 Sample Matrix Spike & Matrix Spike Duplicate

Sample replicates spiked with identical concentrations of target analyte(s). The spiking occurs during the sample preparation and prior to the extraction/digestion procedure. They are used to document the precision and bias of a method in a given sample matrix. Where there is not enough sample available to prepare a spiked sample, another known soil/sand or water may be used. A duplicate spiked sample is analysed at least every 20 samples.

#### 6.1.3 Surrogate Spike

Used to determine the extraction efficiency, surrogate spikes are organic compounds which are similar to the target analyte(s) in chemical composition and behaviour in the analytical process, but which are not normally found in environmental samples. Where possible they are surrogate compounds recommended by the USEPA. At least one, but up to three, surrogate compounds are added to all samples requiring analysis for organics prior to extraction.

#### 6.1.4 Control Matrix Spike

To ensure spike recoveries can be determined for every batch of samples a control matrix is spiked with identical concentrations of target analyte(s) and then analysed. These results allow recoveries to be determined in the event that the matrix spikes are unusable (eg. Matrix spikes performed on heavily contaminated samples). These are analysed at least every 20 samples.

#### 6.1.5 Internal Standard

Added to all samples requiring analysis for organics (where relevant) after the extraction process; the compounds serve to give a standard of retention time and response, which is invariant from run-to-run with the instruments. Where possible they are standard compounds recommended by the USEPA.

#### 6.1.6 Lab Duplicates

A separate portion of a sample being analysed that is treated the same as the other samples in the batch. One duplicate is processed at least every 10 samples.

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## 6.1.7 Lab Control Samples

Prepared from a source independent of the calibration standards, at least one control standard is included in each run to confirm calibration validity. Thereafter they are analysed at least every one in 20 samples plus at the end of each analytical run.

## 6.1.8 Continuous Calibration Verification

A calibration check standard or continuous calibration standard and blank are run after every 20 samples of an instrumental analysis run to assess analytical drift. Calibration standards are checked old versus new with a criteria of  $\pm 20\%$ .

## 6.2 Quality Assurance Programs

### 6.2.1 Statistical Analysis of Quality Control Data

Quality control data is plotted on control charts using the APHA procedure with warning and control limits at 2 and 3 standard deviations respectively.

### 6.2.2 Certified Reference Materials

Certified Reference Materials and Standards are analysed for method validation. These materials/standards have certified reference values for various parameters and may also be used for method troubleshooting.

### 6.2.3 Proficiency Testing

Regular proficiency test samples are analysed by our laboratories. SGS Australia Pty Ltd participates in a number of programs. Results and proficiency status are compiled and sent to participating laboratory post data interpretation. Failure to comply with acceptable values results in further investigation.

### 6.2.4 Inter-laboratory & Intra-laboratory Testing

SGS Australia Pty Ltd has schedules in the Quality Systems to participate in Inter/Intra laboratory testing conducted internally and by other parties.

## 6.3 Laboratory QA/QC Evaluation

CSTS has checked the QA/QC procedures adopted by the laboratory against the appropriate guidelines. The quality control sample numbers adopted by SGS Australia Pty Ltd are considered to be adequate for the analyses undertaken and conform to the recommendations provided in *NEPM 1999 (Amended 2013)*.

Overall, the quality control elements indicate that the analytical data fall within acceptable levels of accuracy and precision for the analysis of soils and water. The analytical data provided is therefore considered reliable and useable for this assessment.

## 7 Assessment Criteria

As the assessment was based upon the potential for Asbestos contamination to be evident within the imported material, the material was assessed for Asbestos presence. Furthermore, two (2) areas of stained material were observed, which were assessed for the presence of hydrocarbons associated with petroleum products. Provided the concentrations detected were within the assessment criteria detailed in Table B, the site can be considered suitable for the ongoing industrial land-use.

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Table C: Assessment Criteria

Analyte	Assessment Criteria (HIL – D)
Asbestos	No Visible Asbestos at Surface 0.001% w/w for FA & AF 0.05% w/w asbestos for ACM
Benzene	3 <sup>1</sup> / 430 <sup>2</sup>
Toluene	NL <sup>1</sup> / 99,000 <sup>2</sup>
Ethyl-benzene	NL <sup>1</sup> / 27,000 <sup>2</sup>
Xylene	NL <sup>1</sup> / 81,000 <sup>2</sup>
Naphthalene	NL <sup>1</sup> / 11,000 <sup>2</sup>
TPH (F1)	NL <sup>1</sup> / 26,000 <sup>2</sup>
TPH (F2)	NL <sup>1</sup> / 20,000 <sup>2</sup>
TPH (F3)	27,000 <sup>2</sup>
TPH (F4)	38,000 <sup>2</sup>

Adapted from National Environment Protection (Assessment of Site Contamination) Measure 1999 (Amended 2013) and WA DOH Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia; May 2009.

Notes:

(A): FA – Friable Asbestos; AF – Asbestos Fines; ACM – Asbestos Containing Material; NL – Not Limiting

1. Soil Vapour Intrusion Value
2. Direct contact HSL

## 8 Results of Laboratory Analysis

The laboratory analysis was undertaken by experienced technicians from SGS Australia Pty Ltd in accordance with relevant Australian Standards, government guidelines and the conditions of their NATA accreditation.

### 8.1 Asbestos

No Asbestos fines were detected within any of the samples. The estimated fibres present within each sample were less than 0.01%w/w (Table D). These values are below the assessment criteria, and as such, the material is considered unaffected by Asbestos.

### 8.2 Hydrocarbons

The chemical analysis detected TPH F3 and TPH F4 within the samples recovered from both stained areas within the site (Table D). The concentrations detected were below the HBILs for Commercial / Industrial development, and as such, the presence of these contaminants will not affect the suitability of the property for the ongoing Commercial / Industrial use.

No concentrations of Benzene, Toluene, Ethyl-benzene, Xylene, Naphthalene, TPH F1 or TPH F2 were detected within any of the samples (Table D), and as such, will not affect the suitability of the site for the ongoing Commercial / Industrial use.

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**Table D: Laboratory Analysis**

Sample	Asbestos (%w/w)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Xylene (mg/kg)	Naphthalene (mg/kg)	TPH - F1 (mg/kg)	TPH - F2 (mg/kg)	TPH - F3 (mg/kg)	TPH - F4 (mg/kg)
TP101	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP102	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP103	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP104	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP105	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP106	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP107	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP108	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP109	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP110	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP111	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP112	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP113	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP114	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP115	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP116	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP117	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP118	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP119	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP120	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP121	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP122	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP123	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP124	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP125	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP126	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP127	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP128	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP129	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP130	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
ST-1	NT	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL <sup>1</sup>	16,000	4,500
ST-2	NT	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL <sup>2</sup>	22,000	13,000

Adapted from SGS Australia Pty Ltd, Analytical Report SE122986 (Appendix C)

Notes: NT – Not tested, Bolded & Shaded = exceeds the assessment criteria

1. Limit of reporting raised by SGS Australia Pty Ltd to 130mg/kg
2. Limit of reporting raised by SGS Australia Pty Ltd to 250mg/kg

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## 9 Conclusions & Recommendations

Based on the conducted assessment, CSTS drew the following conclusions:

- The assessment area covers an area of approximately 2ha within the site known as 65-75 Dunheved Circuit, St Marys NSW,
- The material under investigation consists of imported recycled crushed concrete product consisting of concrete, brick, tile and PVC plastic pipes. Limited evidence of foam, rubber and fabric was observed,
- The material was approximately 50-100mm thick on average,
- Two small areas of stained material were observed approximately 800mm x 500mm and 1300mm x 600mm in size,
- No material suspected of containing Asbestos was observed during the investigation,
- No Asbestos fines were detected within any of the samples,
- TPH F3 and TPH F4 were detected within the samples of the stained material, the concentrations of which were below the HBILs for Commercial / Industrial land use,
- No concentrations of BTEX, Naphthalene, TPH F1 or TPH F2 were detected within any samples.

Therefore, CSTS concluded the recycled crushed concrete product placed upon the site known as 65-75 Dunheved Circuit, St Marys NSW is of a suitable condition for ongoing Commercial / Industrial land use, from a contamination perspective, in accordance with the *National Environment Protection (Assessment of Site Contamination) Measure 1999 (Amended 2013)* and the *WA DOH Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia; May 2009*.

Should you have any queries about the methodology, findings or recommendations of this investigation, please do not hesitate to contact our office on (02) 9675 7522.

# Compaction & Soil Testing Services Pty Limited

## 10 Limitations

This classification covers **ONLY** the crushed recycled concrete product placed upon the surface of the property known as 65-75 Dunheved Circuit, St Marys NSW. No other material is covered under this classification.

This report covers the site at the time of sampling. Should there be any variations in site conditions since the above mentioned date such as importation of fill, chemical spillage, illegal dumping, the detection of suspected ACM etc, further assessment will be required. Should any suspect materials be encountered, we recommend that this office be contacted immediately for further assessment. Neither Compaction & Soil Testing Services Pty Ltd nor any other reputable firm can give unqualified warranties on the conditions of the site and subsurface conditions.

While Compaction & Soil Testing Services Pty Ltd takes all reasonable due care and diligence, we offer no absolute warranty for the material between the locations sampled and investigated. In addition, Compaction & Soil Testing Services Pty Ltd does not assume any liability for site conditions unobserved or inaccessible at the time of the investigation.

This report has been prepared for the particular project described and no responsibility is accepted for the use of any part of this report in any other context or for any other purpose. If there is any change in the proposed development described in the report then all recommendations should be reviewed. No other warranty expressed or implied is made or intended. Copyright on this report remains the property of Compaction & Soil Testing Services Pty Ltd.

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If you have any queries about this investigation please do not hesitate to contact our office on (02) 9675 7522.

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## 11 References

National Environment Protection Council, 2013, *National Environment Protection (Assessment of Site Contamination) Measure 1999*

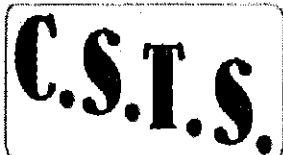
New South Wales Environment Protection Authority, 1995, *Sampling Design Guidelines 1995*

SGS Australia Pty Ltd, 12 December 2013, *Analytical Report SE122986*, prepared for Compaction & Soil Testing Services Pty Ltd

Standards Australia, 2005, AS 4482.1 – 2005 – *Guide to the investigation and sampling of sites with potentially contaminated soil – Part 1: Non-volatile and semi-volatile compounds*

Standards Australia, 1999, AS 4482.2 – 1999 – *Guide to the sampling and investigation of potentially contaminated soil – Part 2: Volatile substances and current industry guidelines*

Western Australian Government Department of Health, 2009, *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia; May 2009*



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### **Appendix A**

#### **Site Location**



Sourced: [www.nearmap.com](http://www.nearmap.com) under licence to Compaction & Soil Testing Services Pty Ltd 2013. Imagery date, 02 September 2013

**Compaction and Soil Testing Services Pty Ltd**

**CSTS**

Notes: This drawing has been produced using a base plan provided by others to which additional information e.g.; density test, DCP and Test Pit locations or notes have been added. Some or all the information shown on the plan may not be relevant at the time of producing this drawing.

Drawn:	CR
Approved:	CR
Date:	05/12/2013
Scale:	As Shown

Site Location  
65-75 Dunheved Circuit  
St Marys NSW

Job No.	MAG 193D
Drawing No.	ENV AA001

Form No: WS 014

01/06/2010

Issued No.1.1

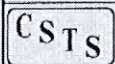
Issued By: PC



Showing 2 Sep 2013  
 20 m  
 100 ft

Sourced: [www.heatmap.com](http://www.heatmap.com) under licence to Compaction & Soil Testing Services Pty Ltd 2013, Imagery date, 02 September 2013

**Compaction and Soil Testing Services Pty Ltd**



Notes: This drawing has been produced using a base plan provided by others to which additional information e.g. density test, DCP and Test P1 locations or notes have been added. Some or all the information shown on the plan may not be relevant at the time of producing this drawing.

Drawn:	CR
Approved:	CR
Date:	05/12/2013
Scale:	As Shown

Assessment Area  
 65-75 Dunheved Circuit  
 St Marys NSW

Job No:	MAG 1930
Drawing No:	ENV AA002

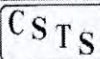


Showing 2 Sep 2013



Sourced: [www.nes1map.com](http://www.nes1map.com) under licence to Compaction & Soil Testing Services Pty Ltd 2013, imagery date, 02 September 2013

**Compaction and Soil Testing Services Pty Ltd**



*Notes: This drawing has been produced using a base plan provided by others to which additional information e.g.: density test, DCP and Test Pit locations or notes have been added. Some or all the information shown on the plan may not be relevant at the time of producing this drawing.*

Drawn:	CR
Approved:	CR
Date:	05/12/2013
Scale:	As Shown

**Sampling Locations**  
65-75 Dunheved Circuit  
St Marys NSW

Job No:	MAG 1930
Drawing No:	ENV AA003

Form No.WS 014

01/05/2010

Issued No.1.1

Issued By:PC



## **Compaction & Soil Testing Services Pty Limited**

1/78 Owen Street, GLENDENNING NSW 2761 • ABN 44 106 976 738

Phone: (02) 9675 7522 Fax: (02) 9675 7544

Email: [office@comsoiltest.com.au](mailto:office@comsoiltest.com.au) Web: [www.comsoiltest.com.au](http://www.comsoiltest.com.au)

### **Appendix B**

#### **Site Photographs**



2013/12/04 09:47

A: Site Condition – taken from the north western portion of the site, looking south east



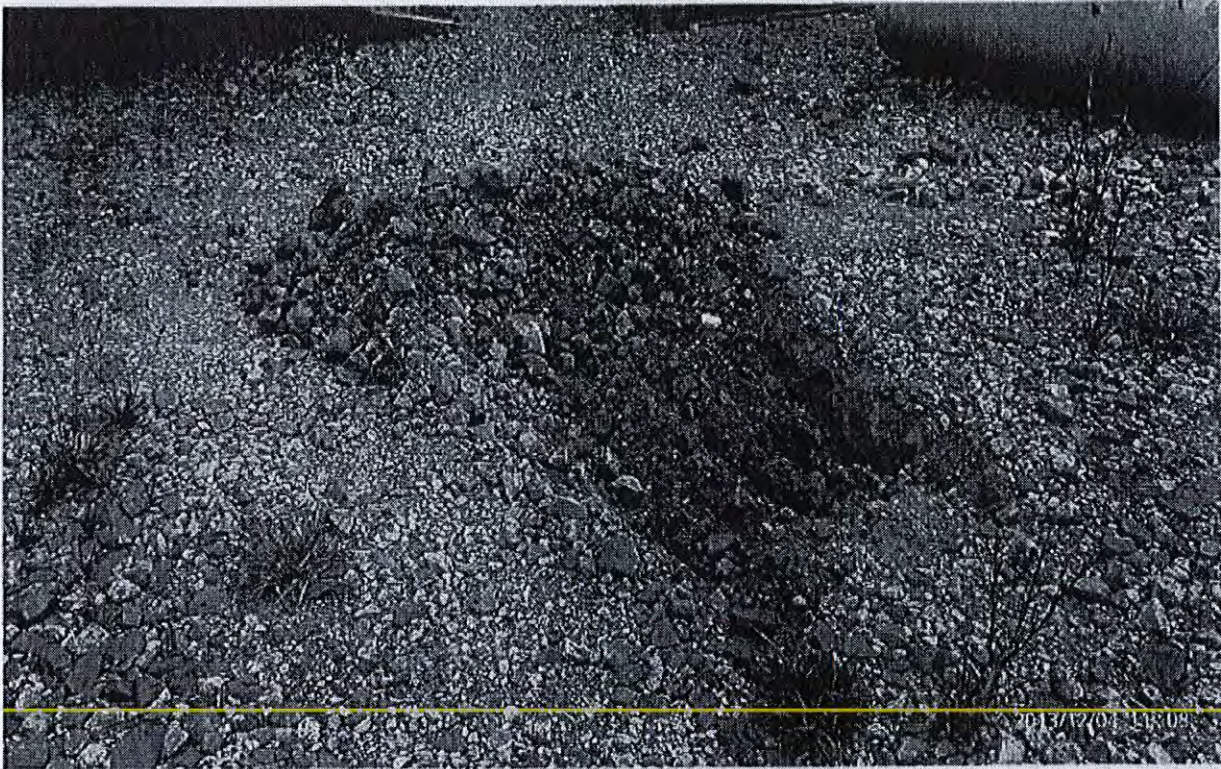
2013/12/04 10:22

B: Recycled Crushed Concrete; marked sampling location; TP119

Photographs Taken by CSTS Environmental Consultant 04/12/2013

**Compaction and Soil Testing Services Pty Ltd**

	<i>Notes: This drawing has been produced using a base plan provided by others to which additional information e.g.: density test, DCP and Test Pit locations or notes have been added. Some or all the information shown on the plan may not be relevant at the time of producing this drawing</i>		Drawn:	AB	<b>Site Photographs</b> 65-75 Dunheved Circuit St Marys NSW	Drawing No:	ENV AA004
			Approved:	CR		Job No:	<b>MAG 1930</b>
			Date:	09/12/2013			
			Scale:	Not to scale			



C: Excavated Test Pit; TP122



D: Stain 1

Photographs Taken by CSTS Environmental Consultant 04/12/2013

**Compaction and Soil Testing Services Pty Ltd**

	<i>Notes: This drawing has been produced using a base plan provided by others to which additional information e.g.: density test, DCP and Test Pit locations or notes have been added. Some or all the information shown on the plan may not be relevant at the time of producing this drawing</i>		Drawn:	AB	<b>Site Photographs</b> 65-75 Dunheved Clrcuit St Marys NSW	Drawing No:	ENV AA005
			Approved:	CR		Job No:	MAG 1930
			Date:	09/12/2013			
			Scale:	Not to scale			



E: Stain 2



F: Stain 2 - Asphalt

Photographs Taken by CSTS Environmental Consultant 04/12/2013

**Compaction and Soil Testing Services Pty Ltd**

	Notes: This drawing has been produced using a base plan provided by others to which additional information e.g. density test, DCP and Test Pit locations or notes have been added. Some or all the information shown on the plan may not be relevant at the time of producing this drawing.	Drawn:	AB	Site Photographs 65-75 Dunheved Circuit St Marys NSW	Drawing No:	ENV AA006
		Approved:	CR		Job No:	MAG 1930
		Date:	09/12/2013			
		Scale:	Not to scale			



## **Compaction & Soil Testing Services Pty Limited**

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### **Appendix C**

#### **Laboratory Documentation**

### CHAIN OF CUSTODY & ANALYSIS REQUEST

Page 1 of 4

**SGS Environmental Services**  
 Unit 16, 33 Maddox Street  
 Alexandria NSW 2015  
 Telephone No: (02) 85940400  
 Facsimile No: (02) 85940488  
 Email: IRFAN.SAYEED@SGS.COM

Company Name:	Compaction & Soil Testing Services Pty Ltd	Project Name/No:	Dunbeved
Address:	1/78 Owen Street Glendenning NSW 2761	Purchase Order No:	
Contact Name:	Craig Ridley	Results Required By:	STA
		Telephone:	(02) 9675 7522
		Facsimile:	(02) 9675 7544
		Email Results:	office@comsoiltest.com.au / craig@comsoiltest.com.au

Client Sample ID	Date Sampled	Lab Sample ID	WATER	SOIL	PRESERVATIVE	NO OF CONTAINERS	Asbestos	TRHC6-C408TEAN																		
TP101	4/12/2013	1		X			X																			
TP 102	4/12/2013	2		X			X																			
TP 103	4/12/2013	3		X			X																			
TP 104	4/12/2013	4		X			X																			
TP 105	4/12/2013	5		X			X																			
TP 106	4/12/2013	6		X			X																			
TP 107	4/12/2013	7		X			X																			
TP 108	4/12/2013	8		X			X																			
TP 109	4/12/2013	9		X			X																			

Received By: [Signature]  
 Date: 4/12/13  
 Time: 4:45  
 Sample Intact: Yes  
 Temp/Cooler Sealed: Yes  
 Temperature on Receipt: 18.5  
 Storage Location: ASB 545  
 SGS Ref No: SGS12295

Relinquished By: CSTS	Date/Time: <u>4:45 4/12</u>	Received By: <u>[Signature]</u>	Date/Time: <u>4/12/13 4:45</u>
Relinquished By:	Date/Time:	Received By:	Date/Time:
Samples Intact: <u>Yes</u> / No	Temperature: Ambient <u>Cooled</u>	Sample Cooler Sealed: <u>Yes</u> / No	Laboratory Quotation No: ENVI-27CSRE-v3
Comments:			

### CHAIN OF CUSTODY & ANALYSIS REQUEST

Page 2 of 4

**SGS Environmental Services**  
**Unit 16, 33 Maddox Street**  
**Alexandria NSW 2015**  
 Telephone No: (02) 85940400  
 Facsimile No: (02) 85940499  
 Email: IRFAN.SAYEED@SGS.COM

Company Name:	Compaction & Soil Testing Services Pty Ltd	Project Name/No:	Dunheved
Address:	1/78 Owen Street Glendenning NSW 2781	Purchase Order No:	
Contact Name:	Craig Ridley	Results Required By:	STA
		Telephone:	(02) 9675 7522
		Facsimile:	(02) 9675 7544
		Email Results:	office@comsoiltest.com.au / craig@comsoiltest.com.au

Client Sample ID	Date Sampled	Lab Sample ID	WATER	SOIL	PRESERVATIVE	NO OF CONTAINERS	Asbestos	TRHOC-COUREXIN															
TP110	4/12/2013	10		X			X																
TP 111	4/12/2013	11		X			X																
TP 112	4/12/2013	12		X			X																
TP 113	4/12/2013	13		X			X																
TP 114	4/12/2013	14		X			X																
TP 115	4/12/2013	15		X			X																
TP 116	4/12/2013	16		X			X																
TP 117	4/12/2013	17		X			X																
TP 118	4/12/2013	18		X			X																
Relinquished By: CSTS			Date/Time:					Received By: <i>[Signature]</i>					Date/Time: 04/12/13										
Relinquished By:			Date/Time:					Received By:					Date/Time										
Samples Intact: <input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No			Temperature: Ambient / <input checked="" type="checkbox"/> Chilled					Sample Cooler Sealed: <input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No					Laboratory Quotation No: ENVI-27CSRE-v3										
Comments:																							

Uncontrolled template when printed

### CHAIN OF CUSTODY & ANALYSIS REQUEST

Page 4 of 4

**SGS Environmental Services**  
 Unit 16, 33 Maddox Street  
 Alexandria NSW 2015  
 Telephone No: (02) 85940400  
 Facsimile No: (02) 85940499  
 Email: IRFAN.SAYEED@SGS.COM

Company Name:	Compaction & Soil Testing Services Pty Ltd	Project Name/No:	Dunheved
Address:	1/78 Owen Street	Purchase Order No.:	
	Glendenning NSW 2761	Results Required By:	STA
Contact Name:	Craig Ridley	Telephone:	(02) 9675 7522
		Facsimile:	(02) 9675 7544
		Email Results:	office@oomsoiltest.com.au / craig@oomsoiltest.com.au

Client Sample ID	Date Sampled	Lab Sample ID	WATER	SOIL	PRESERVATIVE	NO OF CONTAINERS	Asbestos		TRHCS-C400B/TEXN											
TP128	4/12/2013	28		X			X													
TP 129	4/12/2013	29		X			X													
TP 130	4/12/2013	30		X			X													
ST1	4/12/2013	31		X				X												
ST2	4/12/2013	32		X				X												

Relinquished By: CSTS	Date/Time:	Received By: <i>[Signature]</i>	Date/Time: 02/12
Relinquished By:	Date/Time:	Received By:	Date/Time:
Samples Intact: <i>Yes</i> /No	Temperature: Ambient / <i>Chilled</i>	Sample Cooler Sealed: <i>Yes</i> /No	Laboratory Quotation No: ENVI-27CSRE-v3
Comments:			



AUSTRALIA - ENVIRONMENTAL SERVICES SYDNEY - PROFORMA FORM  
SAMPLE INFORMATION

Approved: D. Liang

JOB No. SR 122982

Sample No.	P 100ml UP	P 250ml UP	P 500ml UP	P 1L UP	G 100 Amber UP	G 200 Amber UP	G 500 Amber UP	G 1L Amber UP	G 40ml vial UP	G 40ml Vial HCl	P 100ml HCl	G 40ml Vial H2SO4	P 100ml H2SO4	P 250ml H2SO4	G 500ml Amber H2SO4	G 1L H2SO4	P 100/250ml HN03 Total	P 100ml HN03 Filtered	P 250ml NaOH	P 250ml Zn Acetate	Plastic Bag	G 250ml Soil Jar	Sample Matrix	Lab Bottles Supplied By	Comments
1-33																							Soil	Client	100g
31-32																							2	Soil	100g



## SAMPLE RECEIPT ADVICE

SE122986

### CLIENT DETAILS

Contact: **Craig Ridley**  
Client: **Compaction and Soil Testing Services Pty Ltd**  
Address: **Unit 1 / 78 Owen St  
GLENDEENING NSW 2761**

Telephone: **02 9675 7522**  
Facsimile: **02 9675 7544**  
Email: **craig@comsoiltest.com.au**

Project: **Dunheved**  
Order Number: **(Not specified)**  
Samples: **32**

### LABORATORY DETAILS

Manager: **Huong Crawford**  
Laboratory: **SGS Alexandria Environmental**  
Address: **Unit 16, 33 Maddox St  
Alexandria NSW 2015**

Telephone: **+61 2 8594 0400**  
Facsimile: **+61 2 8594 0499**  
Email: **au.environmental.sydney@sgs.com**

Samples Received: **Wed 4/12/2013**  
Report Date: **Thu 12/12/2013**  
SGS Reference: **BE122986**

### WORKSHEET DETAILS

This is to confirm that 32 samples were received on Wednesday 4/12/2013. Results are expected to be ready by Thursday 12/12/2013. Please quote SGS reference SE122986 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Sample counts by matrix	32 Soils	Type of documentation received	COC
Date documentation received	4/12/2013	Samples received in good order	Yes
Samples received without headspace	N/A	Sample temperature upon receipt	4.3°C
Sample container provider	Client	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes		

Samples will be held for one month for water samples and two months for soil samples from date of report, unless otherwise instructed.

### COMMENTS

Samples received at SGS on 4/12/2013@4.45pm. Samples were not registered until the next working day.

To the extent not inconsistent with the other provisions of this document and unless specifically agreed otherwise in writing by SGS, all SGS services are rendered in accordance with the applicable SGS General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions/General-Conditions-of-Services-English.aspx> as at the date of this document. Attention is drawn to the limitations of liability and to the clauses of indemnification.

Environmental Services Unit 16 33 Maddox St Alexandria NSW 2015 Australia t +61 2 8594 0400 f +61 2 8594 0499 www.au.sgs.com  
PO Box 6432 Bourke Rd BC Alexandria NSW 2015 Australia

Member of the SGS Group



# SAMPLE RECEIPT ADVICE

SE122986

CERTEL 0015

Client: Compaction and Soil Testing Services Pty Ltd

Project: Dunheved

## SUMMARY OF ANALYSIS

No.	Sample ID	Flame Identification: In soil
001	TP 101	2
002	TP 102	2
003	TP 103	2
004	TP 104	2
005	TP 105	2
006	TP 106	2
007	TP 107	2
008	TP 108	2
009	TP 109	2
010	TP 110	2
011	TP 111	2
012	TP 112	2
013	TP 113	2
014	TP 114	2
015	TP 115	2
016	TP 116	2
017	TP 117	2
018	TP 118	2
019	TP 119	2
020	TP 120	2
021	TP 121	2
022	TP 122	2
023	TP 123	2
024	TP 124	2

The above table represents SGS Environmental Services' interpretation of the client-supplied Chain Of Custody document. The numbers shown in the table indicate the number of results requested in each package. Please indicate as soon as possible should your request differ from these details. Testing as per this table shall commence immediately unless the client intervenes with a correction.

CERTEL 0015



# SAMPLE RECEIPT ADVICE

SE122986

**CLIENT DETAILS**

Client: **Compaction and Soil Testing Services Pty Ltd**

Project: **Dunhaved**

**SEQUENCE OF ANALYSIS**

No.	Sample ID	Fibre Identification in soil	Moisture Content	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
025	TP 125	2	-	-	-	-
026	TP 125	2	-	-	-	-
027	TP 127	2	-	-	-	-
028	TP 128	2	-	-	-	-
029	TP 129	2	-	-	-	-
030	TP 130	2	-	-	-	-
031	ST1	-	1	9	12	8
032	ST2	-	1	9	12	8

The above table represents SGS Environmental Services' interpretation of the client-supplied Chain Of Custody document. The numbers shown in the table indicate the number of results requested in each package. Please indicate as soon as possible should your request differ from these details. Testing as per this table shall commence immediately unless the client intervenes with a correction.



# ANALYTICAL REPORT

# NATA

WORLD RECOGNISED  
ACCREDITATION

## CLIENT DETAILS

Contact: Craig Ridley  
Client: Compaction and Soil Testing Services Pty Ltd  
Address: Unit 1 / 78 Owen St  
GLENDENNING NSW 2781

## LABORATORY DETAILS

Manager: Huong Crawford  
Laboratory: SGS Alexandria Environmental  
Address: Unit 16, 33 Maddox St  
Alexandria NSW 2015

Telephone: 02 9675 7522  
Facsimile: 02 9675 7544  
Email: craig@comsoiltest.com.au

Project: Dunhaved  
Order Number: (Not specified)  
Samples: 32  
Date Received: 4/12/2013

Telephone: +61 2 8594 0400  
Facsimile: +61 2 8594 0499  
Email: au.environmental.sydney@sgs.com

SGS Reference: SE122986 R0  
Report Number: 0000071720  
Date Reported: 12/12/2013

## COMMENTS

Accredited for compliance with ISO/IEC 17025, NATA accredited laboratory 2562(4354).

TRH - The Limit of Reporting (LOR) has been raised due to interferences from the sample matrix.

No respirable fibres detected in all samples using trace analysis technique.  
Asbestos analysed by Approved Identifier Ravee Sivasubramaniam.

## SIGNATURES

Andy Sutton  
Senior Organic Chemist

Huong Crawford  
Production Manager

Ly Kim Ha  
Organic Section Head

Ravee Sivasubramaniam  
Asbestos Analyst



# ANALYTICAL RESULTS

SE122986 R0

VOCs in Soil [AH133-AH134]

PARAMETER	UOM	LOQ	BT1	BT2
			SOIL 4/12/2013 SE122986.011	SOIL 4/12/2013 SE122986.012
Benzene	mg/kg	0.10	<0.1	<0.1
Toluene	mg/kg	0.10	<0.1	<0.1
Ethylbenzene	mg/kg	0.10	<0.1	<0.1
m/p-xylene	mg/kg	0.20	<0.2	<0.2
o-xylene	mg/kg	0.10	<0.1	<0.1
Total Xylenes*	mg/kg	0.30	<0.3	<0.3
Total BTEX*	mg/kg	0.60	<0.6	<0.6
Naphthalene	mg/kg	0.10	<0.1	<0.1



# ANALYTICAL RESULTS

SE122986 R0

Volatile Petroleum Hydrocarbons in Soil (AN133/AN134/AJ1516)

PARAMETER	UOM	LOH	ST1	ST2
			SOIL 4/12/2013 SE122986.031	SOIL 4/12/2013 SE122986.032
TRH C5-C8	mg/kg	20	<20	<20
Benzene (B)	mg/kg	0.10	<0.1	<0.1
TRH C6-C10	mg/kg	25.0	<25	<25
TRH C5-C10 minus BTEX (F1)	mg/kg	25.0	<25	<25



# ANALYTICAL RESULTS

SE122986 R0

TRH (Total Petroleum Hydrocarbons) in Soil (ANd03)

PARAMETER	UOM	LOL	BT1	BT2
			SOIL 4/12/2013 SE122986.031	SOIL 4/12/2013 SE122986.032
TRH C10-C14	mg/kg	20	<1001	<2001
TRH C15-C20	mg/kg	45.0	9000	9000
TRH C20-C36	mg/kg	45.0	9400	19000
TRH C37-C40	mg/kg	100	1900	8000
TRH >C10-C16 (F2)	mg/kg	25.6	<1301	<2501
TRH >C18-C34 (F3)	mg/kg	90	18000	22000
TRH >C34-C40 (F4)	mg/kg	120	4500	13000
TRH C10-C36 Total	mg/kg	110	18000	29000
TRH C10-C40 Total	mg/kg	210	20000	35000





ANALYTICAL RESULTS

SE122986 R0

Moisture Content (AF100)

PARAMETER	UOM	ST1	ST2
% Moisture	%	0.50	3.1



METHOD SUMMARY

SE122986 R0

METHOD

DETERMINATION SUBSTANCE

- AN002 The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
- AN088 Orbital rolling for Organic pollutants are extracted from soil/sediment by transferring an appropriate mass of sample to a clear soil jar and extracting with 1:1 Dichloromethane/Acetone. Orbital Rolling method is intended for the extraction of semi-volatile organic compounds from soil/sediment samples, and is based somewhat on USEPA method 3570 (Micro Organic extraction and sample preparation), Method 3700.
- AN403 Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C8-C9, C10-C14, C15-C28 and C29-C38 and in recognition of the Draft NEPM 2011, >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is not corrected for Naphthaleno.
- AN433/AN434 VOCs and C8-C9 Hydrocarbons by GC-MS P&T: VOC's are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
- AN433/AN434/AN410 VOCs and C8-C9/C8-C10 Hydrocarbons by GC-MS P&T: VOC's are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
- AN602 Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic 'clues', which provide a reasonable degree of certainty, dispersion staining is a mandatory 'clue' for positive identification. If sufficient 'clues' are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.

FOOTNOTES

*	Analysis not covered by the scope of accreditation.	-	Not analysed.	UOM	Unit of Measure.
**	Indicative data, theoretical holding time exceeded.	NVL	Not validated.	LOR	Limit of Reporting
^	Performed by outside laboratory.	IS	Insufficient sample for analysis.		Raised/Lowered Limit of Reporting
		LNR	Sample listed, but not received.		

Samples analysed as received.  
Solid samples expressed on a dry weight basis.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: <http://www.sgs.com.au/pv.sgs.v3/~media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf>

This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at <http://www.sgs.com/au/Terms-and-Conditions/General-Conditions-of-Services-English.aspx>. The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

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## ANALYTICAL REPORT

## NATA

WORLD RECOGNISED  
ACCREDITATION

### CLIENT DETAILS

Contact **Craig Ridley**  
Client **Compaction and Soil Testing Services Pty Ltd**  
Address **Unit 1 / 7B Owen St  
GLENDENNING NSW 2761**

Telephone **02 9675 7522**  
Facsimile **02 9675 7544**  
Email **craig@comsoiltest.com.au**

Project **Dunheved**  
Order Number **(Not specified)**  
Samples **32**

### LABORATORY DETAILS

Manager **Huong Crawford**  
Laboratory **SGS Alexandria Environmental**  
Address **Unit 16, 33 Maddox St  
Alexandria NSW 2015**

Telephone **+61 2 8594 0400**  
Facsimile **+61 2 8594 0499**  
Email **au.environmental.sydney@sgs.com**

SGS Reference **SE122986 R0**  
Report Number **0000071704**  
Date Reported **12 Dec 2013**  
Date Received **04 Dec 2013**

### COMMENTS

Accredited for compliance with ISO/IEC 17025. NATA accredited laboratory 2562(4354).

TRH - The Limit of Reporting (LOR) has been raised due to interferences from the sample matrix.

No respirable fibres detected in all samples using trace analysis technique.  
Asbestos analysed by Approved Identifier Ravee Sivasubramaniam.

### SIGNATURES

Andy Sutton  
Senior Organic Chemist

Huong Crawford  
Production Manager

Ly Kim Ha  
Organic Section Head

Ravee Sivasubramaniam  
Asbestos Analyst



# ANALYTICAL REPORT

SE122986 R0

to SGS  
Fibre Identification in soil

Method AN602

Laboratory Reference	Client Reference	Matrix	Sample Description	Date Sampled	Fibre Identification	Est. Level
SE122986.001	TP 101	Soil	104g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01
SE122986.002	TP 102	Soil	08g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01
SE122986.003	TP 103	Soil	165g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01
SE122986.004	TP 104	Soil	117g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01
SE122986.005	TP 105	Soil	154g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01
SE122986.006	TP 106	Soil	95g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01
SE122986.007	TP 107	Soil	171g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01
SE122986.008	TP 108	Soil	156g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01
SE122986.009	TP 109	Soil	104g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01
SE122986.010	TP 110	Soil	150g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01
SE122986.011	TP 111	Soil	138g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01
SE122986.012	TP 112	Soil	105g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01
SE122986.013	TP 113	Soil	148g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01
SE122986.014	TP 114	Soil	121g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01
SE122986.015	TP 115	Soil	177g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01
SE122986.016	TP 116	Soil	90g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01
SE122986.017	TP 117	Soil	190g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01
SE122986.018	TP 118	Soil	172g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01
SE122986.019	TP 119	Soil	220g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01
SE122986.020	TP 120	Soil	150g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01
SE122986.021	TP 121	Soil	166g Soil,clay,rocks	04 Dec 2013	No Asbestos Found	<0.01
SE122986.022	TP 122	Soil	182g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01
SE122986.023	TP 123	Soil	158g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01
SE122986.024	TP 124	Soil	132g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01
SE122986.025	TP 125	Soil	198g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01



# ANALYTICAL REPORT

SE122986 R0

RESULTS

Fibre Identification in soil

Method AN002

Laboratory Reference	Client Reference	Matrix	Sample Description	Date Sampled	Fibre Identification	Est. conc
SE122986.026	TP 126	Soil	214g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01
SE122986.027	TP 127	Soil	175g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01
SE122986.028	TP 128	Soil	166g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01
SE122986.029	TP 129	Soil	130g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01
SE122986.030	TP 130	Soil	229g Soil,clay,rocks	04 Dec 2013	No Asbestos Found Organic Fibres Detected	<0.01



# METHOD SUMMARY

SE122986 R0

EP 0400

METHODOLOGY SUMMARY

- AN602 Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic 'clues', which provide a reasonable degree of certainty, dispersion staining is a mandatory 'clue' for positive identification. If sufficient 'clues' are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
- AN602 Fibres/material that cannot be unequivocally identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf).
- AN602 AS4964 2004 Method for the Qualitative Identification of Asbestos in Bulk Samples, Section 8.4, Trace Analysis Criteria, Note 4 states: "Depending upon sample condition and fibre type, the detection limit of this technique has been found to lie generally in the range of 1 in 1,000 to 1 in 10,000 parts by weight, equivalent to 1 to 0.1 g/kg."

## COLOURS

Amosite	-	Brown Asbestos	NA	-	Not Analysed
Chrysotile	-	White Asbestos	LNR	-	Listed, Not Required
Crocidolite	-	Blue Asbestos	"	-	Not Accredited
Amphiboles	-	Amosite and/or Crocidolite	"	-	Indicative data, theoretical holding time exceeded.

This report does not comply with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment and Remediation and Management of Asbestos Contaminated sites in Western Australia - May 2009.

Sampled by the client.

Where reported: 'Asbestos Detected': Asbestos detected by polarized light microscopy, including dispersion staining.

Where reported: 'No Asbestos Found': No Asbestos Found by polarized light microscopy, including dispersion staining.

Where reported: 'UMF Detected': Mineral fibres of unknown type detected by polarized light microscopy, including dispersion staining. Confirmation by another independent analytical technique may be necessary.

Even after disintegration it can be very difficult, or impossible, to detect the presence of asbestos in some asbestos-containing bulk materials using polarised light microscopy. This is due to the low grade or small length or diameter of asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials.

The QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: <http://www.sgs.com.au/pv.sgs3/-/media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf>

This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at <http://www.sgs.com/au/Terms-and-Conditions/General-Conditions-of-Services-English.aspx>. The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

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This test report shall not be reproduced, except in full.



## **Compaction & Soil Testing Services Pty Limited**

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### **Appendix D**

#### **Curriculum Vitae**

# **Craig Ridley - Curriculum Vitae**

## **Tertiary Education**

**University of Western Sydney, Hawkesbury**  
*Bachelor of Applied Science (Environmental Health), 02/2007 – 04/2013*

- Major: Environmental Health Management

## **Professional Experience**

**Compaction & Soil Testing Services Pty Ltd**  
*Environmental Consultant, 02/2011 - Present*

### **Roles;**

- Waste Classification Assessments
- Preliminary and Detailed Site Investigations
- Site Validation Assessments
- Acid Sulphate Soil Assessments
- Salinity Investigations

### **Major Projects;**

- Great Western Highway Upgrade, Woodford to Hazelbrook NSW
- Tempo Apartments Development, Mascot NSW
- Centre for Obesity, Diabetes and Cardiovascular Disease, University of Sydney, Camperdown NSW
- Bunning's Warehouse, Wallsend NSW
- Habitat Apartments, Braddon ACT
- Wollongong Private Hospital NSW
- ERKO Apartments, Erskineville NSW
- Greenway, Marsden Park NSW

# Ashleigh Brice - Curriculum Vitae

## Tertiary Education

### **Macquarie University**

*Bachelor of Environment, 02/2010 – 11/2012*

- Major: Biology
- Minor: Environmental Management

## Professional Experience

### **Compaction & Soil Testing Services Pty Ltd**

*Environmental Consultant, 03/2013 - Present*

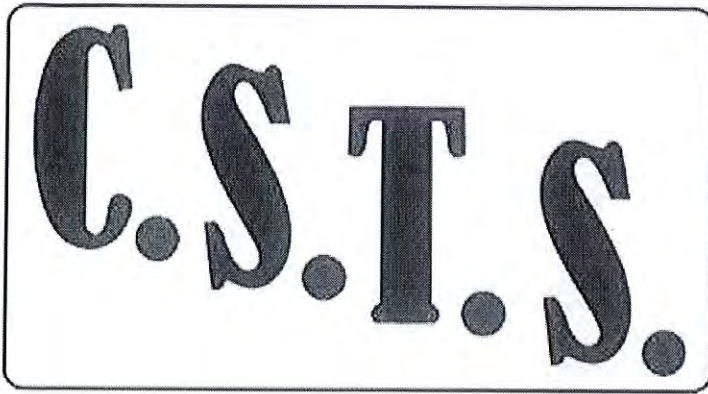
#### Roles;

- Waste Classification Assessments
- Preliminary and Detailed Site Investigations
- Site Validation Assessments
- Acid Sulphate Soil Assessments
- Salinity Investigations

#### Major Projects;

- Bunning's Warehouse, Wallsend NSW
- ERKO Apartments, Erskineville NSW
- Putney Hill Development, Ryde NSW





**REPORT**

**TO**

**MARK MULOCK & CO**

**ON**

**RECYCLED CRUSHED CONCRETE ASSESSMENT**

**FOR**

**SUITABILITY OF SITE FOR COMMERCIAL/INDUSTRIAL USE**

**AT**

**65-73A DUNHEVED CIRCUIT, ST MARYS NSW**

17 Jan 2014

**Job No: MAG 1930**

**Report No: ENV AB**

**Our Ref No: 433**

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Job No: MAG 1930  
Report No: ENV AB  
Our Ref: 433

Mark Mulock & Co  
Suite 1, Level 1  
Nepean Walkway Arcade  
374 High Street  
Penrith NSW 2750

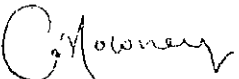

Attention: Mr Mark Mulock

**Recycled Crushed Concrete Assessment Report  
65-73A Dunheved Circuit, St Marys NSW**

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All enquiries regarding this project are to be directed to the undersigned

Document Status		
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Revision Number	Status	Date
0	Final	17 January 2014



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### Executive Summary

Compaction & Soil Testing Services Pty Ltd (CSTS) was engaged by Mark Mulock & Co to conduct an assessment of the recycled crushed concrete product which has been placed upon the site known as 65-73A Dunheved Circuit, St Marys NSW. The objective of the assessment was to determine whether the material was suitable for Commercial / Industrial land use. CSTS also assessed two areas of stained material to determine whether fluid spills had rendered impacted material unsuitable for Commercial / Industrial land use. This report should be read in conjunction with CSTS report 427 – MAG1930 ENV AA which details the previous TRH and BTEX assessment of two (2) stained areas (presumed to be from fuel spills) and asbestos investigation conducted upon the recycled crushed concrete.

In order to achieve the objective, the following scope of work was undertaken;

- Review of the report detailing the previous investigation (TRH and BTEX on two (2) areas of stained material and asbestos assessment), conducted upon the material under assessment (CSTS report 427 – MAG1930 ENV AA),
- Walkover of the site to determine the material composition and other properties determinable through visual inspection,
- Excavation of thirty (30) test pits,
- Recovery of fifteen (15) samples from the surface of the recycled crushed concrete and fifteen (15) samples from the interface of the recycled crushed concrete and underlying material,
- Recovery of two (2) surface samples from stained areas,
- Transportation of recovered samples to a NATA accredited laboratory for analysis,
- Review of analysis results in comparison to Health-Based Investigation Levels (HILs) for Commercial / Industrial land use as detailed within the *National Environment Protection (Assessment of Site Contamination) Measure 1999 (Amended 2013)*,
- Correlation of data and preparation of this report.

The material previously covered an area of approximately 2Ha, however, at the time of the investigation, material along the western side of the property had been scraped and stockpiled. The material consists of crushed concrete, brick, tile and PVC plastic pipes. Limited evidence of foam, rubber and fabric was observed within the material. No fragments of material suspected of containing Asbestos were observed during the investigation or the previous investigation. The layer varied in thickness, though was on average approximately 50-100mm thick.

In order to adequately assess the contamination status of the material, samples were recovered and submitted for analysis to a NATA Accredited laboratory. Field and laboratory quality assurance and quality control measures were implemented to ensure the reliability of the results.

The previous investigation (detailed in CSTS report 427 – MAG1930 ENV AA) detected no Asbestos fibres within any of the samples recovered during the investigation. TRH F3 and TRH F4 were detected within the samples of the stained material, the concentrations of which were below the HILs for Commercial / Industrial

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land use. No concentrations of BTEX, Naphthalene, TRH F1 or TRH F2 were detected within any samples.

The laboratory analysis of this investigation detected concentrations of Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Zinc, PAH, B(a)P TEQ, TRH (F2), TRH (F3), TRH (F4), Toluene, Naphthalene and PCBs. Spikes in concentrations of TRH (F3) and TRH (F4) were detected within the stained material. All detected concentrations of tested analytes were within the HILs for Commercial/Industrial sites.

No concentrations of TRH (F1), Benzene, Ethyl-benzene, Xylene, OCP or OPP were detected within any samples.

Therefore, CSTS concluded the recycled crushed concrete product placed upon the site known as 65-73A Dunheved Circuit, St Marys NSW is of a suitable condition for ongoing Commercial / Industrial land use, from a contamination perspective, in accordance with the *National Environment Protection (Assessment of Site Contamination) Measure 1999 (Amended 2013)*.

Should you have any queries about the methodology, findings or recommendations of this investigation, please do not hesitate to contact our office on (02) 9675 7522.

# Compaction & Soil Testing Services Pty Limited

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## Appendices

Appendix A	Site Location
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# Compaction & Soil Testing Services Pty Limited

## Abbreviations

ACM	Asbestos Containing Material
AF	Asbestos Fines
BTEX	Benzene, Toluene, Ethyl-benzene, Xylene
CSTS	Compaction & Soil Testing Services Pty Ltd
COAG	Council of Australian Government
DOH	Department of Health
FA	Friable Asbestos
Ha	Hectare
HIL	Health-Based Investigation Levels
IEC	International Electrotechnical Commission
ISO	International Organisation for Standardisation
mg/kg	Milligrams per Kilogram
mm	Millimetre
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council (Now COAG SCEW)
NEPM 1999	National Environment Protection (Assessment of Site Contamination) Measure 1999 (Amended 2013)
NSW	New South Wales
PTFE	Polytetrafluoroethylene (Teflon)
PVC	Polyvinyl Chloride
QA	Quality Assurance
QC	Quality Control
SCEW	Standing Council on Environment and Water
TP	Test Pit
TRH	Total Recoverable Petroleum Hydrocarbons
TRH (F1)	C <sub>6</sub> -C <sub>10</sub> Carbon Fraction TRH minus BTEX
TRH (F2)	>C <sub>10</sub> -C <sub>16</sub> Carbon Fraction TRH minus Naphthalene
TRH (F3)	>C <sub>16</sub> -C <sub>34</sub> Carbon Fraction TRH
TRH (F4)	>C <sub>34</sub> -C <sub>40</sub> Carbon Fraction TRH
USEPA	United States Environment Protection Authority
WA	Western Australia



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## 1 Introduction

### 1.1 Background

Compaction & Soil Testing Services Pty Ltd (CSTS) was engaged by Mark Mulock & Co to conduct an assessment of the recycled crushed concrete product which had been placed upon the site known as 65-73A Dunheved Circuit, St Marys NSW.

CSTS is of the understanding that a civil dispute has arisen regarding the site, and that this report may be used for evidence. We, Celia Moloney and Craig Ridley, have read the Part 31 of Division 2 of the Uniform Civil Rules 2005 and Schedule 7 of the Uniform Civil Procedure Rules 2005. We understand our obligations to the Court and agree to abide by the rules in Part 31 in Schedule 7. We, Celia Moloney and Craig Ridley hereby attach our current CVs in Appendix D with the qualifications and experience as set out therein.

### 1.2 Objectives

The objective of this assessment was to determine whether the recycled crushed concrete product placed upon the surface was suitable for use on Commercial / Industrial properties. CSTS also assessed two areas of stained material to determine whether suspected fluid spills had rendered the impacted material unsuitable for Commercial / Industrial use.

## 2 Scope of Works

In order to achieve the objectives of this assessment, the following scope of works was undertaken;

- Review of the report detailing the previous investigation (TRH and BTEX on two (2) areas of stained material and asbestos assessment), conducted upon the material under assessment (CSTS report 427 – MAG1930 ENV AA),
- Walkover of the site to determine the material composition and other properties determinable through visual inspection,
- Excavation of thirty (30) test pits,
- Recovery of fifteen (15) samples from the surface of the recycled crushed concrete and fifteen (15) samples from the interface of the recycled crushed concrete and underlying material,
- Recovery of two (2) surface samples from stained areas,
- Transportation of recovered samples to a NATA accredited laboratory for analysis,
- Review of analysis results in comparison to HILs for Commercial / Industrial land use as detailed within the *National Environment Protection (Assessment of Site Contamination) Measure 1999 (Amended 2013)*,
- Correlation of data and preparation of this report.

## 3 Site Identification

### 3.1 Site Description

The site under assessment is known as 65-73A Dunheved Circuit, St Marys NSW. The site is bordered by Dunheved Circuit to the east, vacant industrial land to the south, Links Road to the west and a large industrial factory and associated space to

# Compaction & Soil Testing Services Pty Limited

the north. The site is 'battle-axed' and an engineering workshop and the Rembrandt Dutch Club occupy the northeast of the site. Refer to Appendix A.

The area under assessment is within the driveway and open area upon which a recycled crushed concrete product has been placed. The assessment area is considered to cover an area of approximately 2 Ha, to a depth of between 50-100mm. This area is inclusive of the area of assessment which has been scraped and stockpiled (refer to Section 3.2 Material Description). The area CSTS was engaged to assess is detailed within Appendix A.

## 3.2 Material Description

The material under assessment is the surface covering of the site. Specifically, the assessed material is identified as the imported recycled crushed concrete product used to form an aggregate hardstand. The material appeared to consist of crushed concrete, brick, tile and PVC plastic pipes. Limited evidence of foam, rubber and fabric was observed within the material. No fragments of material suspected of containing Asbestos were observed during this or the previous investigation. Laboratory testing of the material from the previous investigation did not detect any asbestos within the sampled material. The layer of recycled crushed concrete varied in thickness, though was on average approximately 50-100mm thick. Refer to Photographs within Appendix B.

Within the previous investigation two (2) areas of stained material were tested for BTEX and TRH. At the time of this investigation (06 January 2014), the recycled crushed concrete which had been placed along the western side of the property, had been scraped and stockpiled. Refer to Appendix A. One of the stains observed in the previous investigation was located within this scraped area, however, a more recent stain was observed at another location (refer to Appendix A for location). Therefore, ST1 from the previous investigation was re-sampled and an additional sample from the more recent stain was also taken (ST2).

## 4 Sampling Process

### 4.1 Sampling Pattern

Samples were collected at two approximate depths a) near the surface of the recycled crushed concrete and b) at the interface of the crushed concrete and the underlying material. This alternated between sampling locations. Samples collected near the surface and samples collected at the interface of the recycled crushed concrete and the underlying material was denoted by the suffix -1 and -2 respectively in their sample IDs.

The sampling pattern closely mimicked the sampling pattern adopted during the investigation conducted on the 04 December 2013. Most samples were collected as close as possible to the sampling locations of the previous investigation. As stated previously, at the time of the investigation, the recycled crushed concrete placed along the western side of the property had been cleared and stockpiled. In this area, 50% of the samples were taken from the stockpile of recycled crushed concrete to represent the surface material, and 50% of the samples were taken from the sampling locations of the previous investigations (to represent the interface of the recycled crushed concrete and the underlying material). Two additional samples were collected from material where staining was observed.

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In the previous investigation, and by extension a majority of this investigation, a stratified sampling pattern was adopted in accordance with the *NSW EPA Sampling Design Guidelines 1995*. Based on the size of the site, a 26m grid pattern was adopted, with the sampling locations located within the centre of each grid location.

Where the centre of the grid was inappropriate for sampling, such as when obstructions were present or the point was not within the recycled crushed concrete product, the sample point was moved within the grid to an available, suitable location. This was the case for a number of test pits, as detailed in Table A. Refer to Appendix A.

**Table A: Alterations to the Stratified Sampling Pattern**

Test Pit	Reason for Relocation	Altered Sampling Location <sup>1</sup>
TP101	Asphalt	3m South
TP102	Asphalt	4m South
TP111	Spatial extent of assessed material	3m South; 2m East
TP119	Obstruction	4m South
TP121	Obstruction	2m West
TP122	Obstruction	2m East
TP124	Obstruction	4m South
TP128	Obstruction	5m North; 3m West
TP129	Obstruction	3m East

1. As measured from the planned sampling point at the centre of the grid square

## 4.2 Sampling Technique

Sampling was undertaken in accordance with AS 4482.1 – 2005 – Guide to the investigation and sampling of sites with potentially contaminated soil – Part 1: Non-volatile and semi-volatile compounds, AS 4482.2 – 1999 – Guide to the sampling and investigation of potentially contaminated soil – Part 2: Volatile substances and current industry guidelines.

At each sampling location, a test pit was excavated using a back-hoe supplied and operated by Antqip Pty Ltd to the depth of the recycled crushed concrete, that is, approximately 50-100mm. A sample was recovered using disposable latex gloves, sometimes with the aid of a trowel, to transfer a portion of the material into a laboratory supplied 250mL glass jar with a Teflon seal lid. The sample was sealed and labelled with a job number and sample ID before being transferred to a chilled container. Once the sample had been recovered, the test pit was re-filled with the excavated material in accordance with Work Health and Safety requirements.

At each stain, a decontaminated stainless steel trowel was used to transfer a portion of the surface material into a laboratory supplied 250mL glass jar with Teflon seal lid. The sample was sealed and labelled with a job number and sample ID before being transferred into a chilled container to begin the cool down process as required prior to chemical analysis of the soil.

When all the samples had been recovered, the chilled container was sealed and transported to SGS Australia Pty Ltd under stringent chain of custody procedures. SGS Australia Pty Ltd is a laboratory accredited by NATA (Accreditation Number

# Compaction & Soil Testing Services Pty Limited

2562) and was chosen to undertake the chemical analysis due to their past experience with this form of analysis. Upon receipt of the samples, a technician from SGS Australia Pty Ltd checked the samples to confirm their condition, including the integrity of the sample jar seals. When satisfied the samples were received in an appropriate condition as required under current Australian Standards, SGS Australia Pty Ltd returned a Sample Receipt. Laboratory Documentation is located within Appendix C.

## 5 Field Quality Assurance and Quality Control

### 5.1 Sampling Team

Sampling was conducted by Ms Celia Moloney and Ms Ashleigh Brice, Environmental Consultants from Compaction & Soil Testing Services Pty Ltd on 06 January 2014. Therefore, the samples were deemed to be recovered by suitably qualified and experienced samplers.

### 5.2 Decontamination Process

To minimise the potential for cross-contamination to occur during the sampling process, a new set of disposable latex gloves was used to recover each sample. When a trowel was used, it was decontaminated prior to recovery of a sample. The decontamination process is as follows;

- Remove soils adhering to the object by scrubbing with a clean, soft bristled brush,
- Thoroughly wash the equipment in a solution of 3% phosphate-free detergent (Decon 90),
- Thoroughly rinse the equipment in either distilled water or portable water, depending on availability,
- Dry the equipment with a clean cloth or terry towel.

### 5.3 Sample Preservation

To ensure the reliability of the results obtained, the samples were analysed in accordance with the appropriate holding periods detailed within the *NEPM 1999 (Amended 2013)* published by the NEPC. The samples were preserved in accordance with *NEPM 1999 (Amended 2013)* as detailed in Table B.

**Table B: Recommended Holding Times & Sample Preservations**

Analyte	Holding Time	Container	Preservation
Heavy Metals (excluding Hg)	6 months	Glass	Chilled
Mercury	28 days	Plastic / Glass*	Chilled
PCB	28 days	Glass with PTFE lined lid	Chilled, stored away from light
PAH	14 days	Glass with PTFE lined lid	Chilled, no headspace
TRH	14 days	Glass with PTFE lined lid	Chilled, no headspace
BTEX	14 days	Glass with PTFE lined lid	Chilled, no headspace
Naphthalene	14 days	Glass with PTFE-lined lid	Chilled, no Headspace
OCP/OPP	14 days	Glass with PTFE lined lid	Chilled, no headspace

Adapted from *National Environment Protection (Assessment of Site Contamination) Measure 1999 (Amended 2013)*

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## 5.4 Detailed Site Records

Detailed site records were created during the site assessment. These records consisted of written records and photographs including details of locations, material condition and samples. The samples were transferred to the laboratory in accordance with stringent chain of custody procedures with appropriate documentation (Appendix C).

## 5.5 Field Quality Control Samples

No field QA/QC samples were recovered or analysed, as this was beyond the scope of works. Field QA/QC relied upon the measures outlined within Sections 5.1-5.4.

## 5.6 Field QA/QC Evaluation

Due to the compliance with and extent of field Quality Assurance and Quality Control measures, CSTS considers the field procedure was adequate and the results obtained reliable and useable for the expressed purpose.

## 6 Laboratory Quality Assurance and Quality Control

SGS Australia Pty Ltd is registered by NATA for Chemical Testing and Quality System compliance to ISO/IEC 17025 (Accreditation Number 2562). For this reason they were deemed as suitably qualified to conduct the assessment of these soil samples.

### 6.1 Quality Control Samples

As a NATA accredited laboratory, SGS Australia Pty Ltd must conform to a variety of quality assurance procedures. Quality control samples included in any analytical run are listed below.

#### 6.1.1 Reagent/Analysis Blank & Method Blank

Sample free reagents carried through the preparation/extraction/digestion procedure and analysed at the beginning of every sample batch analysis. A reagent blank is prepared and analysed with every batch of samples plus with each new batch of solvent prior to use.

#### 6.1.2 Sample Matrix Spike & Matrix Spike Duplicate

Sample replicates spiked with identical concentrations of target analyte(s). The spiking occurs during the sample preparation and prior to the extraction/digestion procedure. They are used to document the precision and bias of a method in a given sample matrix. Where there is not enough sample available to prepare a spiked sample, another known soil/sand or water may be used. A duplicate spiked sample is analysed at least every 20 samples.

#### 6.1.3 Surrogate Spike

Used to determine the extraction efficiency, surrogate spikes are organic compounds which are similar to the target analyte(s) in chemical composition and behaviour in the analytical process, but which are not normally found in environmental samples. Where possible they are surrogate compounds recommended by the USEPA. At least one, but up to three, surrogate compounds are added to all samples requiring analysis for organics prior to extraction.

#### 6.1.4 Control Matrix Spike

To ensure spike recoveries can be determined for every batch of samples a control matrix is spiked with identical concentrations of target analyte(s) and then analysed.

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These results allow recoveries to be determined in the event that the matrix spikes are unusable (eg. Matrix spikes performed on heavily contaminated samples). These are analysed at least every 20 samples.

## **6.1.5 Internal Standard**

Added to all samples requiring analysis for organics (where relevant) after the extraction process; the compounds serve to give a standard of retention time and response, which is invariant from run-to-run with the instruments. Where possible they are standard compounds recommended by the USEPA.

## **6.1.6 Lab Duplicates**

A separate portion of a sample being analysed that is treated the same as the other samples in the batch. One duplicate is processed at least every 10 samples.

## **6.1.7 Lab Control Samples**

Prepared from a source independent of the calibration standards, at least one control standard is included in each run to confirm calibration validity. Thereafter they are analysed at least every one in 20 samples plus at the end of each analytical run.

## **6.1.8 Continuous Calibration Verification**

A calibration check standard or continuous calibration standard and blank are run after every 20 samples of an instrumental analysis run to assess analytical drift. Calibration standards are checked old versus new with criteria of  $\pm 20\%$ .

## **6.2 Quality Assurance Programs**

### **6.2.1 Statistical Analysis of Quality Control Data**

Quality control data is plotted on control charts using the APHA procedure with warning and control limits at 2 and 3 standard deviations respectively.

### **6.2.2 Certified Reference Materials**

Certified Reference Materials and Standards are analysed for method validation. These materials/standards have certified reference values for various parameters and may also be used for method troubleshooting.

### **6.2.3 Proficiency Testing**

Regular proficiency test samples are analysed by our laboratories. SGS Australia Pty Ltd participates in a number of programs. Results and proficiency status are compiled and sent to participating laboratory post data interpretation. Failure to comply with acceptable values may result in further investigation.

### **6.2.4 Inter-laboratory & Intra-laboratory Testing**

SGS Australia Pty Ltd has schedules in the Quality Systems to participate in Inter/Intra laboratory testing conducted internally and by other parties.

## **6.3 Laboratory QA/QC Evaluation**

CSTS has checked the QA/QC procedures adopted by the laboratory against the appropriate guidelines. The quality control sample numbers adopted by SGS Australia Pty Ltd are considered to be adequate for the analyses undertaken and conform to the recommendations provided in *NEPM 1999 (Amended 2013)*.

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Overall, the quality control elements indicate that the analytical data fall within acceptable levels of accuracy and precision for the analysis of soils and water. The analytical data provided is therefore considered reliable and useable for this assessment.

## 7 Assessment Criteria

The purpose of the assessment was to determine whether the recycled crushed concrete was fit for Commercial / Industrial use. The material was therefore assessed for a range of potential contaminants and was also compared to the HILs for Commercial/Industrial land-use (Table C).

The material was assessed for the presence and concentration of;

- Heavy Metals (Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Zinc)
- Total PAH and B(a)P TEQ,
- TRH,
- BTEX,
- Total OCP,
- Total OPP, and
- Total PCB.

**Table C: Assessment Criteria (mg/kg)**

Analyte	Commercial/Industrial Health Investigation Levels <sup>1</sup> (mg/kg)	
Arsenic	3,000	
Cadmium	900	
Chromium	3,600	
Copper	240,000	
Lead	1,500	
Mercury	180	
Nickel	6,000	
Zinc	400,000	
PAH	4,000	
B(a)P TEQ <sup>2</sup>	40	
Benzene	3 <sup>2</sup>	430 <sup>d</sup>
Toluene	NL <sup>2</sup>	99,000 <sup>3</sup>
Ethyl-benzene	NL <sup>2</sup>	27,000 <sup>3</sup>
Xylene	NL <sup>2</sup>	81,000 <sup>3</sup>
Naphthalene	NL <sup>2</sup>	11,000 <sup>3</sup>
TRH F1	250 <sup>2</sup>	26,000 <sup>3</sup>
TRH F2	NL <sup>2</sup>	20,000 <sup>4</sup>
TRH F3	27,000	
TRH F4	38,000	
DDT + DDE + DDD	3,600	
Aldrin + Dieldrin	45	
Chlordane	530	
Endosulfan	2,000	
Endrin	100	
Heptachlor	50	
HCB	80	
Methoxychlor	2,500	
Chlorpyrifos	2,000	
PCB	7	

Adapted from NEPM 1999 (As amended)

1. Adapted from NEPM 1999 (amended 2013)
2. Most Stringent Investigation Level for HILs D Vapour Intrusion (wether sand, silt or clay 0m to <1m),
3. Investigation Level for Direct Contact adopted from Friebel & Nadebaum (2011).

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## 8 Results of Laboratory Analysis

The laboratory analysis was undertaken by experienced technicians from SGS Australia Pty Ltd in accordance with relevant Australian Standards, government guidelines and the conditions of their NATA accreditation.

### 8.1 Heavy Metals

Within the recovered samples, concentrations of Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel and Zinc were detected above the PQL (Table D).

Within all samples the levels of heavy metals were all within the HILs for Commercial/Industrial sites, with no great spike in any one sample. Therefore, the presence of the tested heavy metals is not considered to affect the material's suitability for its current land use.

### 8.2 Volatile Compounds & Hydrocarbons

Almost 50% of samples detected concentrations of PAH, while a minority of samples detected TRH (F2), TRH F(3), TRH F(4), Toluene and Naphthalene. A noticeable spike in concentrations of TRH (F3) and TRH (F4) was detected within the stained material. However, all detected concentrations of the tested volatile compounds and hydrocarbons were within the HILs for Commercial/Industrial sites and are therefore not considered to affect the material's suitability for its current land use.

No concentrations of TRH (F1), Benzene, Ethyl-benzene or Xylene were detected above the PQL within the recovered samples (Table D). Therefore, the site is considered as not impacted by the presence of TRH (F1), Benzene, Ethyl-benzene and Xylene.

### 8.3 Organic Compounds

Within all of the recovered samples, only one (1) sample detected a concentration of PCBs. The concentration was well below the HILs for Commercial/Industrial sites, and is therefore not considered to affect the material's suitability for its current land use.

No concentrations of OCP or OPP were detected above the PQL (Table D). As such, the site is considered as not affected by the presence of OCP or OPP.

Table D: Laboratory Analysis

Sample	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAH	B(a)P TEQ	TRH (F1)	TRH (F2)	TRH (F3)	TRH (F4)	Benzene	Toluene	Ethyl-benzene	Xylenes	Naphthalene	DDT+DDE+	Aldrin + Dieldrin	Chlordane	Endosulfan	Endrin	Heptachlor	HCB	Methoxychlor	Chlorpyrifos	Total PCB		
TP201-2	<PQL	<PQL	12	110	22	0.01	21	76	4.6	0.5	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL		
TP202-1	<PQL	<PQL	40	27	18	0.02	34	81	19	1.8	<PQL	<PQL	260	130	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	
TP203-2	<PQL	<PQL	16	25	15	0.01	18	60	0.9	<PQL	<PQL	<PQL	110	<PQL	<PQL	0.2	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	
TP204-1	3	<PQL	14	34	40	0.03	23	90	5.7	0.5	<PQL	<PQL	130	<PQL	<PQL	0.1	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	
TP205-2	5	<PQL	17	42	48	0.03	39	98	2.8	0.4	<PQL	<PQL	190	210	<PQL	0.1	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	
TP206-1	3	<PQL	9.2	25	7	<PQL	6.6	42	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.2	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	
TP207-2	4	<PQL	14	36	25	0.04	10	86	1.3	<PQL	<PQL	<PQL	92	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	
TP208-1	3	<PQL	10	61	20	0.03	7.1	61	3.4	0.4	<PQL	<PQL	110	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	
TP208-2	5	<PQL	16	23	25	0.05	11	65	1.4	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	
TP210-1	5	<PQL	14	21	28	0.03	9.1	70	1.0	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	
TP211-2	7	<PQL	15	26	25	0.06	11	73	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	
TP212-1	5	<PQL	13	25	24	0.03	7.4	55	1.5	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	
TP213-2	6	<PQL	14	22	21	0.03	11	110	2.8	0.4	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	
TP214-1	5	<PQL	16	26	28	0.03	12	76	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	
TP215-2	6	<PQL	12	22	23	0.03	9.4	66	2.3	0.3	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	
TP216-1	4	<PQL	13	35	27	<PQL	6.7	92	1.4	<PQL	<PQL	<PQL	99	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	
TP217-2	4	<PQL	11	24	23	2.3	7.1	64	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	
TP218-1	<PQL	<PQL	10	49	9	2.0	11	51	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	
TP219-2	5	0.3	21	37	42	3.3	33	100	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	
TP220-1	3	<PQL	12	59	27	1.5	19	100	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	
TP221-2	5	<PQL	11	100	15	0.02	12	67	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
TP222-1	3	<PQL	12	140	9	0.02	15	55	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
TP223-2	4	<PQL	13	140	13	0.01	12	49	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
TP224-1	4	0.3	18	130	19	0.03	41	91	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
TP225-2	5	<PQL	14	120	14	0.02	13	76	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
TP226-1	3	<PQL	15	39	19	0.01	19	82	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
TP227-2	3	<PQL	13	150	12	0.02	16	77	<PQL	<PQL	<PQL	300	1400	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
TP228-1	6	0.3	22	110	26	0.02	9.8	45	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
TP229-2	<PQL	<PQL	12	71	14	0.01	12	78	<PQL	<0.2	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
TP230-1	<PQL	<PQL	15	49	16	0.03	17	65	<PQL	<0.2	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
ST1	<PQL	<PQL	11	22	19	0.01	13	150	<1.6	<0.4	<PQL	<PQL	15000	4000	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
ST2	<PQL	<PQL	11	40	19	<PQL	15	100	<4.0	<1.0	<PQL	410	26000	16000	<PQL	<PQL	<PQL	<PQL	0.1	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
HIL D	3000	900	3600	240000	1500	180	6000	400000	4000	40	250	NL	27000	38000	3	NL	NL	NL	NL	3600	45	530	2000	100	50	80	2500	2000	7		
											26000 <sup>2</sup>	20000 <sup>2</sup>			430 <sup>2</sup>	990000 <sup>2</sup>	27000 <sup>2</sup>	810000 <sup>2</sup>	110000 <sup>2</sup>												

Adapted from SGS Australia Pty Ltd, Analytical Report SE123728 (Appendix C) Notes: NT – Not tested, Bolded & Shaded = exceeds the assessment criterion, NL = No Limit

1. Most Stringent Investigation Level for HLLs D Vapour Intrusion (weather sand, silt or clay 0m to <1m).

2. Investigation Level for Direct Contact.

# Compaction & Soil Testing Services Pty Limited

## 9 Conclusions & Recommendations

Based on the conducted assessment, CSTS drew the following conclusions:

- The material under assessment previously covered an area of approximately 2 Ha within the site known as 65-73A Dunheved Circuit, St Marys NSW. At the time of this investigation, some of this material along the western side of the property had been stockpiled.
- Stained material in one area observed in the previous investigation could no longer be located as the material had been pushed into a stockpile. The other area of stained material and a new stain not previously identified was observed and sampled during the investigation.
- The material under investigation consists of imported recycled crushed concrete product consisting of concrete, brick, tile and PVC plastic pipes. Limited evidence of foam, rubber and fabric was observed,
- The material was approximately 50-100mm thick on average,
- No material suspected of containing Asbestos was observed during this or the previous investigation,
- No Asbestos fines were detected within any of the samples within the previous investigation conducted. TRH (F3) and TRH (F4) were detected within the samples of the stained material recovered in the previous investigation, the concentrations of which were below the HILs for Commercial / Industrial land use,
- The laboratory analysis of this investigation detected concentrations of Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Zinc, PAH, B(a)P TEQ, TRH (F2), TRH (F3), TRH (F4), Toluene, Naphthalene and PCBs.
- Spikes in concentrations of TRH (F3) and TRH (F4) were detected within the stained material.
- All detected concentrations of tested analytes were within the HILs for Commercial/Industrial sites.
- No concentrations of TRH (F1), Benzene, Ethyl-benzene, Xylene, OCP or OPP were detected within any samples.

Therefore, CSTS concluded the recycled crushed concrete product placed upon the site known as 65-73A Dunheved Circuit, St Marys NSW is of a suitable condition for ongoing Commercial / Industrial land use, from a contamination perspective, in accordance with the *National Environment Protection (Assessment of Site Contamination) Measure 1999 (Amended 2013)* and the *WA DOH Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia; May 2009*.

Should you have any queries about the methodology, findings or recommendations of this investigation, please do not hesitate to contact our office on (02) 9675 7522.

# **Compaction & Soil Testing Services Pty Limited**

## **10 Limitations**

This classification covers **ONLY** the crushed recycled concrete product placed upon the surface of the property known as 65-73A Dunheved Circuit, St Marys NSW. No other material is covered under this classification.

This report covers the site at the time of sampling. Should there be any variations in site conditions since the above mentioned date such as importation of fill, chemical spillage, illegal dumping, the detection of suspected ACM etc, further assessment will be required. Should any suspect materials be encountered, we recommend that this office be contacted immediately for further assessment. Neither Compaction & Soil Testing Services Pty Ltd nor any other reputable firm can give unqualified warranties on the conditions of the site and subsurface conditions.

While Compaction & Soil Testing Services Pty Ltd takes all reasonable due care and diligence, we offer no absolute warranty for the material between the locations sampled and investigated. In addition, Compaction & Soil Testing Services Pty Ltd does not assume any liability for site conditions unobserved or inaccessible at the time of the investigation.

This report has been prepared for the particular project described and no responsibility is accepted for the use of any part of this report in any other context or for any other purpose. If there is any change in the proposed development described in the report then all recommendations should be reviewed. No other warranty expressed or implied is made or intended. Copyright on this report remains the property of Compaction & Soil Testing Services Pty Ltd.

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If you have any queries about this investigation please do not hesitate to contact our office on (02) 9675 7522.

# Compaction & Soil Testing Services Pty Limited

## 11 References

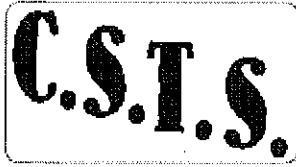
National Environment Protection Council, 2013, *National Environment Protection (Assessment of Site Contamination) Measure 1999*

New South Wales Environment Protection Authority, 1995, *Sampling Design Guidelines 1995*

SGS Australia Pty Ltd, 16 January 2014, *Analytical Report SE123728*, prepared for Compaction & Soil Testing Services Pty Ltd

Standards Australia, 2005, AS 4482.1 – 2005 – *Guide to the investigation and sampling of sites with potentially contaminated soil – Part 1: Non-volatile and semi-volatile compounds*

Standards Australia, 1999, AS 4482.2 – 1999 – *Guide to the sampling and investigation of potentially contaminated soil – Part 2: Volatile substances and current industry guidelines*



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## **Appendix A**

### **Site Location**



Sourced: [www.nearmap.com](http://www.nearmap.com) under licence to Compaction & Soil Testing Services Pty Ltd 2014, imagery date, 02 September 2013

**Compaction and Soil Testing Services Pty Ltd**



**Notes:** This drawing has been produced using a base plan provided by others to which additional information e.g. density test, DCP and Test Pit locations or notes have been added. Some or all the information shown on the plan may not be relevant at the time of producing this drawing.

Drawn:	CM
Approved:	CR
Date:	14/01/2014
Scale:	NTS

Site Location	65-73A Dunheved Circuit St Marys NSW
---------------	---

Job No.	MAG 1930
Drawing No:	ENV AB001

Issued No.1.1

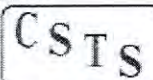
Issued By:PC



Showing 2 Sep 2013  
 20 m  
 100 ft

Sourced: [www.nearmap.com](http://www.nearmap.com) under licence to Compaction & Soil Testing Services Pty Ltd 2014, imagery date, 02 September 2013

**Compaction and Soil Testing Services Pty Ltd**



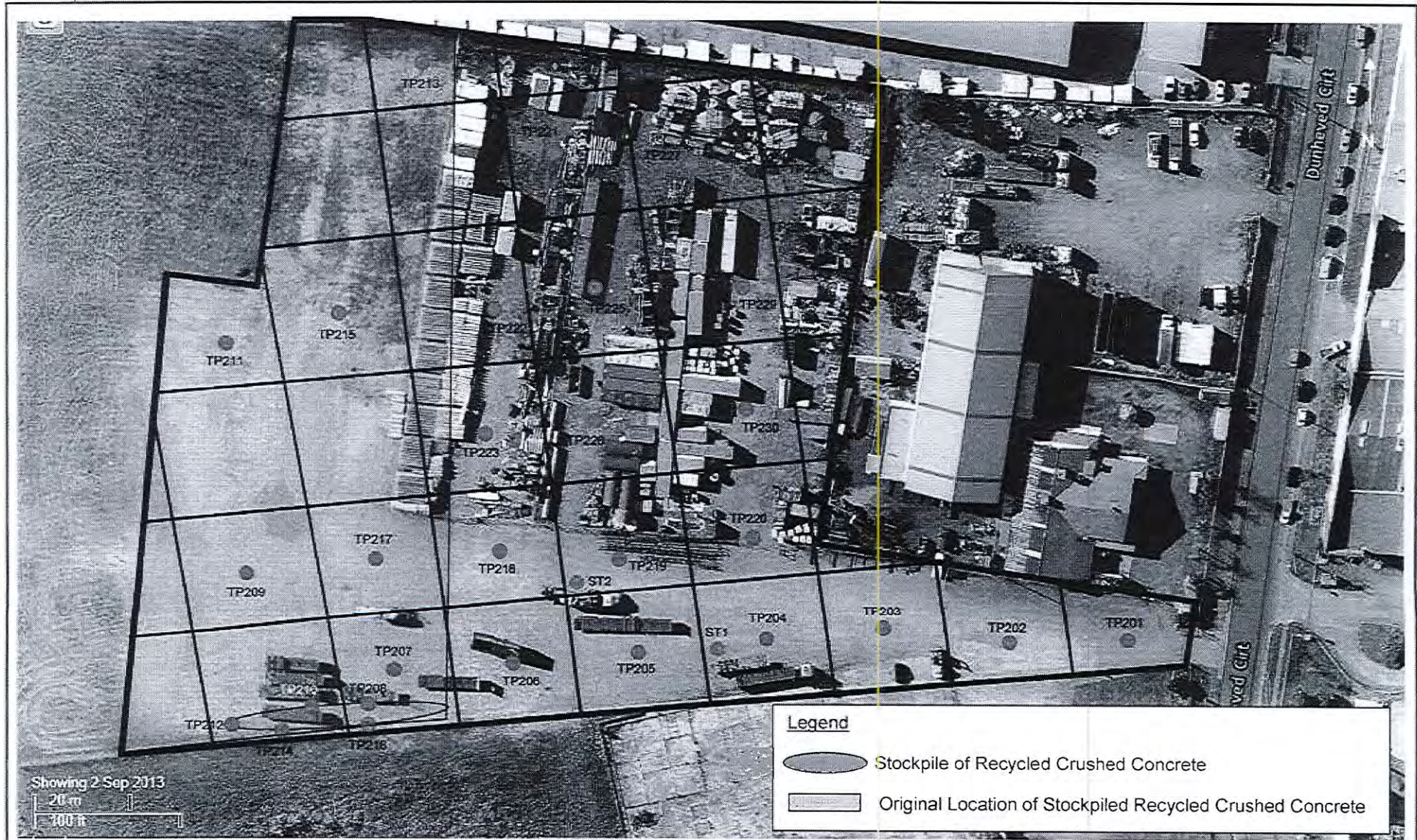
**Notes:** This drawing has been produced using a base plan provided by others to which additional information e.g.: density test, DCP and Test Pit locations or notes have been added. Some or all the information shown on the plan may not be relevant at the time of producing this drawing.

Drawn:	CM
Approved:	CR
Date:	14/01/2014
Scale:	As Shown

**Assessment Area**  
 65-73A Dunheved Circuit  
 St Marys NSW

Job No: MAG 1930

Drawing No: ENV AB002



Sourced: [www.nearmap.com](http://www.nearmap.com) under licence to Compaction & Soil Testing Services Pty Ltd 2014, imagery date, 02 September 2013

**Compaction and Soil Testing Services Pty Ltd**



**Notes:** This drawing has been produced using a base plan provided by others to which additional information e.g.: density test, DCP and Test Pit locations or notes have been added. Some or all the information shown on the plan may not be relevant at the time of producing this drawing.

Drawn:	CM
Approved:	CR
Date:	14/01/2014
Scale:	As Shown

**Sampling Locations**  
65-73A Dunheved Circuit  
St Marys NSW

Job No:	MAG 1930
Drawing No:	ENV AB003



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## **Appendix B**

### **Site Photographs**




A: Site Condition – taken within south western portion of the site, looking east

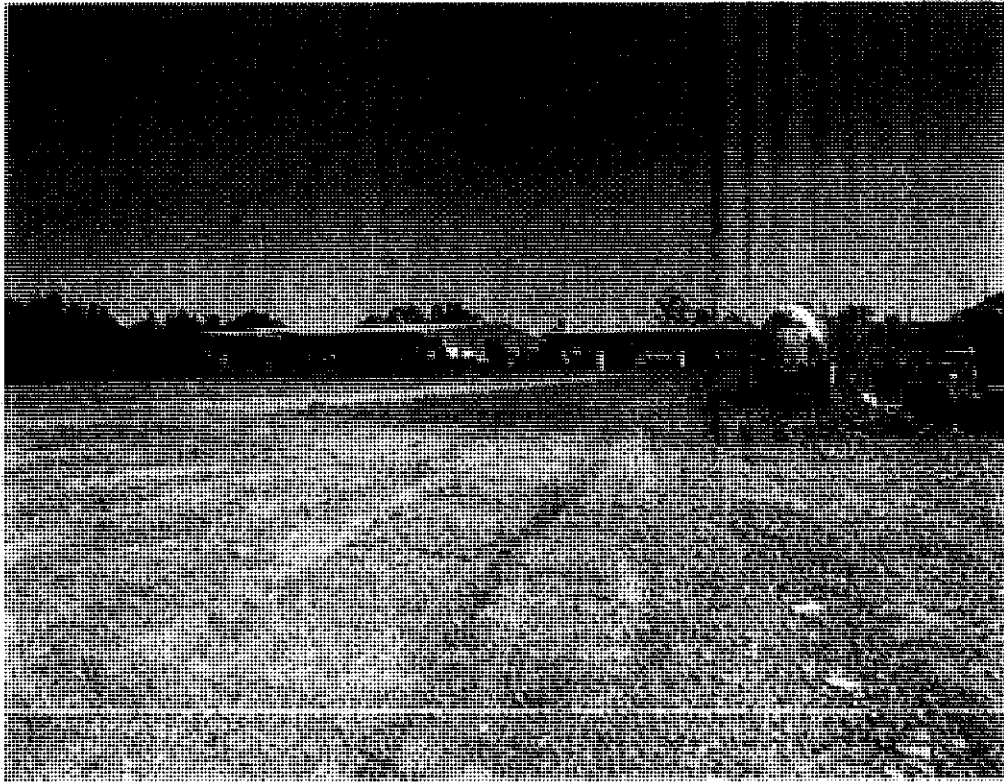


B: Recycled Crushed Concrete & Interface of Recycled Crushed Concrete and Underlying Material.

Photographs Taken by CSTS Environmental Consultant 05/01/2014

**Compaction and Soil Testing Services Pty Ltd**

	<b>Notes:</b> This drawing has been produced using a base plan provided by others to which additional information e.g.: density test, DCP and Test Pit locations or notes have been added. Some or all the information shown on the plan may not be relevant at the time of producing this drawing.	Drawn:	CM	<b>Site Photographs</b> 65-73A Dunheved Circuit St Marys NSW	Drawing No:	ENV AB004
		Approved:	GR		Job No:	MAG 1930
		Date:	14/01/2014			
		Scale:	Not to scale			



C: Landscape Photo of Area Cleared of Recycled Crushed Concrete



D: Stockpile of Recycled Crushed Concrete from Cleared Area

Photographs Taken by CSTS Environmental Consultant 08/01/2014

**Compaction and Soil Testing Services Pty Ltd**

	<i>Notes: This drawing has been produced using a base plan provided by others to which additional information e.g. density test, DCP and Test Pit locations or notes have been added. Some or all the information shown on the plan may not be relevant at the time of producing this drawing.</i>	Drawn:	AB	<b>Site Photographs</b> 65-73A Dunheved Circuit St Marys NSW	Drawing No:	ENV AB005
		Approved:	CR		Job No	MAG 1930
		Date:	14/01/2014			
		Scale:	Not to scale			



E: Material Condition – Close Up



F: Material Condition – Close Up

Photographs Taken by CSTS Environmental Consultant 06/01/2014

**Compaction and Soil Testing Services Pty Ltd**

	<i>Notes: This drawing has been produced using a base plan provided by others to which additional information e.g.: density test, DCP and Test Pit locations or notes have been added. Some or all the information shown on the plan may not be relevant at the time of producing this drawing.</i>	Drawn	CM	<b>Site Photographs</b> 65-73A Dunheved Circuit St Marys NSW	Drawing No.	FNW AB006
		Approved	CR		Job No: <b>MAG 1930</b>	
		Date:	14/01/2014			
		Scale:	Not to scale			



# **Compaction & Soil Testing Services Pty Limited**

1/78 Owen Street, GLENDENNING NSW 2761 • ABN 44 106 976 738

Phone: (02) 9675 7522 Fax: (02) 9675 7544

Email: [office@comsoiltest.com.au](mailto:office@comsoiltest.com.au) Web: [www.comsoiltest.com.au](http://www.comsoiltest.com.au)

## **Appendix C**

### **Laboratory Documentation**



## SAMPLE RECEIPT ADVICE

SE123728

### CLIENT DETAILS

**Client:** Celia McInney  
**Client:** Compaction and Soil Testing Services Pty Ltd  
**Address:** Unit 1 / 78 Owen St  
GLENDENNING NSW 2781

### LABORATORY DETAILS

**Manager:** Huong Crawford  
**Laboratory:** SGS Alexandria Environmental  
**Address:** Unit 16, 33 Maddox St  
Alexandria NSW 2015

**Telephone:** 02 9675 7522  
**Facsimile:** 02 9675 7544  
**Email:** celia@comsoiltest.com.au

**Telephone:** +61 2 8594 0400  
**Facsimile:** +61 2 8594 0499  
**Email:** au.environmental.sydney@sgs.com

**Project:** **MAG1930 - ENVI-27CSRE-v3**  
**Order Number:** (Not specified)  
**Samples:** 32

**Samples Received:** Mon 6/1/2014  
**Report Due:** Tue 14/1/2014  
**SGS Reference:** **SE123728**

### ASSUMPTIONS MADE

This is to confirm that 32 samples were received on Monday 6/1/2014. Results are expected to be ready by Tuesday 14/1/2014. Please quote SGS reference SE123728 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Sample counts by matrix	32 Soils	Type of documentation received	COC
Date documentation received	6/1/2014	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	4°C
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes	Number of eskies/boxes received	

Samples will be held for one month for water samples and two months for soil samples from date of report, unless otherwise instructed.

### REMARKS

Samples received at SGS on 6/1/2014@5.10pm. Samples were not registered until the next working day.

To the extent not inconsistent with the other provisions of this document and unless specifically agreed otherwise in writing by SGS, all SGS services are rendered in accordance with the applicable SGS General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions/General-Conditions-of-Services-English.aspx> as at the date of this document. Attention is drawn to the limitations of liability and to the clauses of indemnification.

Environmental Services Unit 16 33 Maddox St Alexandria NSW 2015 Australia t +61 2 8594 0400 f +61 2 8594 0499 www.au.sgs.com  
PO Box 6432 Bourke Rd BC Alexandria NSW 2015 Australia

Member of the SGS Group



# SAMPLE RECEIPT ADVICE

SE123728

Client: Competition and Soil Testing Services Pty Ltd

Project: MAG1530 - ENVI-270SRE-v3

Order Reference: 10000000000000000000

No	Sample ID	OC Pesticides in Soil	OP Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	PCBs in Soil	Total Recoverable Metals in Soil by ICPEES from:	TPH (Total Recoverable Hydrocarbons) in Soil	VOCs in Soil	Volatil Petrolium Hydrocarbons in Soil
001	TP201-2	25	13	23	11	7	9	12	8
002	TP202-1	25	13	23	11	7	9	12	8
003	TP203-2	28	13	23	11	7	9	12	8
004	TP204-1	28	13	23	11	7	9	12	8
005	TP205-2	28	13	23	11	7	9	12	8
006	TP206-1	28	13	23	11	7	9	12	8
007	TP207-2	28	13	23	11	7	9	12	8
008	TP208-1	28	13	23	11	7	9	12	8
009	TP209-2	28	13	23	11	7	9	12	8
010	TP210-1	28	13	23	11	7	9	12	8
011	TP211-2	28	13	23	11	7	9	12	8
012	TP212-1	28	13	23	11	7	9	12	8
013	TP213-2	28	13	23	11	7	9	12	8
014	TP214-1	28	13	23	11	7	9	12	8
015	TP215-2	28	13	23	11	7	9	12	8
016	TP216-1	28	13	23	11	7	9	12	8
017	TP217-2	28	13	23	11	7	9	12	8
018	TP218-1	28	13	23	11	7	9	12	8
019	TP219-2	28	13	23	11	7	9	12	8
020	TP220-1	28	13	23	11	7	9	12	8
021	TP221-2	28	13	23	11	7	9	12	8
022	TP222-1	28	13	23	11	7	9	12	8
023	TP223-2	28	13	23	11	7	9	12	8
024	TP224-1	28	13	23	11	7	9	12	8

This shows table represents SGS Environmental Services' interpretation of the client supplied Chain of Custody document. The numbers shown in the table indicate the number of results requested in each package. Please indicate as soon as possible should your request differ from these details. Testing as per this table shall commence immediately unless the client intervenes with a correction.



# SAMPLE RECEIPT ADVICE

SE123728

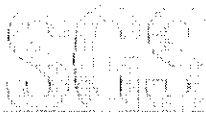
Company: Compaction and Soil Testing Services Pty Ltd

Project: MAG1930 - ENVI-27CSRE-v3

Client: [REDACTED]

No	Sample ID	OC Pesticides in Soil	OP Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in	PCBs in Soil	Total Recoverable Metals in Soil by ICPOES from	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
025	TP225-2	28	13	23	11	7	9	12	8
026	TP226-1	28	13	23	11	7	9	12	8
027	TP227-2	28	13	23	11	7	9	12	8
028	TP228-1	28	13	23	11	7	9	12	8
029	TP229-2	28	13	23	11	7	9	12	8
030	TP230-1	28	13	23	11	7	9	12	8
031	ST1	28	13	23	11	7	9	12	8
032	ST2	28	13	23	11	7	9	12	8

The above table represents SGS Environmental Services' interpretation of the client-supplied Chain Of Custody document. The numbers shown in the table indicate the number of results requested in each package. Please indicate as soon as possible should your request differ from these details. Testing as per this table shall commence immediately unless the client intervenes with a correction.



# SAMPLE RECEIPT ADVICE

SE123728

Company: Compaction and Soil Testing Services Pty Ltd

Project: MAG1030 - ENVI-27CSRE-v3

Client: [REDACTED]

No.	Sample ID	Mercury in Soil	Moisture Content
001	TP201-2	1	1
002	TP202-1	1	1
003	TP203-2	1	1
004	TP204-1	1	1
005	TP205-2	1	1
006	TP206-1	1	1
007	TP207-2	1	1
008	TP208-1	1	1
009	TP209-2	1	1
010	TP210-1	1	1
011	TP211-2	1	1
012	TP212-1	1	1
013	TP213-2	1	1
014	TP214-1	1	1
015	TP215-2	1	1
016	TP216-1	1	1
017	TP217-2	1	1
018	TP218-1	1	1
019	TP219-2	1	1
020	TP220-1	1	1
021	TP221-2	1	1
022	TP222-1	1	1
023	TP223-2	1	1
024	TP224-1	1	1

The above table represents SGS Environmental Services' interpretation of the client-supplied Chain Of Custody document. The numbers shown in the table indicate the number of results requested in each package. Please indicate as soon as possible should your request differ from these details. Testing as per this table shall commence immediately unless the client intervenes with a correction.



## SAMPLE RECEIPT ADVICE

SE123728

Company Name: Compaction and Soil Testing Services Pty Ltd

Form No: MAG1930 - ENVI-2/CSRC-v3

Client Name: [REDACTED]

No	Sample ID	Mercury in Soil	Moisture Content
025	TP225-2	1	1
026	TP226-1	1	1
027	TP227-2	1	1
028	TP228-1	1	1
029	TP228-2	1	1
030	TP230-1	1	1
031	ST1	1	1
032	ST2	1	1

The above table represents HSH Environmental Services' interpretation of the client-supplied Chain Of Custody documents.  
The numbers shown in the table indicate the number of results requested in each package.  
Please indicate as soon as possible should your request differ from these details.  
Testing as per this table shall commence immediately unless the client intervenes with a correction.



# CHAIN OF CUSTODY & ANALYSIS REQUEST

**SGS Environmental Services**  
 Unit 16, 33 Maddox Street  
 Alexandria NSW 2015  
 Telephone No: (02) 85940400  
 Facsimile No: (02) 85940499  
 Email: au.samplerreceipt.sydney@sgs.com

Company Name: Construction & Soil Testing Services  
 Address: 178 Dixon Street Alexandria  
 Contact Name: John Murray & Ashleigh Rose

Project Name/No: MIAGA 2  
 Purchase Order No:  
 Results Required By: STA  
 Telephone: 0420 813 534  
 Facsimile:  
 Email Results: cc: au.samplerreceipt@sgs.com.au, ashleigh.rose

Client Sample ID	Date Sampled	Lab Sample ID	WATER	SOIL	PRESERVATIVE	NO OF CONTAINERS	TPH	BTEX	PAH	OC/OP/PCB	TOTAL PHENOLICS	METALS	Whole Core L	Received	
														By	Date/Time
TP201-2	5/1/2014	1		X								X		Received	5/1/14
TP203-1		2		X								X		By	5/1/14
TP203-2		3		X								X		Time	5:10 am
TP204-1		4		X								X		Samples Intact	Yes
TP205-2		5		X								X		Temperature on Receipt	15°C
TP206-1		6		X								X		Storage Location	SGS 123778
TP207-2		7		X								X		SGS REF No	SGS123778
TP208-1		8		X								X			
TP209-2		9		X								X			

Relinquished By: SGS Date/Time: 5:10 2/1/2014 Received By: [Signature] Date/Time: 5:10 2/1/14

Relinquished By: SGS Date/Time: 5:10 2/1/2014 Received By: [Signature] Date/Time: 5:10 2/1/14

Samples Intact: Yes/No Temperature: Ambient / Chilled Sample Cooler Sealed: Yes/No Laboratory Quotation No: SGS123778

Comments: Waste Classification 2 - Heavy Metals, BTEX, PAH, TPH, OC, OP, PCB, PCBs

# CHAIN OF CUSTODY & ANALYSIS REQUEST

**SGS Environmental Services**  
**Unit 16, 33 Maddox Street**  
**Alexandria NSW 2015**  
**Telephone No: (02) 85940400**  
**Facsimile No: (02) 85940499**  
**Email: au.samplerreceipt.sydney@sgs.com**

Company Name: _____	Project Name/No: _____
Address: _____	Purchase Order No: _____
_____	Results Required By: _____
Contact Name: _____	Telephone: _____
_____	Facsimile: _____
_____	Email Results: _____

Client Sample ID	Date Sampled	Lab Sample ID	WATER	SOIL	PRESERVATIVE	NO OF CONTAINERS	TPH	BTEX	PAH	OC / OP / PCB	TOTAL PHENOLICS	METALS	6 USE CLASS /						
10	6/11/2014	10		X									X						
11		11		X									X						
12		12		X									X						
13		13		X									X						
14		14		X									X						
15		15		X									X						
16		16		X									X						
17		17		X									X						
18		18		X									X						

Relinquished By: _____	Date/Time: 3:10 6/11/2014	Received By: _____	Date/Time: _____
Relinquished By: _____	Date/Time: _____	Received By: _____	Date/Time: _____
Samples Intact: Yes/No	Temperature: Ambient / Chilled	Sample Cooler Sealed: Yes/No	Laboratory Quotation No: SER 2320
Comments: _____			



# CHAIN OF CUSTODY & ANALYSIS REQUEST

**SGS Environmental Services**  
 Unit 16, 33 Maddox Street  
 Alexandria NSW 2015  
 Telephone No: (02) 85940400  
 Facsimile No: (02) 85940499  
 Email: au.samplereceipt.sydney@sgs.com

Company Name: \_\_\_\_\_ Project Name/No: \_\_\_\_\_  
 Address: \_\_\_\_\_ Purchase Order No: \_\_\_\_\_  
 \_\_\_\_\_ Results Required By: \_\_\_\_\_  
 Contact Name: \_\_\_\_\_ Telephone: \_\_\_\_\_  
 \_\_\_\_\_ Facsimile: \_\_\_\_\_  
 \_\_\_\_\_ Email Results: \_\_\_\_\_

Client Sample ID	Date Sampled	Lab Sample ID	WATER	SOIL	PRESERVATIVE	NO OF CONTAINERS	TPH	BTEX	PAH	OC / OP / PCB	TOTAL PHENOLICS	METALS									
TP229-2	6/1/2014	19		X																	
TP228-1		20		X																	
TP229-1		21		X																	
TP222-1		22		X																	
TP223-2		23		X																	
TP224-1		24		X																	
TP225-2		25		X																	
TP226-1		26		X																	
TP227-2		27		X																	

Relinquished By: \_\_\_\_\_ Date/Time: 5:10 6/1/2014 Received By: [Signature] Date/Time: \_\_\_\_\_  
 Relinquished By: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Received By: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Samples Intact:  Yes /  No Temperature: Ambient / Chilled Sample Cooler Sealed:  Yes /  No Laboratory Quotation No: 5 E123728  
 Comments: \_\_\_\_\_



## AU.SampleReceipt.Sydney (Sydney)

---

**From:** Celia Moloney [Celia@comsoiltest.com.au]  
**Sent:** Tuesday, 7 January 2014 9:57 AM  
**To:** AU.SampleReceipt.Sydney (Sydney)  
**Subject:** COC  
**Attachments:** 2013-06-01 COC Compaction and Soil Testing Services.pdf

Hello,

As I only put the Quote number on page 4 of the COC I dropped off yesterday, I just want to clarify that the Laboratory Quotation Number for this COC (attached) is ENVI-27CSRE-v3

(Thanks for your help)

**Celia Moloney**  
**Environmental Consultant**  
Compaction & Soil Testing Services Pty Ltd  
1/78 Owen Street, Glendenning, NSW  
Ph: (02) 9675 7522  
Fax: (02) 9675 7544  
Email: [celia@comsoiltest.com.au](mailto:celia@comsoiltest.com.au)



AUSTRALIA – ENVIRONMENTAL SERVICES SYDNEY – PROFORMA FORM  
SAMPLE INFORMATION

Approved: D. Liang

JOB No. SE: 23728

Sample No.	P 100ml UP	P 250ml UP	P 500ml UP	P 1L UP	G 100 Amber UP	G 200 Amber UP	G 500 Amber UP	G 1L Amber UP	G 40ml vial Up	G 40ml Vial HCl	P 100ml HCl	G 40ml Vial H2SO4	P 100ml H2SO4	P 250ml H2SO4	G 500ml Amber H2SO4	G 1L H2SO4	P 100/250ml HN03 Total	P 100ml HN03 Filtered	P 250ml NaOH	P 250ml Zn Acetate	Plastic Bag	G 250ml Soil Jar	Sample Matrix	Lab Bottles Supplied By	Comments		
32																								Soil	SGS	PLI	



# ANALYTICAL REPORT

# NATA

WORLD RECOGNISED  
ACCREDITATION

## CLIENT INFORMATION

**Name:** Celia McInney  
**Company:** Compaction and Soil Testing Services Pty Ltd  
**Address:** Unit 1 / 78 Owen St  
GLENDENNING NSW 2761

**Telephone:** 02 9675 7522  
**Facsimile:** 02 9675 7544  
**Email:** celia@comsoiltest.com.au

**Project:** MAG1930 - ENVI-27CSRE-v3  
**Order Number:** (Not specified)  
**Samples:** 32

## LABORATORY INFORMATION

**Manager:** Huong Crawford  
**Laboratory:** SGS Alexandria Environmental  
**Address:** Unit 16, 33 Maddox St  
Alexandria NSW 2015

**Telephone:** +61 2 8594 0400  
**Facsimile:** +61 2 8594 0499  
**Email:** au.environmental.sydney@sgs.com

**Client Reference:** SE123728 R0  
**Report Number:** 0000073440  
**Date Reported:** 16 Jan 2014  
**Date Received:** 08 Jan 2014

## REMARKS

Accredited for compliance with ISO/IEC 17025. NATA accredited laboratory 2562(4354).

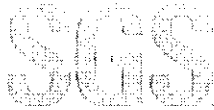
PAH - The Limit of Reporting (LOR) has been raised due to interferences from the sample matrix.  
TRH - Sample # 32 results based on dilution of sample

## APPROVALS

Andy Sutton  
Senior Organic Chemist

Dong Liang  
Metals/Inorganics Team Leader

Ly Kim Ha  
Organic Section Head



# ANALYTICAL REPORT

SE123728 R0



VOC's in Soil - Method: AN433/AN434

Matrix: Air and Soil

Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	0.2	0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1

Polycyclic Aromatic Hydrocarbons

Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	0.2
-------------	-------	-----	------	------	------	-----

Chlorinated

Dibromofluoromethane (Surrogate)	%	-	81	84	88	87
d4-1,2-dichloroethane (Surrogate)	%	-	70	82	91	82
d8-toluene (Surrogate)	%	-	87	89	103	104
Bromofluorobenzene (Surrogate)	%	-	103	99	109	101

Other

Total Xylenes*	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX*	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6

Volatile Petroleum Hydrocarbons in Soil - Method: AN433/AN434

TRH C6-C10	mg/kg	25	<25	<25	<25	<25
TRH C8-C10	mg/kg	20	<20	<20	<20	<20

Surrogate

Dibromofluoromethane (Surrogate)	%	-	81	84	88	87
d4-1,2-dichloroethane (Surrogate)	%	-	78	82	91	82
d8-toluene (Surrogate)	%	-	87	89	103	104
Bromofluorobenzene (Surrogate)	%	-	103	99	109	101



ANALYTICAL REPORT

SE123728 R0



Volatile Petroleum Hydrocarbons in Soil Method: AN430/AN404/AN410 (continued)

Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25

TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403

TRH C10-C14	mg/kg	20	<20	<20	<20	<20
TRH C15-C20	mg/kg	45	<45	130	40	39
TRH C20-C30	mg/kg	45	<45	220	100	110
TRH C17-C40	mg/kg	100	<100	<100	<100	<100
TRH C10-C30 Total	mg/kg	110	<110	350	150	170
TRH C10-C40 Total	mg/kg	210	<210	350	<210	<210

TRH >

TRH >C10-C16 (F2)	mg/kg	25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	110	<110	260	110	130
TRH >C34-C40 (F4)	mg/kg	120	<120	130	<120	<120

PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420

Naphthalene	mg/kg	0.3	<0.1	0.1	<0.1	1.3
2-methylnaphthalene	mg/kg	0.3	<0.1	0.1	<0.1	0.2
1-methylnaphthalene	mg/kg	0.3	<0.1	0.2	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	0.7	<0.1	0.1
Acenaphthene	mg/kg	0.3	<0.1	0.1	<0.1	<0.1
Fluorene	mg/kg	0.3	<0.1	0.4	<0.1	<0.1
Fluoranthene	mg/kg	0.3	0.5	2.8	<0.1	0.4
Anthracene	mg/kg	0.3	0.3	0.7	<0.1	0.1
Fluoranthene	mg/kg	0.3	0.8	3.3	0.2	0.6
Pyrene	mg/kg	0.1	0.8	2.6	0.2	0.7
Benzo(a)anthracene	mg/kg	0.1	0.5	1.5	0.1	0.5
Chrysene	mg/kg	0.1	0.4	1.6	0.1	0.3
Benzo(b&j)fluoranthene	mg/kg	0.1	0.5	1.7	0.2	0.5
Benzo(k)fluoranthene	mg/kg	0.1	0.2	0.7	<0.1	0.2
Benzo(a)pyrene	mg/kg	0.1	0.4	1.3	0.1	0.3
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	0.3	0.7	<0.1	0.2
Dibenzo(a,b)anthracene	mg/kg	0.1	<0.1	0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	0.2	0.3	<0.1	0.2
Total PAH	mg/kg	0.8	4.6	19	0.8	5.7
Carcinogenic PAHs (as BaP TEQ)*	TEQ	0.2	0.5	1.8	<0.2	0.5



# ANALYTICAL REPORT

SE123728 R0



PAH (Polycyclic Aromatic Hydrocarbons) in Soil Method: AN420 (continued)

Surrogate:

d5-nitrobenzene (Surrogate)	%	98	98	100	100
2-fluorobiphenyl (Surrogate)	%	94	96	94	94
d14-p-terphenyl (Surrogate)	%	90	90	88	90

OC Pesticides in Soil Method: AN400, AN410

Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	5.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
trans Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Delta	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endat Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
toxar	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1



# ANALYTICAL REPORT

SE123728 R0



OC Pesticides in Soil Method: AN400/AN420 (continued)

Tetrachloro-m-xylene (TCMX) (Surrogate)	%		123	110	123	124
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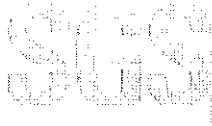
OP Pesticides in Soil Method: AN400/AN420

Dechlorane	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
Disulfoton	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Bromopropyl Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
EFMO	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2

2-fluorobiphenyl (Surrogate)	%		94	90	94	94
d14-p-terphenyl (Surrogate)	%		90	90	96	90

PCBS in Soil Method: AN400/AN420

Aroclor 1248	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Aroclor 1221	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Aroclor 1254	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Aroclor 1242	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Aroclor 1260	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Aroclor 1254	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Aroclor 1260	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Aroclor 1248	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Aroclors)	mg/kg	1	<1	<1	<1	<1



# ANALYTICAL REPORT

SE123728 R0



## PCBs in Soil - Method: AN499/AN420 (continued)

Tetrachloro-m-xylene (TCMX) (Surrogate)	%	123	140	123	124
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## Total Recoverable Metals in Soil by ICPEES from EPA 200.8 Digest - Method: AN040/AN320

Arsenic, As	mg/kg	3	<3	<3	<3	3
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.3	12	40	16	14
Copper, Cu	mg/kg	0.5	110	27	25	34
Lead, Pb	mg/kg	1	22	16	16	40
Nickel, Ni	mg/kg	0.5	21	34	16	23
Zinc, Zn	mg/kg	0.5	76	81	60	60

## Chlorine in Soil - Method: AN312

Mercury	mg/kg	0.01	0.01	0.02	0.01	0.03
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## Moisture Content - Method: AN002

% Moisture	%	0.1	1.0	2.0	3.0	1.1
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ANALYTICAL REPORT

SE123728 R0



VOCs in Soil - Method: AN133/AN134

Location: [blurred]

Benzene	mg/kg	5.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	0.1	0.2	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
m,p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1

Polycyclic Aromatics

Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
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Surrogates

Dibromofluoromethane (Surrogate)	%	-	95	86	91	86
d4-1,2-dichloroethane (Surrogate)	%	-	90	81	85	79
d8-toluene (Surrogate)	%	-	94	97	100	89
Bromofluorobenzene (Surrogate)	%	-	96	101	105	92

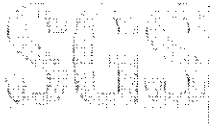
Total Xylenes*	mg/kg	0.1	<0.3	<0.3	<0.3	<0.3
Total BTEX*	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6

Volatile Petroleum Hydrocarbons in Soil - Method: AN133/AN134/AN135

TRH (C6-C10)	mg/kg	25	<25	<25	<25	<25
TRH (C6-C9)	mg/kg	20	<20	<20	<20	<20

Surrogates

Dibromofluoromethane (Surrogate)	%	-	95	86	91	86
d4-1,2-dichloroethane (Surrogate)	%	-	90	81	85	79
d8-toluene (Surrogate)	%	-	94	97	100	89
Bromofluorobenzene (Surrogate)	%	-	96	101	105	92



# ANALYTICAL REPORT

SE123728 R0



**Volatile Petroleum Hydrocarbons in Soil - Method: AN432/AN434/AN410 (continued)**

1/11/2011

Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25

**TRH (Total Recoverable Hydrocarbons) in Soil - Method: AN403**

TRH C10-C14	mg/kg	20	<20	<20	<20	<20
TRH C15-C19	mg/kg	45	74	<45	48	53
TRH C20-C24	mg/kg	45	220	<45	81	90
TRH C25-C30	mg/kg	100	110	<100	<100	<100
TRH C31-C35 Total	mg/kg	110	290	<110	<110	140
TRH C36-C40 Total	mg/kg	210	400	<210	<210	<210

1/11/2011

TRH >C10-C16 (F2)	mg/kg	25	<25	<25	<25	<25
TRH >C16-C24 (F3)	mg/kg	90	190	<90	92	110
TRH >C24-C40 (F4)	mg/kg	120	210	<120	<120	<120

**PAH (Polycyclic Aromatic Hydrocarbons) in Soil - Method: AN120**

Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Manthrene	mg/kg	0.1	0.2	<0.1	0.3	0.3
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	0.5	<0.1	0.3	0.7
Pyrene	mg/kg	0.1	0.5	<0.1	0.3	0.8
Benzo(a)anthracene	mg/kg	0.1	0.3	<0.1	0.2	0.4
Chrysene	mg/kg	0.1	0.3	<0.1	0.1	0.3
Benzo(b)fluoranthene	mg/kg	0.1	0.4	<0.1	0.2	0.4
Benzo(k)fluoranthene	mg/kg	0.1	0.2	<0.1	<0.1	0.2
Benzo(a)pyrene	mg/kg	0.1	0.3	<0.1	0.1	0.3
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	0.2	<0.1	<0.1	0.2
Dibenz(a,h)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	0.1	<0.1	<0.1	0.1
Total PAH	mg/kg	0.8	2.8	<0.8	1.3	3.4
Carcinogenic PAHs (as BaP TEQ)*	TEQ	0.2	0.4	<0.2	<0.2	0.4



# ANALYTICAL REPORT

SE123728 R0



PAH (Polynuclear Aromatic Hydrocarbons) in Soil - Method: 81420 (Continued)

Unit:

Compound Name (Sample)	%	95	98	99	99
2-Methylanthracene (Sample)	%	92	90	92	92
3-Methylanthracene (Sample)	%	94	90	90	92

OC (Organic Chlorides) in Soil - Method: AN400AN20

Compound Name	Unit	0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorocyclopentadiene (HCCP)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha HCH	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Gamma HCH	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Delta HCH	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
o,p' DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Gamma Dieldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha Dieldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
p,p' DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Delta HCH	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Gamma HCH	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
o,p' DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
p,p' DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Polychlorinated Biphenyls	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Beta HCH	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Yield (Sample)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endo HCH	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Isomers	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Misc	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1



ANALYTICAL REPORT

SE123728 R0



OC Pesticides in Soil Method: AN400/AN420 (continued)

Tetrachloro-m-xylene (TCMX) (Surrogate)	%		116	114	113	117
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OC Pesticides in Soil Method: AN400/AN420

Dinoseb	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
Dinosebrot	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Metolachlor	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2

2-fluorobiphenyl (Surrogate)	%		82	80	83	82
d14-p-terphenyl (Surrogate)	%		84	80	86	82

PCBs in Soil Method: AN400/AN420

Aroclor 1254	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Aroclor 1271	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Aroclor 1232	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Aroclor 1242	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Aroclor 1248	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Aroclor 1254	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Aroclor 1260	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Aroclor 1262	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Aroclor 1268	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Aroclors)	mg/kg	1	<1	<1	<1	<1



# ANALYTICAL REPORT

SE123728 R0



PCBs in Soil Method: AN400/AN400 (continued)

Tetrachloro-m-xylene (TCMX) (Surrogate)	%		118	114	113	117
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Total 8 Heavy Metals in Soil by IC-PODC from EPA 806 B Digest Method: AN840/AN320

Arsenic, As	mg/kg	3	5	3	4	3
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.3	17	9.2	14	10
Copper, Cu	mg/kg	0.5	42	25	36	61
Lead, Pb	mg/kg	1	48	7	25	20
Nickel, Ni	mg/kg	0.5	39	6.6	10	7.1
Zinc, Zn	mg/kg	0.5	98	42	86	61

Mercury in Soil Method: AN012

Mercury	mg/kg	0.01	0.03	<0.01	0.04	0.03
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Moisture Content Method: AN092

% Moisture	%	6.8	4.1	2.0	2.8	5.9
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ANALYTICAL REPORT

SE123728 R0

VOC's in Soil Method: AN423/M424

0.000000000000000000000000

Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1

PAH's in Soil

Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
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PCP's

Dibromofluoromethane (Surrogate)	%	-	86	85	83	111
d4-1,2-dichloroethane (Surrogate)	%	-	81	79	83	111
d8-toluene (Surrogate)	%	-	85	79	77	98
Bromofluorobenzene (Surrogate)	%	-	87	77	83	103

Summary

Total Xylenes*	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX*	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6

Volatile Petroleum Hydrocarbons in Soil Method: AN423/M424/425

TPH C6-C8	mg/kg	25	<25	<25	<25	<25
TPH C6-C9	mg/kg	20	<20	<20	<20	<20

PCP's

Dibromofluoromethane (Surrogate)	%	-	86	85	83	111
d4-1,2-dichloroethane (Surrogate)	%	-	81	79	83	111
d8-toluene (Surrogate)	%	-	85	79	77	98
Bromofluorobenzene (Surrogate)	%	-	87	77	83	103



# ANALYTICAL REPORT

SE123728 R0



**Volatile Petroleum Hydrocarbons in Soil - Method: AN433/AN434/AN410 (continued)**

Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
TRH C8-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25

**TRH (Total Recoverable Hydrocarbons) in Soil - Method: AN493**

TRH C10-C14	mg/kg	20	<20	<20	<20	<20
TRH C15-C25	mg/kg	45	<45	<45	<45	<45
TRH C26-C36	mg/kg	45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110
TRH C10-C40 Total	mg/kg	210	<210	<210	<210	<210

**TRH (F2-F4)**

TRH >C10-C16 (F2)	mg/kg	25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120

**PAH (Polycyclic Aromatic Hydrocarbons) in Soil - Method: AN410**

Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	0.3	<0.1	<0.1	0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	0.3	0.2	<0.1	0.3
Pyrene	mg/kg	0.1	0.3	0.2	<0.1	0.3
Benzo(a)anthracene	mg/kg	0.1	0.2	0.1	<0.1	0.2
Chrysene	mg/kg	0.1	0.1	0.1	<0.1	0.2
Benzo(b)fluoranthene	mg/kg	0.1	0.2	0.2	<0.1	0.2
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	0.1
Benzo(a)pyrene	mg/kg	0.1	0.1	0.1	<0.1	0.2
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Total PAHs	mg/kg	0.8	1.4	1.0	<0.8	1.6
Carcinogenic PAHs (as BaP TEQ)*	TEQ	0.2	<0.2	<0.2	<0.2	<0.2



# ANALYTICAL REPORT

SE123728 R0



## PHH (Polynuclear Aromatic Hydrocarbon) in Soil - Method: AN420 (can/mg)

	%	94	98	94	92
1-Benzene (Benzene)	%	90	82	90	82
2-Naphthyl (Naphthalene)	%	88	84	84	82

## OC Pesticides in Soil - Method: AN400/AN420

Hexachlorocyclopentadiene (HCH)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha-BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Gamma	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Delta	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Beta-BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Allyl Fenchyl Ether	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulfate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Triphenyl Methyl Ether	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Volpexolone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorocyclopentadiene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1



# ANALYTICAL REPORT

SE123728 R0



OC: Pesticides in Soil - Methion - AN400/AN420 (continued)

Tetachloro-m-xylene (TCMX) (Surrogate) % 117 113 119 113

OC: Pesticides in Soil - Surrogate in Methion (AN400)

Dichlorvos	mg/kg	0.1	<0.5	<0.5	<0.5	<0.5
Diazinon	mg/kg	0.1	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.1	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.7	<0.7	<0.7	<0.7
Methidathion	mg/kg	0.2	<0.7	<0.7	<0.7	<0.7
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.7	<0.7	<0.7	<0.7
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.7	<0.7	<0.7	<0.7
Bromophos Ethyl	mg/kg	0.2	<0.7	<0.7	<0.7	<0.7
Malathion	mg/kg	0.1	<0.5	<0.5	<0.5	<0.5
Fifluthrin	mg/kg	0.2	<0.7	<0.7	<0.7	<0.7
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.7	<0.7	<0.7	<0.7

Surrogates

2-Bromobiphenyl (Surrogate) % 90 92 90 92  
 1,4-p-Tolphenyl (Surrogate) % 90 94 94 92

PCBs in Soil - Methion - AN400/AN420

Arochlor 1216	mg/kg	0.2	<0.7	<0.7	<0.7	<0.7
Arochlor 1221	mg/kg	0.2	<0.7	<0.7	<0.7	<0.7
Arochlor 1232	mg/kg	0.2	<0.7	<0.7	<0.7	<0.7
Arochlor 1242	mg/kg	0.2	<0.7	<0.7	<0.7	<0.7
Arochlor 1244	mg/kg	0.2	<0.7	<0.7	<0.7	<0.7
Arochlor 1254	mg/kg	0.2	<0.7	<0.7	<0.7	<0.7
Arochlor 1260	mg/kg	0.2	<0.7	<0.7	<0.7	<0.7
Arochlor 1262	mg/kg	0.2	<0.7	<0.7	<0.7	<0.7
Arochlor 1268	mg/kg	0.2	<0.7	<0.7	<0.7	<0.7
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1	<1



# ANALYTICAL REPORT

SE123728 R0



## PCBs in Soil Method: AN400/AN420 (continued)

Tetrachloro-m-xylene (TCMX) (Surrogate)	%	117	113	113	113
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## Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: AN010/AN020

Arsenic, As	mg/kg	3	5	6	7	5
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.3	16	14	15	13
Copper, Cu	mg/kg	0.5	23	21	26	26
Lead, Pb	mg/kg	1	25	28	26	24
Nickel, Ni	mg/kg	0.5	11	9.1	11	7.4
Zinc, Zn	mg/kg	0.5	66	70	73	55

## Mercury in Soil Method: AN110

Mercury	mg/kg	0.01	0.05	0.05	0.08	0.03
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## Moisture Content Method: AN001

% Moisture	%	0.6	4.2	11	12	7.5
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# ANALYTICAL REPORT

SE123728 R0



WQ26 in Soil Method: AR423/AN434

11/11/2011

Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
m,p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1

11/11/2011

Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
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11/11/2011

Dibromofluoromethane (Surrogate)	%	-	94	93	106	92
d4-1,2-dichloroethane (Surrogate)	%	-	97	98	104	97
d8-toluene (Surrogate)	%	-	88	83	87	78
Bromofluorobenzene (Surrogate)	%	-	92	81	88	78

11/11/2011

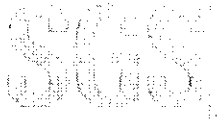
Total Xylenes*	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3
Total PTEX*	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6

WQ26a Petroleum Hydrocarbons in Soil Method: AR423/AN434/AN610

TRH 08-110	mg/kg	25	<25	<25	<25	<25
TRH 06-10	mg/kg	20	<20	<20	<20	<20

11/11/2011

Dibromofluoromethane (Surrogate)	%	-	94	93	105	92
d4-1,2-dichloroethane (Surrogate)	%	-	97	96	104	97
d8-toluene (Surrogate)	%	-	88	83	87	78
Bromofluorobenzene (Surrogate)	%	-	92	81	88	78



# ANALYTICAL REPORT

SE123728 R0



Volatile Petroleum Hydrocarbons in Soil - Method: AN433/AN434/AN410 (continued)

01/11/11

Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10 minus BTEX (F1)	mg/kg	75	<25	<25	<25	<25

TRH (Total Recoverable Hydrocarbons) in Soil - Method: AN600

TRH C10-C14	mg/kg	20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	51
TRH C29-C36	mg/kg	45	<45	<45	<45	89
TRH C37-C40	mg/kg	100	<100	<100	<100	<100
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	120
TRH C37-C40 Total	mg/kg	210	<210	<210	<210	<210

01/11/11

TRH >C10-C16 (F2)	mg/kg	25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	80	<80	<80	<80	89
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120

PAH (Polynuclear Aromatic Hydrocarbon) in Soil - Method: AN120

Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	0.2	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	0.3	0.2
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	0.2	0.2	0.4	0.3
Pyrene	mg/kg	0.1	0.5	0.2	0.4	0.3
Benzo(a)anthracene	mg/kg	0.1	0.3	0.1	0.2	0.2
Chrysene	mg/kg	0.1	0.6	0.1	0.2	0.2
Benzo(b)fluoranthene	mg/kg	0.1	0.4	0.1	0.3	0.2
Benzo(k)fluoranthene	mg/kg	0.1	0.1	<0.1	0.2	<0.1
Benzo(a)pyrene	mg/kg	0.1	0.9	<0.1	0.2	0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	0.2	<0.1	0.1	<0.1
Dibenz(a,h)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	4.1	<0.1	<0.1	<0.1
Total PAH	mg/kg	0.8	2.8	<0.9	2.3	1.4
Carcinogenic PAHs (as BaP TEQ)*	TEQ	0.2	0.4	<0.2	0.3	<0.2



# ANALYTICAL REPORT

SE123728 R0



## PAH (Polycyclic Aromatic Hydrocarbons) in Soil (Method: AN420 (continued))

Compound	Unit	80	82	92	97
d5-nitrobenzene (Surrogate)	%	80	82	92	97
2-fluorobiphenyl (Surrogate)	%	80	82	92	97
d14-p-terphenyl (Surrogate)	%	80	82	92	97

## OC Pesticides in Soil (Method: AN400, AN410)

Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Gamma	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alfa	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Kaun Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Meloxiclor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Misc	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1



# ANALYTICAL REPORT

SE123728 R0



OP Pesticides in Soil Method: AN400/AN420 (continued)

Tetrachloro-m-xylene (TCMX) (Surrogate)	%	112	117	117	110
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OP Pesticides in Soil Method: AN400/AN420

Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5
Disulfoton	mg/kg	0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2
Bromopropyl Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2
Mevinphos	mg/kg	0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2

2-fluorobiphenyl (Surrogate)	%	84	92	80	80
d14-p-terphenyl (Surrogate)	%	80	92	98	80

PCBs in Soil Method: AN400/AN420

Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1



# ANALYTICAL REPORT

SE123728 R0



## PCBS in Soil (Method: AN030/AN120 (continued))

Tetrachloro m-xylene (TCMX) (Surrogate)	%	112	117	117	110
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## Total Recoverable Metals in Soil by ICPCES from EPA 200.2 (ppm) (Method: AN040/AN120)

Arsenic, As	mg/kg	2	8	5	6	4
Cadmium, Cd	mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	63	14	18	12	13
Copper, Cu	mg/kg	0.5	22	28	22	35
Lead, Pb	mg/kg	1	21	28	23	27
Nickel, Ni	mg/kg	0.5	11	12	9.4	6.7
Zinc, Zn	mg/kg	0.5	110	76	66	92

## Mercury in Soil (Method: 60.112)

Mercury	mg/kg	0.02	0.03	0.03	0.03	0.01
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## Moisture Content (Method: APP02)

% Moisture	%	0.5	6.6	3.2	3.1	6.2
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ANALYTICAL REPORT

SE123728 R0



VOCs in Soil Method: AN43/AN44

10/10/2010

Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1

Phenols in Soil

Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
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Surrogates

Dibromofluoromethane (Surrogate)	%	-	100	118	77	70
d4-1,2-dichloroethane (Surrogate)	%	-	103	116	81	76
d8-toluene (Surrogate)	%	-	84	88	96	98
Bromofluorobenzene (Surrogate)	%	-	88	89	84	80

Notes

Total Xylenes*	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3
Total HHC's*	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6

Volatile Petroleum Hydrocarbons in Soil Method: AN43/AN44/AN410

TPH C6-C10	mg/kg	26	<25	<25	<25	<25
TPH C6-C9	mg/kg	26	<20	<20	<20	<20

Surrogates

Dibromofluoromethane (Surrogate)	%	-	100	118	77	70
d4-1,2-dichloroethane (Surrogate)	%	-	103	119	81	76
d8-toluene (Surrogate)	%	-	84	96	98	98
Bromofluorobenzene (Surrogate)	%	-	88	89	84	80



# ANALYTICAL REPORT

SE123728 R0



Volatile Petroleum Hydrocarbons in Soil - Method: AN433/AN434/AN410 (continued)

0.11.11

Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25

TRH (Total Recoverable Hydrocarbons) in Soil - Method: AN433

TRH C10-C14	mg/kg	20	<20	<20	<20	<20
TRH C15-C24	mg/kg	45	<45	<45	<45	<45
TRH C25-C34	mg/kg	45	<45	<45	<45	<45
TRH C35-C40	mg/kg	100	<100	<100	<100	<100
TRH C10-C40 total	mg/kg	110	<110	<110	<110	<110
TRH C10-C40 Total	mg/kg	210	<210	<210	<210	<210

0.11.12

TRH >C10-C16 (F2)	mg/kg	25	<25	<25	<25	<25
TRH >C18-C34 (F3)	mg/kg	90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120

PAH (Polynuclear Aromatic Hydrocarbons) in Soil - Method: AN420

Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	0.2	0.2
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	0.1	0.1	0.4	0.3
Pyrene	mg/kg	0.1	0.1	0.1	0.3	0.3
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	0.3	0.2
Chrysene	mg/kg	0.1	<0.1	<0.1	0.3	0.2
Benzo(b)fluoranthene	mg/kg	0.1	<0.1	<0.1	0.3	0.2
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	0.1	0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	0.1	0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	0.1	<0.1
Total PAH	mg/kg	0.8	<0.8	<0.8	2.6	1.7
Carcinogenic PAHs (as BaP TEQ)*	TEQ	0.2	<0.2	<0.2	0.3	<0.2



# ANALYTICAL REPORT

SE123728 R0

**PAH (Polycyclic Aromatic Hydrocarbons) in Soil - Method: AN420 (continued)**

	%	94	92	104	102
d5-nitrobenzene (Surrogate)	%	94	92	104	102
2-fluorobiphenyl (Surrogate)	%	92	92	98	92
d14-p-terphenyl (Surrogate)	%	92	96	92	98

**OC Pesticides in Soil - Method: AN40/AN420**

Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alfa	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Beta PHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlorthane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Exxon Hexene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Isalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1



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OC Pesticides in Soil Method: AN400/AN420 (continued)

Totachloro-m-xylene (TCMX) (Surrogate)	%	109	111	85	86
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OC Pesticides in Soil Method: AN400/AN420

Dichlorvos	mg/kg	0.4	<0.5	<0.5	<0.5	<0.5
Dibellatolol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
Fenathion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Subion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2

2-fluorobiphenyl (Surrogate)	%	82	82	88	82
d14-p-terphenyl (Surrogate)	%	82	95	82	88

PCBs in Soil Method: AN400/AN420

Arochlor 1098	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1237	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1	<1



# ANALYTICAL REPORT

SE123728 R0



## PCBs in Soil Method: AN400/AN420 (continued)

Tetrachloro-m-xylene (TCMX) (Surrogate)	%	10%	11%	6%	9%
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## Total Recoverable Metals in Soil by ICPEES from EPA 200.5 Digest Method: AN040/AN026

Arsenic, As	mg/kg	3	4	<3	5	3
Cadmium, Cd	mg/kg	<0.3	<0.3	<0.3	0.3	<0.3
Chromium, Cr	mg/kg	0.3	11	10	21	12
Copper, Cu	mg/kg	0.9	24	49	37	59
Lead, Pb	mg/kg	1	23	9	42	27
Nickel, Ni	mg/kg	0.4	7.1	11	33	19
Zinc, Zn	mg/kg	0.4	84	61	100	100

## Mercury in Soil Method: AN110

Mercury	mg/kg	0.01	0.03	0.03	0.03	<0.01
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## Moisture Content Method: AN002

% Moisture	%	11.5	2.3	2.9	3.3	1.6
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# ANALYTICAL REPORT

SE123728 R0



### VOC in Soil - Method: AN431AN11

Detailed description of the sample

Compound	Unit	Value	Limit 1	Limit 2	Limit 3	Limit 4
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1

Other VOCs

Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
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Summary

Dibromofluoromethane (Surrogate)	%	107	108	113	72
d1-1,2-dichloroethane (Surrogate)	%	98	112	117	78
d8-toluene (Surrogate)	%	90	89	87	88
Bromofluorobenzene (Surrogate)	%	83	86	89	83

Notes

Total Xylenes*	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX*	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6

### Chlorinated Hydrocarbons in Soil - Method: AN431AN110

THH C6-C8	mg/kg	25	<25	<25	<25	<25
THH C6-C9	mg/kg	20	<20	<20	<20	<20

Summary

Dibromofluoromethane (Surrogate)	%	107	108	113	72
d4-1,2-dichloroethane (Surrogate)	%	98	112	117	78
d8-toluene (Surrogate)	%	90	89	87	88
Bromofluorobenzene (Surrogate)	%	83	86	89	83



ANALYTICAL REPORT

SE123728 R0



Volatile Petroleum Hydrocarbons in Soil Method: AN417/AN434/AN410 (continued)

(continued)

Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25

TRH - Total Recoverable (hydrocarbons) in Soil Method: AN463

TRH C10-C14	mg/kg	20	<20	<20	<20	<20
TRH C15-C20	mg/kg	45	<45	<45	<45	<45
TRH C20-C25	mg/kg	45	<45	<45	<45	<45
TRH C27-C40	mg/kg	100	<100	<100	<100	<100
TRH C10-C26 Total	mg/kg	110	<110	<110	<110	<110
TRH C10-C40 Total	mg/kg	210	<210	<210	<210	<210

(continued)

TRH >C10-C16 (F2)	mg/kg	25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120

PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420

Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	0.7
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	0.1
Pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Total PAH	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8
Carcinogenic PAHs (as EAP TEQ)*	TEQ	0.2	<0.2	<0.2	<0.2	<0.2



ANALYTICAL REPORT

SE123728 R0



PAH (Polycyclic Aromatic Hydrocarbons) in Soil Method: AN420 (continued)

o5-nitrobenzene (Surrogate)	%	86	90	92	94
2-fluorobiphenyl (Surrogate)	%	90	92	95	92
d14-p-terphenyl (Surrogate)	%	92	92	93	94

OC Pesticides in Soil Method: AN400/AN470

Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Gamma BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
trans Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endrin ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Deca	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1



ANALYTICAL REPORT

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MU-14-10000-01-001 (Method: AN400/AN420 (continued))

11/11/11

Tetrachloro-m-xylene (TCMX) (Surrogate) % 117 85 113 128

OP Herbicides (Surrogate) (Method: AN400/AN420)

Table with 7 columns: Compound Name, Unit, and five numerical values. Rows include Dithiopyr, Dimethoate, Diazinon, Fenitrothion, Malathion, Chlorpyrifos, Para-thion, Bromophos, Azinphos, and Guthion.

11/11/11

2-fluorobiphenyl (Surrogate) % 90 82 80 82
d14-p-terphenyl (Surrogate) % 82 82 82 84

PCBs in Soil (Surrogate) (Method: AN400/AN420)

Table with 7 columns: Anachlor name, Unit, and five numerical values. Rows include Anachlor 1019, 1221, 1233, 1247, 1248, 1254, 1260, 1262, 1268, and Total PCBs.



# ANALYTICAL REPORT

SE123728 R0



PCBs in Soil - Method: AN430/AN420 (continued)

Tetrachloro-m-xylene (TCMX) (Surrogate)	%		117	85	111	128
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Total Recoverable Metals in Soil by ICP/OES from EPA 299 B Digest - Method: AN340/AN350

Arsenic, As	mg/kg	3	6	3	4	4
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	0.3
Chromium, Cr	mg/kg	93	11	12	13	18
Copper, Cu	mg/kg	88	100	180	140	130
Lead, Pb	mg/kg	1	16	9	13	19
Nickel, Ni	mg/kg	88	12	18	12	41
Zinc, Zn	mg/kg	85	87	88	48	91

Mercury in Soil - Method: 80312

Mercury	mg/kg	0.01	0.02	0.02	0.01	0.03
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Moisture Content - Method: AN337

% Moisture	%	0.5	19	7.9	8.8	5.8
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# ANALYTICAL REPORT

SE123728 R0



**VOCs in Soil Method: AN43/AN434**

Et benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
m/p xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1

**Trichloroethenes**

Napthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
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**Surrogates**

Dibromofluoromethane (Surrogate)	%		73	77	100	73
m-1,2-dichloroethane (Surrogate)	%		78	83	85	77
d8-toluene (Surrogate)	%		85	105	98	101
Bromofluorobenzene (Surrogate)	%		70	89	97	83

Total Xylenes*	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX*	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6

**Volatile Polychlorinated Biphenyls in Soil Method: AN43/AN434/AN435**

TCDFs	mg/kg	25	<25	<25	<25	<25
HxCDFs	mg/kg	29	<29	<29	<29	<29

Dibromofluoromethane (Surrogate)	%		73	77	100	73
m-1,2-dichloroethane (Surrogate)	%		78	83	85	77
d8-toluene (Surrogate)	%		85	105	98	101
Bromofluorobenzene (Surrogate)	%		70	89	97	83



# ANALYTICAL REPORT

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**Volatile Petroleum Hydrocarbons in Soil - Method: AN135/AN434/AN410 (continued)**

Method: AN135

Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10 minus BTEX (F1)	mg/kg	20	<25	<25	<25	<25

**TRH (Total Recoverable Hydrocarbons) in Soil - Method: AN401**

TRH C10-C14	mg/kg	20	<20	<20	88	<20
TRH C15-C28	mg/kg	45	<45	<45	1800	<45
TRH C29-C35	mg/kg	45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100
TRH C10-C35 Total	mg/kg	110	<110	<110	1800	<110
TRH C10-C40 Total	mg/kg	210	<210	<210	1800	<210

Method: AN135

TRH >C10-C16 (F2)	mg/kg	25	<25	<25	300	<25
TRH >C18-C34 (F3)	mg/kg	90	<90	<90	1400	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120

**PAH (Polycyclic Aromatic Hydrocarbons) in Soil - Method: AN420**

Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	0.2	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	0.2	0.4	<0.1
Benzofluoranthene	mg/kg	0.1	<0.1	0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	<0.1	0.1	<0.1	<0.1
Benzo(b)fluoranthene	mg/kg	0.1	<0.1	0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Total PAH	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8
Carcinogenic PAHs (as BaP TEQ)*	TEQ	0.2	<0.2	<0.2	<0.2	<0.2



# ANALYTICAL REPORT

SE123728 R0



PCP (Polychlorinated Biphenyls) in Soil Method: AN400/AN410

PCP (Polychlorinated Biphenyls) in Soil	01	02	03	04	05
1,2,4-Trichlorobenzene (Sum of all)	0.1	<0.1	<0.1	<0.1	<0.1
2,3,6-Trichlorobenzene (Sum of all)	0.1	<0.1	<0.1	<0.1	<0.1
1,2,3-Trichlorobenzene (Sum of all)	0.1	<0.1	<0.1	<0.1	<0.1

OC Pesticides in Soil Method: AN400/AN410

OC Pesticides in Soil	01	02	03	04	05	
Hexachlorocyclopentadiene (HCH)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha-BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Gamma-BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Delta-BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
alpha-BDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha-chlordane	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Gamma-chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha-Dieldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Kama-chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
beta-BDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Deltamethrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
alpha-BDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
alpha-BDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Beta-Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
gamma-BDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
gamma-BDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endrin-Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Methoxy-DEP	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Mets	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1



ANALYTICAL REPORT

SE123728 R0



OP Pesticides in Soil Method: AN400/AN420 (continued)

Tetrachloro-m-xylene (TCMX) (Surrogate) % 114 115 104 117

OP Pesticides in Soil Method: AN400/AN420

Table with 6 columns: Compound Name, Unit, and values for samples 114, 115, 104, 117. Rows include Dichlorvos, Endosulfate, Diazinon (Dimpylate), Fenitrothion, Malathion, Chlorpyrifos (Chlorpyrifos Ethyl), Parathion-ethyl (Parathion), Bromopropyl Ethyl, Imidacloprid, Terbufos, and Azinphos-methyl (Culbion).

2-Fluorobiphenyl (Surrogate) % 88 89 88 90
014 p-terphenyl (Surrogate) % 88 92 104 92

PCBs in Soil Method: AN400/AN420

Table with 6 columns: PCB Name, Unit, and values for samples 114, 115, 104, 117. Rows include Arochlor 1218, Arochlor 1221, Arochlor 1232, Arochlor 1242, Arochlor 1248, Arochlor 1254, Arochlor 1260, Arochlor 1262, Arochlor 1259, and Total PCBs (Arochlors).



# ANALYTICAL REPORT

SE123728 R0



### PCBs in Soil Method: AN006/AN020 (continued)

(continued)

Tetrachloro-m-xylene (TCMX) (Surrogate)	%	114	119	104	117
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### Total Resolvable Metals in Soil by EFL/ES from EPA 200.3 Digest Method: AN006/AN020

Arsenic, As	mg/kg	3	4	3	3	6
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	0.3
Chromium, Cr	mg/kg	9.3	14	15	13	22
Copper, Cu	mg/kg	5.5	120	39	160	110
Lead, Pb	mg/kg	1	14	19	12	26
Nickel, Ni	mg/kg	0.5	13	18	16	9.8
Zinc, Zn	mg/kg	0.5	76	82	77	45

### Mercury in Soil Method: AN006/AN020

Mercury	mg/kg	0.03	0.02	0.01	0.02	0.02
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### Moisture Content Method: AN002

% Moisture	%	0.5	13	4.5	9.8	8.5
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# ANALYTICAL REPORT

SE123728 R0



VOC's in Soil Method: AN4324-N434

Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
m,p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1

Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	0.1
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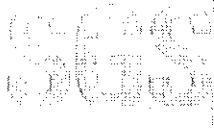
Dibromofluoromethane (Surrogate)	%		106	94	115	97
d4-1,2-dichloroethane (Surrogate)	%		108	97	118	101
d8-toluene (Surrogate)	%		79	93	93	77
Bromofluorobenzene (Surrogate)	%		87	83	99	94

Total Xylenes*	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX*	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6

Volatile Hydrocarbon Hydrocarbons in Soil Method: AN4324-N434-N435

1RH C6-C8	mg/kg	25	<25	<25	<25	<25
1RH C6-C9	mg/kg	29	<29	<29	<29	<29

Dibromofluoromethane (Surrogate)	%		105	94	115	97
d4-1,2-dichloroethane (Surrogate)	%		106	97	119	101
d8-toluene (Surrogate)	%		79	93	93	77
Bromofluorobenzene (Surrogate)	%		87	83	99	94



# ANALYTICAL REPORT

SE123728 R0



**Volatile Petroleum Hydrocarbons in Soil - Method: AN437/AN434/AN410 (continued)**

Site: 111

Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25

**TRH (Total Recoverable Hydrocarbons) in Soil - Method: AN403**

TRH C10-C14	mg/kg	20	<20	<20	<20	260
TRH C15-C20	mg/kg	40	<40	<40	8500	12000
TRH C20-C30	mg/kg	45	<45	<45	3300	21000
TRH C30-C40	mg/kg	100	<100	<100	1500	9000
TRH C10-C30 Total	mg/kg	110	<110	<110	18000	34000
TRH C10-C40 Total	mg/kg	210	<210	<210	18000	43000

Site: 111

TRH >C10-C16 (F2)	mg/kg	25	<25	<25	<25	410
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	15000	26000
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	4000	18000

**PAH (Polycyclic Aromatic Hydrocarbon) in Soil - Method: AN403**

Naphthalene	mg/kg	0.1	0.1	0.2	<0.2	<0.5
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.2	1.0
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.2	1.0
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.2	<0.5
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.2	<0.5
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.2	<0.5
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.2	<0.5
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.2	<0.5
Phenanthrene	mg/kg	0.1	<0.1	0.2	0.2	<0.5
Pyrene	mg/kg	0.1	0.1	0.2	0.5	0.5
Benzo(a)anthracene	mg/kg	0.1	<0.1	0.1	<0.2	<0.5
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.2	<0.5
Benzo(b)fluoranthene	mg/kg	0.1	<0.1	0.1	<0.2	<0.5
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.2	<0.5
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.2	<0.5
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.2	<0.5
Dibenz(a,h)anthracene	mg/kg	0.1	<0.1	<0.1	<0.2	<0.5
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.2	<0.5
Total PAH	mg/kg	0.8	<0.8	<0.8	<1.0	<1.0
Carcinogenic PAHs (as BaP TEQ)*	TEQ	0.2	<0.2	<0.2	<0.4	<1.0



# ANALYTICAL REPORT

SE123728 R0



PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 (unstrund)

d5-nitrobenzene (Surrogate)	%	84	84	85	112
2-fluorobiphenyl (Surrogate)	%	92	92	92	92
d14-p-terphenyl (Surrogate)	%	84	86	84	86

OC Pesticides in Soil Method: AN450/AN420

Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Gamma	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alfen	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Delta	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1



ANALYTICAL REPORT

SE123728 R0



OC Pesticides in Soil Method: AN450/AN420 (continued)

Tetrachloro-m-xylene (TCMX) (Surrogate) % 110 110 120 119

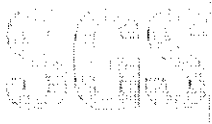
OP Pesticides in Soil Method: AN450/AN420

Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dempylet)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
Forchlorfen	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Parathion ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Effthio	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Azinphos methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2

2-Fluorobiphenyl (Surrogate) % 92 92 92 92  
 d14-p-terphenyl (Surrogate) % 84 84 84 84

PCBs in Soil Method: AN400/AN450

Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1	<1



# ANALYTICAL REPORT

SE123728 R0



## PCBs in Soil Method: AN403/AN420 (continued)

	5	11F	11D	126	11F
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## Total Recoverable Metals in Soil by UPOES from EPA 290.3 Digest Method: AN040/AN320

Arsenic, As	mg/kg	3	<3	<3	<3	<3
Cadmium, Cd	mg/kg	0.1	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.1	12	15	11	11
Copper, Cu	mg/kg	0.5	71	49	28	40
Lead, Pb	mg/kg	1	14	18	19	19
Nickel, Ni	mg/kg	0.5	12	17	13	15
Zinc, Zn	mg/kg	0.5	78	65	130	100

## Mercury in Soil Method: M1010

Mercury	mg/kg	0.01	0.01	0.01	0.01	0.01
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## Moisture Content Method: AN001

% Moisture	%	0.5	4.3	3.0	1.3	1.1
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## QC SUMMARY

SE123728 R0

MB blank results are compared to the Limit of Reporting  
 LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared to the amount of analyte spiked into the sample  
 DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA', the results are less than the LOR and thus the RPD is not applicable

Method: ME (A) (M) (R) (V) (W) (X) (Y) (Z)

Method	Sample	Method	ME (A)	(M)	(R)	(V)	(W)	(X)	(Y)	(Z)
Mercury	1B050713	mg/kg	0.01	<0.01	2.33	100%	94%			
	1B050714	mg/kg	0.01	<0.01	3.0%	100%	13%			

Method: ME (A) (M) (R) (V) (W) (X) (Y) (Z)

Method	Sample	Method	ME (A)	(M)	(R)	(V)	(W)	(X)	(Y)	(Z)
Hexachlorobenzene (HCB)	1B050632	mg/kg	0.1	<0.1	0%	NA	NA			
	1B050633	mg/kg	0.1	<0.1	0%	NA	NA			
Alpha BHC	1B050632	mg/kg	0.1	<0.1	0%	NA	NA			
	1B050633	mg/kg	0.1	<0.1	0%	NA	NA			
Dieldrin	1B050632	mg/kg	0.1	<0.1	0%	NA	NA			
	1B050633	mg/kg	0.1	<0.1	0%	NA	NA			
Heptachlor	1B050632	mg/kg	0.1	<0.1	0%	80%	90%			
	1B050633	mg/kg	0.1	<0.1	0%	90%	85%			
Aldrin	1B050632	mg/kg	0.1	<0.1	0%	80%	90%			
	1B050633	mg/kg	0.1	<0.1	0%	90%	85%			
Beta BHC	1B050632	mg/kg	0.1	<0.1	0%	NA	NA			
	1B050633	mg/kg	0.1	<0.1	0%	NA	NA			
Gamma BHC	1B050632	mg/kg	0.1	<0.1	0%	55%	80%			
	1B050633	mg/kg	0.1	<0.1	0%	75%	70%			
Heptachlor epoxide	1B050632	mg/kg	0.1	<0.1	0%	NA	NA			
	1B050633	mg/kg	0.1	<0.1	0%	NA	NA			
o,p'-DDE	1B050632	mg/kg	0.1	<0.1	0%	NA	NA			
	1B050633	mg/kg	0.1	<0.1	0%	NA	NA			
Alpha Endosulfan	1B050632	mg/kg	0.2	<0.2	0%	NA	NA			
	1B050633	mg/kg	0.2	<0.2	0%	NA	NA			
Gamma Chlordane	1B050632	mg/kg	0.1	<0.1	0%	NA	NA			
	1B050633	mg/kg	0.1	<0.1	0%	NA	NA			
Alpha Chlordane	1B050632	mg/kg	0.1	<0.1	0%	NA	NA			
	1B050633	mg/kg	0.1	<0.1	0%	NA	NA			
trans-nonachlor	1B050632	mg/kg	0.1	<0.1	0%	NA	NA			
	1B050633	mg/kg	0.1	<0.1	0%	NA	NA			
p,p'-DDE	1B050632	mg/kg	0.1	<0.1	0%	NA	NA			
	1B050633	mg/kg	0.1	<0.1	0%	NA	NA			
Endrin	1B050632	mg/kg	0.2	<0.2	0%	80%	80%			
	1B050633	mg/kg	0.2	<0.2	0%	80%	85%			
o,p'-DDD	1B050632	mg/kg	0.1	<0.1	0%	NA	NA			
	1B050633	mg/kg	0.1	<0.1	0%	NA	NA			
o,p'-DDT	1B050632	mg/kg	0.1	<0.1	0%	NA	NA			
	1B050633	mg/kg	0.1	<0.1	0%	NA	NA			
trans-Etoxobenzene	1B050632	mg/kg	0.2	<0.2	0%	NA	NA			
	1B050633	mg/kg	0.2	<0.2	0%	NA	NA			
p,p'-DDD	1B050632	mg/kg	0.1	<0.1	0%	NA	NA			
	1B050633	mg/kg	0.1	<0.1	0%	NA	NA			
p,p'-DDT	1B050632	mg/kg	0.2	<0.2	0%	70%	75%			
	1B050633	mg/kg	0.2	<0.2	0%	85%	80%			
Endosulfan sulphate	1B050632	mg/kg	0.1	<0.1	0%	NA	NA			
	1B050633	mg/kg	0.1	<0.1	0%	NA	NA			
Endrin Aldehyde	1B050632	mg/kg	0.1	<0.1	0%	NA	NA			
	1B050633	mg/kg	0.1	<0.1	0%	NA	NA			
Methoxychlor	1B050632	mg/kg	0.1	<0.1	0%	NA	NA			
	1B050633	mg/kg	0.1	<0.1	0%	NA	NA			
Endrin ketone	1B050632	mg/kg	0.1	<0.1	0%	NA	NA			
	1B050633	mg/kg	0.1	<0.1	0%	NA	NA			
Dieldrin	1B050632	mg/kg	0.1	<0.1	0%	NA	NA			
	1B050633	mg/kg	0.1	<0.1	0%	NA	NA			



# QC SUMMARY

SE123728 R0

MB blank results are compared to the Limit of Reporting

LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared to the amount of analyte spiked into the sample

DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula *(the absolute difference of the two results divided by the average of the two results as a percentage)*. Where the DUP RPD is 'NA', the results are less than the LOR and thus the RPD is not applicable

QC Procedures in Use: (Actual: M-140) (Target: M-140) (Standard)

Sample	Lab	Unit	Result	LOD	RPD	MSD	MSD RPD
MB	LB050633	mg/kg	0.1	<LOD	0%	NA	NA
	LB050632	mg/kg	0.1	<LOD	0%	NA	NA
	LB050633	mg/kg	0.1	<LOD	0%	NA	NA
Tetrachloro-m-xylene (TCMX) (Surrogate)	LB050632	%	100%	7 - 12%	103%	115%	
	LB050633	%	100%	7 - 12%	9%	101%	



# QC SUMMARY

SE123728 R0

MB blank results are compared to the Limit of Reporting

LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the amount of analyte spiked into the sample

DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: *the absolute difference of the two results divided by the average of the two results as a percentago*. Where the DUP RPD is 'NA', the results are less than the LOR and thus the RPD is not applicable

01 1 2016 06:14:24 (Method: GC/MS) (File: J:\AN10P\AN10P)

Compound	Concentration (mg/kg)	LOD (mg/kg)	LOQ (mg/kg)	RPD (%)	MSD (%)	DUP (%)
Diflufenox	1.005052	0.5	<0.5	0%	104%	106%
	1.005053	0.5	<0.5	0%	105%	105%
Dinoseb	1.005052	0.5	<0.5	0%	NA	NA
	1.005053	0.5	<0.5	0%	NA	NA
Diazinon (Dimpylate)	1.005052	0.5	<0.5	0%	114%	117%
	1.005053	0.5	<0.5	0%	105%	110%
Fenitrothion	1.005052	0.2	<0.2	0%	NA	NA
	1.005053	0.2	<0.2	0%	NA	NA
Malathion	1.005052	0.2	<0.2	0%	NA	NA
	1.005053	0.2	<0.2	0%	NA	NA
Chlorpyrifos (Chlorpyrifos Ethyl)	1.005052	0.2	<0.2	0%	110%	120%
	1.005053	0.2	<0.2	0%	120%	123%
Parathion-ethyl (Parathion)	1.005052	0.2	<0.2	0%	NA	NA
	1.005053	0.2	<0.2	0%	NA	NA
Bromophos Ethyl	1.005052	0.2	<0.2	0%	NA	NA
	1.005053	0.2	<0.2	0%	NA	NA
Methidathion	1.005052	0.5	<0.5	0%	NA	NA
	1.005053	0.5	<0.5	0%	NA	NA
Ethion	1.005052	0.2	<0.2	0%	96%	102%
	1.005053	0.2	<0.2	0%	101%	105%
Azinphos-methyl (Guthion)	1.005052	0.2	<0.2	0%	NA	NA
	1.005053	0.2	<0.2	0%	NA	NA

Compound	Concentration (%)	LOD (%)	LOQ (%)	RPD (%)	MSD (%)	DUP (%)
2-fluorobiphenyl (Surrogate)	1.005052	0.5	<0.5	0%	86%	94%
	1.005053	0.5	<0.5	0%	90%	92%
d14-p-terphenyl (Surrogate)	1.005052	0.5	<0.5	0%	86%	88%
	1.005053	0.5	<0.5	0%	96%	88%



# QC SUMMARY

SE123728 R0

MB blank results are compared to the Limit of Reporting

LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared to the amount of analyte spiked into the sample.

DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA', the results are less than the LOR and thus the RPD is not applicable.

PAH (Polycyclic Aromatic Hydrocarbon) List - Method 8270A (EPA/8270-A-02)

Compound	Method	Unit	LOD	LOQ	Recovery	DUP RPD	MSD RPD
Naphthalene	1.0050032	mg/kg	0.1	<0.1	2%	114%	90%
	1.0050033	mg/kg	0.1	<0.1	2%	87%	88%
2-methylnaphthalene	1.0050032	mg/kg	0.1	<0.1	5%	NA	NA
	1.0050033	mg/kg	0.1	<0.1	6%	NA	NA
1-methylnaphthalene	1.0050032	mg/kg	0.1	<0.1	0%	NA	NA
	1.0050033	mg/kg	0.1	<0.1	0%	NA	NA
Acenaphthylene	1.0050032	mg/kg	0.1	<0.1	0%	115%	85%
	1.0050033	mg/kg	0.1	<0.1	0%	105%	89%
Acenaphthene	1.0050032	mg/kg	0.1	<0.1	0%	117%	91%
	1.0050033	mg/kg	0.1	<0.1	0%	87%	89%
Fluorene	1.0050032	mg/kg	0.1	<0.1	0%	NA	NA
	1.0050033	mg/kg	0.1	<0.1	0%	NA	NA
Phenanthrene	1.0050032	mg/kg	0.1	<0.1	0 - 17%	112%	89%
	1.0050033	mg/kg	0.1	<0.1	0 - 33%	88%	87%
Anthracene	1.0050032	mg/kg	0.1	<0.1	0%	112%	84%
	1.0050033	mg/kg	0.1	<0.1	0%	103%	83%
Fluoranthene	1.0050032	mg/kg	0.1	<0.1	20 - 55%	110%	91%
	1.0050033	mg/kg	0.1	<0.1	18 - 46%	92%	91%
Pyrene	1.0050032	mg/kg	0.1	<0.1	23 - 35%	103%	71%
	1.0050033	mg/kg	0.1	<0.1	10 - 33%	85%	81%
Benzo(a)anthracene	1.0050032	mg/kg	0.1	<0.1	23 - 35%	NA	NA
	1.0050033	mg/kg	0.1	<0.1	0 - 10%	NA	NA
Chrysene	1.0050032	mg/kg	0.1	<0.1	10 - 22%	NA	NA
	1.0050033	mg/kg	0.1	<0.1	0%	NA	NA
Benzo(b)fluoranthene	1.0050032	mg/kg	0.1	<0.1	14 - 43%	NA	NA
	1.0050033	mg/kg	0.1	<0.1	0 - 0%	NA	NA
Benzo(k)fluoranthene	1.0050032	mg/kg	0.1	<0.1	0 - 0%	NA	NA
	1.0050033	mg/kg	0.1	<0.1	0%	NA	NA
Benzo(a)pyrene	1.0050032	mg/kg	0.1	<0.1	0 - 10%	123%	73%
	1.0050033	mg/kg	0.1	<0.1	0%	75%	72%
Indeno(1,2,3-cd)pyrene	1.0050032	mg/kg	0.1	<0.1	0%	NA	NA
	1.0050033	mg/kg	0.1	<0.1	0%	NA	NA
Dibenzo(a,h)anthracene	1.0050032	mg/kg	0.1	<0.1	0%	NA	NA
	1.0050033	mg/kg	0.1	<0.1	0%	NA	NA
Benzo(ghi)perylene	1.0050032	mg/kg	0.1	<0.1	0%	NA	NA
	1.0050033	mg/kg	0.1	<0.1	0%	NA	NA
Total PAH	1.0050032	mg/kg	0.0	<0.0	10 - 20%	NA	NA
	1.0050033	mg/kg	0.0	<0.0	0%	NA	NA
Carcinogenic PAHs (as BaP TEQ)	1.0050032	TEQ	0.2	<0.2	0 - 14%	NA	NA
	1.0050033	TEQ	0.2	<0.2	0%	NA	NA

Surrogate	Method	Unit	LOD	LOQ	Recovery	DUP RPD	MSD RPD
d5-nitrobenzene (Surrogate)	1.0050032	%	-	-	88%	2%	90%
	1.0050033	%	-	-	94%	1 - 4%	94%
2-fluorobiphenyl (Surrogate)	1.0050032	%	-	-	86%	2%	94%
	1.0050033	%	-	-	90%	0 - 6%	92%
d14-p-terphenyl (Surrogate)	1.0050032	%	-	-	85%	2%	86%
	1.0050033	%	-	-	85%	4 - 6%	81%



# QC SUMMARY

SE123728 R0

MB blank results are compared to the Limit of Reporting  
 LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared to the amount of analyte spiked into the sample  
 DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA', the results are less than the LOR and thus the RPD is not applicable

PCBs by Spill Method: ME (A) (ENV)AN00AN123

Sample ID	Method	Unit	Result	LOR	RPD	MSD	DUP
Arochlor 1010	LB050632	mg/kg	0.2	<0.2	0%	NA	NA
	LB050633	mg/kg	0.2	<0.2	0%	NA	NA
Arochlor 1221	LB050632	mg/kg	0.2	<0.2	0%	NA	NA
	LB050633	mg/kg	0.2	<0.2	0%	NA	NA
Arochlor 1232	LB050632	mg/kg	0.2	<0.2	0%	NA	NA
	LB050633	mg/kg	0.2	<0.2	0%	NA	NA
Arochlor 1242	LB050632	mg/kg	0.2	<0.2	0%	NA	NA
	LB050633	mg/kg	0.2	<0.2	0%	NA	NA
Arochlor 1248	LB050632	mg/kg	0.2	<0.2	0%	NA	NA
	LB050633	mg/kg	0.2	<0.2	0%	NA	NA
Arochlor 1254	LB050632	mg/kg	0.2	<0.2	0%	NA	NA
	LB050633	mg/kg	0.2	<0.2	0%	NA	NA
Arochlor 1260	LB050632	mg/kg	0.2	<0.2	0%	95%	105%
	LB050633	mg/kg	0.2	<0.2	0%	101%	124%
Arochlor 1262	LB050632	mg/kg	0.2	<0.2	0%	NA	NA
	LB050633	mg/kg	0.2	<0.2	0%	NA	NA
Arochlor 1268	LB050632	mg/kg	0.2	<0.2	0%	NA	NA
	LB050633	mg/kg	0.2	<0.2	0%	NA	NA
Total PCBs (Arochlors)	LB050632	mg/kg	7	<7	0%	NA	NA
	LB050633	mg/kg	7	<7	0%	NA	NA

Sample ID	Method	Unit	Result	LOR	RPD	MSD	DUP
Tetrachloro-m-xylene (TCMX) (Surrogate)	LB050632	%	100%	7-12%	93%	117%	
	LB050633	%	100%	7-12%	93%	117%	

Total Recoverable Metals by Spill by CPDLS from EPA 200.8-D-01-01 Method: ME (A) (ENV)AN00AN123

Sample ID	Method	Unit	Result	LOR	RPD	MSD	DUP
Arsenic, As	LB050708	mg/kg	3	<3	4-23%	60%	76%
	LB050710	mg/kg	3	<3	15-39%	97%	11%
Cadmium, Cd	LB050708	mg/kg	0.3	<0.3	2-11%	107%	39%
	LB050710	mg/kg	0.3	<0.3	0-2%	16%	73%
Chromium, Cr	LB050708	mg/kg	0.3	<0.3	13-37%	154%	83%
	LB050710	mg/kg	0.3	<0.3	18-26%	100%	69%
Copper, Cu	LB050708	mg/kg	0.5	<0.5	2-6%	93%	160%
	LB050710	mg/kg	0.5	<0.5	4-15%	96%	77%
Lead, Pb	LB050708	mg/kg	1	<1	2-11%	101%	20%
	LB050710	mg/kg	1	<1	10-15%	56%	72%
Nickel, Ni	LB050708	mg/kg	0.5	<0.5	1-8%	103%	86%
	LB050710	mg/kg	0.5	<0.5	4-22%	100%	77%
Zinc, Zn	LB050708	mg/kg	0.5	<0.5	5-15%	104%	124%
	LB050710	mg/kg	0.5	<0.5	13-29%	100%	85%



# QC SUMMARY

SE123728 R0

MB blank results are compared to the Limit of Reporting

LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared to the amount of analyte spiked into the sample

DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA', the results are less than the LOR and thus the RPD is not applicable.

TRH (Total Recovered) - Hydrocarbons (Sed) - Method: MS (A)(U)(V)A-400

Sample	Lab ID	Unit	Value	Limit	RPD	MSD	MSD%
TRH C10-C14	LB050612	mg/kg	20	<20	0%	90%	11%
	LB050613	mg/kg	20	<20	0%	103%	3%
TRH C15-C18	LB050612	mg/kg	45	<45	0%	93%	7%
	LB050613	mg/kg	45	<45	0%	100%	13%
TRH C20-C26	LB050612	mg/kg	45	<45	0%	70%	73%
	LB050613	mg/kg	45	<45	0%	81%	69%
TRH C27-C40	LB050612	mg/kg	100	<100	0%	NA	NA
	LB050613	mg/kg	100	<100	0%	NA	NA
TRH C10-C40 Total	LB050612	mg/kg	110	<110	0%	NA	NA
	LB050613	mg/kg	110	<110	0%	NA	NA
TRH C10-C40 Total	LB050612	mg/kg	210	<210	0%	NA	NA
	LB050613	mg/kg	210	<210	0%	NA	NA

TRH (F)

Sample	Lab ID	Unit	Value	Limit	RPD	MSD	MSD%
TRH >C10-C16 (F2)	LB050632	mg/kg	25	<25	0%	95%	5%
	LB050633	mg/kg	25	<25	0%	108%	13%
TRH >C16-C34 (F3)	LB050632	mg/kg	100	<100	0%	90%	10%
	LB050633	mg/kg	90	<90	0%	100%	10%
TRH >C34-C40 (F4)	LB050632	mg/kg	120	<120	0%	50%	NA
	LB050633	mg/kg	120	<120	0%	50%	NA

VOCs in Sed - Method: MS (A)(U)(V)AN-43-AN-124

Compound	Lab ID	Unit	Value	Limit	RPD	MSD	MSD%
Benzene	LB050635	mg/kg	0.1	<0.1	0%	78%	22%
	LB050636	mg/kg	0.1	<0.1	0%	78%	22%
	LB050637	mg/kg	0.1	<0.1	0%	100%	0%
Toluene	LB050635	mg/kg	0.1	<0.1	0%	92%	8%
	LB050636	mg/kg	0.1	<0.1	0%	97%	3%
	LB050637	mg/kg	0.1	<0.1	0%	85%	15%
Ethylbenzene	LB050635	mg/kg	0.1	<0.1	0%	73%	27%
	LB050636	mg/kg	0.1	<0.1	0%	73%	27%
	LB050637	mg/kg	0.1	<0.1	0%	75%	25%
m/p-xylene	LB050635	mg/kg	0.2	<0.2	0%	70%	30%
	LB050636	mg/kg	0.2	<0.2	0%	70%	30%
	LB050637	mg/kg	0.2	<0.2	0%	107%	7%
o-xylene	LB050635	mg/kg	0.1	<0.1	0%	68%	32%
	LB050636	mg/kg	0.1	<0.1	0%	60%	40%
	LB050637	mg/kg	0.1	<0.1	0%	81%	19%
Naphthalene	LB050635	mg/kg	0.1	<0.1	0%	NA	NA
	LB050636	mg/kg	0.1	<0.1	0%	NA	NA
	LB050637	mg/kg	0.1	<0.1	0%	NA	NA
Dibromofluoromethane (Surrogate)	LB050635	%	75%	1-8%	86%	102%	
	LB050636	%	75%	1-8%	80%	91%	
	LB050637	%	100%	12%	107%	5%	
m4-1,2-dichloroethane (Surrogate)	LB050635	%	77%	1-8%	80%	107%	
	LB050636	%	77%	1-8%	80%	95%	
	LB050637	%	103%	1%	107%	4%	

10/10/2014

QC SUMMARY

SE123726.D\\n

Retention times are compared to the following:  
 100% and 50% standards. The peak area of the sample is compared to the peak area of the standard at the same  
 concentration. The relative retention time (RRT) is calculated as the ratio of the sample retention time to the  
 standard retention time. Where RRT is not 1.00, the sample is not a match for the standard.

Retention Time (min)	Sample Concentration (%)	Standard Concentration (%)	Peak Area (Sample)	Peak Area (Standard)	RRT
1.123	100%	100%	12345	12345	1.00
1.123	50%	100%	6172.5	12345	1.00
1.123	100%	50%	12345	6172.5	1.00
1.123	50%	50%	6172.5	6172.5	1.00

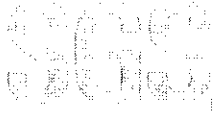
Retention Time (min)	Sample Concentration (%)	Standard Concentration (%)	Peak Area (Sample)	Peak Area (Standard)	RRT
1.123	100%	100%	12345	12345	1.00
1.123	50%	100%	6172.5	12345	1.00
1.123	100%	50%	12345	6172.5	1.00
1.123	50%	50%	6172.5	6172.5	1.00

Retention Time (min)	Sample Concentration (%)	Standard Concentration (%)	Peak Area (Sample)	Peak Area (Standard)	RRT
1.123	100%	100%	12345	12345	1.00
1.123	50%	100%	6172.5	12345	1.00
1.123	100%	50%	12345	6172.5	1.00
1.123	50%	50%	6172.5	6172.5	1.00

Retention Time (min)	Sample Concentration (%)	Standard Concentration (%)	Peak Area (Sample)	Peak Area (Standard)	RRT
1.123	100%	100%	12345	12345	1.00
1.123	50%	100%	6172.5	12345	1.00
1.123	100%	50%	12345	6172.5	1.00
1.123	50%	50%	6172.5	6172.5	1.00

Retention Time (min)	Sample Concentration (%)	Standard Concentration (%)	Peak Area (Sample)	Peak Area (Standard)	RRT
1.123	100%	100%	12345	12345	1.00
1.123	50%	100%	6172.5	12345	1.00
1.123	100%	50%	12345	6172.5	1.00
1.123	50%	50%	6172.5	6172.5	1.00





## METHOD SUMMARY

SE123728 R0

AN433/AN434/AN410

VOCs and C6-C9/C6-C10 Hydrocarbons by GC-MS P&T. VOC's are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260

IS	Insufficient sample for analysis	LOR	Limit of Reporting
LNR	Sample listed, but not received.	↑↓	Raised or Lowered Limit of Reporting
*	This analysis is not covered by the scope of accreditation.	QFH	QC result is above the upper tolerance
**	Indicative data, theoretical holding time exceeded	QFL	QC result is below the lower tolerance
^	Performed by outside laboratory.	.	The sample was not analysed for this analyte
		NVI	Not Validated

Samples analysed as received.

Solid samples expressed on a dry weight basis.

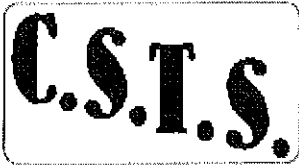
Some totals may not appear to add up because the total is rounded after adding up the raw values.

The QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: <http://www.sgs.com.au/pv.sgsv3/~!media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf>

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### **Appendix D**

#### **Curriculum Vitae**

# **Celia Moloney – Curriculum Vitae**

## **Tertiary Education**

Royal Melbourne Institute of Technology – Bachelor of Engineering (Environmental), 2005-2009

## **Professional Experience**

### **Compaction & Soil Testing Services Pty Ltd**

Environmental Consultant, AUG2012-Current

- Conducted Waste Classification Assessment for: WA Brown Building (Caltex - Ingleburn)  
Jeffsann Excavations (Bunning Warehouse – Wallsend), Ford Civil (Pitt St & Curtin Place - Sydney), Mainland Civil (Wollongong Hospital – Wollongong)
- Conducted Site Validation Assessment for : Mainland Civil (Habitat Apartments – Braddon)
- Contributed to Detailed Site Investigation for: All Star Real Estate (Beverly Hills)

**John Holland – Glenfield to Leppington Rail Line, Environment Coordinator, OCT2011-  
AUG2012**

**John Holland – Mardi to Mangrove, Environment Coordinator, AUG2010-OCT2011**

- Management of soil including waste tracking and disposal management.

**John Holland – Head Office, Environment and Quality Coordinator, JAN2010-AUG2010**

**John Holland – Sugarloaf Pipeline Alliance, Environment Student, DEC 2008-DEC2009**

# Craig Ridley - Curriculum Vitae

## Tertiary Education

University of Western Sydney, Hawkesbury - *Bachelor of Applied Science (Environmental Health)*,  
Feb 2007 – Apr 2013

Major: Environmental Health Management

## Professional Experience

### **Compaction & Soil Testing Services Pty Ltd**

Environmental Consultant, FEB 2011 - Current

Roles;

- Waste Classification Assessments
- Preliminary and Detailed Site Investigations
- Site Validation Assessments
- Acid Sulphate Soil Assessments
- Salinity Investigations

Major Projects;

- Great Western Highway Upgrade, Woodford to Hazelbrook NSW
- Tempo Apartments Development, Mascot NSW
- Centre for Obesity, Diabetes and Cardiovascular Disease, University of Sydney, Camperdown NSW
- Bunning's Warehouse, Wallsend NSW
- Habitat Apartments, Braddon ACT
- Wollongong Private Hospital NSW
- ERKO Apartments, Erskineville NSW
- Greenway, Marsden Park NSW

## APPENDIX C – PHOTO LOGS

**65 Dunheved Circuit, St Marys – ANTQIP diesel AST – 2017 & 2019**



**65 Dunheved Circuit, St Marys – ANTQIP drum storage - 2017**



**Dunheved Circuit, St Marys – Oily Residue ANTQIP - 2017**



**65 Dunheved Circuit – Jaybro storage yard looking south to sandstone supplies - 2017**



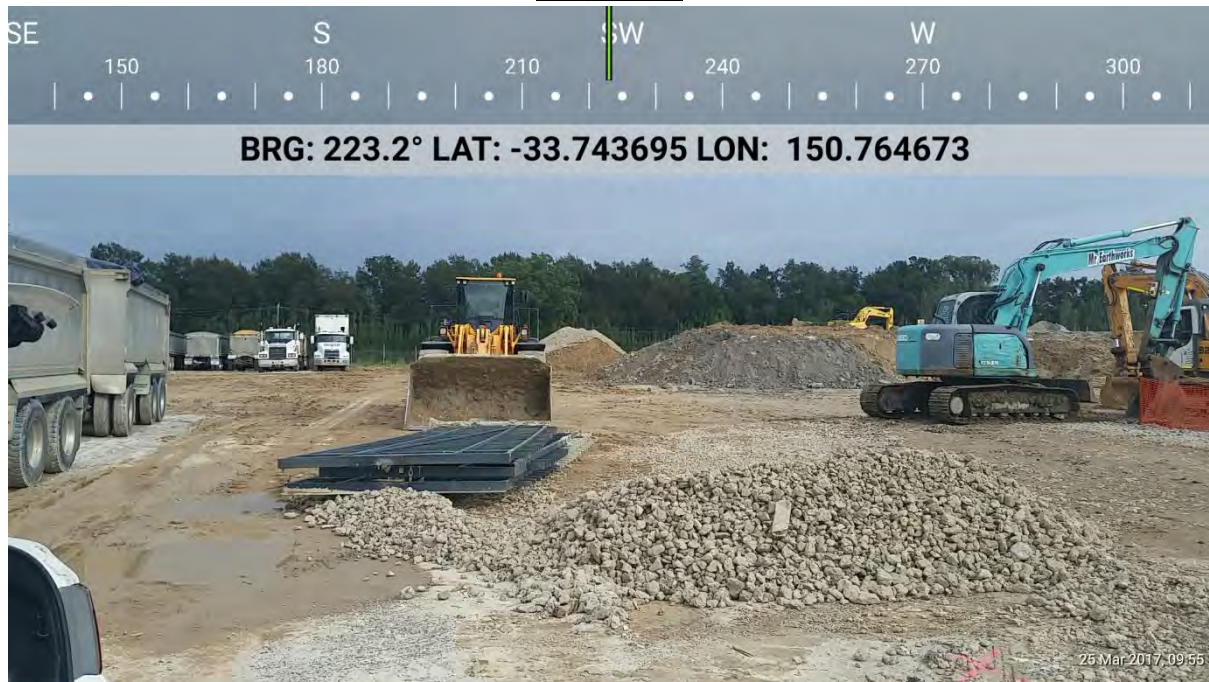
**65 Dunheved Circuit, St Marys – Jaybro concrete fabrication yard looking south - 2017**



**65 Dunheved Circuit, St Marys – RCA Trucks diesel AST and oil drum storage - 2017**



**65 Dunheved Circuit, St Marys – RCA Trucks parking (back left) and Sandstone Supplies (right hand side) - 2017**



**65 Dunheved Circuit, St Marys – RCA Trucks parking looking east towards Dunheved Circuit - 2017**



**65 Dunheved Circuit, St Marys – ANTQIP truck parking along southern site boundary- 2017**



**65 Dunheved Circuit, St Marys – TP01**



**65 Dunheved Circuit, St Marys – TP02**



**65 Dunheved Circuit, St Marys – TP03**



**65 Dunheved Circuit, St Marys – TP04**



**65 Dunheved Circuit, St Marys – TP05**



**65 Dunheved Circuit, St Marys – TP06**



**65 Dunheved Circuit, St Marys – TP06 Spoils – note surface staining**



**65 Dunheved Circuit, St Marys – TP08**



**65 Dunheved Circuit, St Marys – TP09**



**65 Dunheved Circuit, St Marys – TP10**



**65 Dunheved Circuit, St Marys – TP11**



**65 Dunheved Circuit, St Marys – TP12**



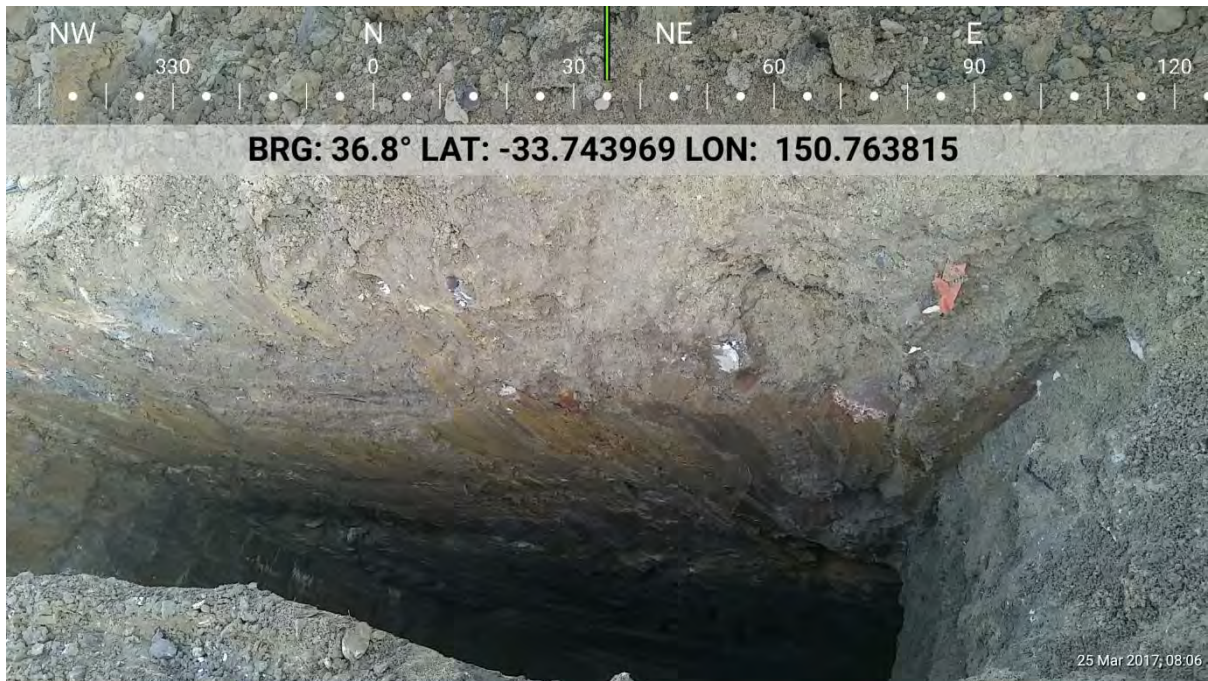
**65 Dunheved Circuit, St Marys – TP13**



**65 Dunheved Circuit, St Marys – TP14**



**65 Dunheved Circuit, St Marys – TP15**



**65 Dunheved Circuit, St Marys – TP16**



**65 Dunheved Circuit, St Marys – TP17**



**65 Dunheved Circuit, St Marys – TP18**



**65 Dunheved Circuit, St Marys – TP19**



**65 Dunheved Circuit, St Marys – Rembrandt Dutch Club - 2019**



**65 Dunheved Circuit, St Marys – Jaybro Yard - 2019**



**65 Dunheved Circuit, St Marys – Jaybro AST - 2019**



**65 Dunheved Circuit, St Marys – Jaybro Yard looking towards Dunheved Circuit - 2019**



**65 Dunheved Circuit, St Marys – Ventia Yard – 2019 (no access available)**



## APPENDIX D – LABORATORY CERTIFICATES OF ANALYSIS



# CHAIN OF CUSTODY DOCUMENTATION



**CLIENT:** DRC Environmental Pty Ltd  
**ADDRESS / OFFICE:** G6 / 79-109 Manningham Road, Bulleah VIC 3105  
**PROJECT MANAGER (PM):** Patrick Baldwin  
**PROJECT ID:**  
**SITE:** P.O. NO:  
**RESULTS REQUIRED (Date):** QUOTE NO.:  
**SAMPLER:**  
**MOBILE:**  
**PHONE:**  
**EMAIL REPORT TO:** patrick@drcenviro.com.au poppy@drcenviro.com.au  
**EMAIL INVOICE TO:** (if different to report)

**ANALYSIS REQUIRED including SUITES** (note - suite codes must be listed to attract suite prices)

**FOR LABORATORY USE ONLY**  
**COOLER SEAL** (circle appropriate)  
 Intact: Yes No N/A  
**SAMPLE TEMPERATURE**  
 CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL			

Notes: e.g. Highly contaminated samples e.g. "High PAHs expected".  
Extra volume for QC or trace LORs etc.

SAMPLE INFORMATION (note: S = Soil, W=Water)					CONTAINER INFORMATION		R-12	R-16	R-17	ASSAYS NEAM	HOLD
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles					
	TP06-0.1	S	24/3		J, Asb, Bag		-				
	TP06-0.6				J						
	TP07-0.1				J, Asb, Bag						
	TP07-0.6				J						
	TP08-0.1				J, Asb, Bag						
	TP08-0.5				J						X
	TP08-1.5				J						
	TP08-3.9				J						
	TP09-0.1				J, Asb, Bag						
	TP09-2.5				J						
	TP10-0.1				J, Asb, Bag						
	TP10-2.8	V	V		J						X

RELINQUISHED BY:		RECEIVED BY:		METHOD OF SHIPMENT
Name:	Date:	Name: <i>SB</i>	Date: 27/3	Con' Note No:
Of:	Time:	Of: <i>EURGENS</i>	Time: 11:20AM	Transport Co:
Name:	Date:	Name:	Date:	
Of:	Time:	Of:	Time:	

**Water Container Codes:** P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved,  
 V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulphuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulphuric Preserved Plastic; F = Formaldehyde Preserved Glass;  
 Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

# CHAIN OF CUSTODY DOCUMENTATION



**DRC ENVIRONMENTAL**  
Development Remediation & Compliance  
DRC Environmental Pty Ltd

CLIENT: DRC Environmental Pty Ltd

SAMPLER:

ADDRESS / OFFICE: G6 / 79-109 Manningham Road, Bulleen VIC 3105

MOBILE:

PROJECT MANAGER (PM): Patrick Baldwin

PHONE:

PROJECT ID:

EMAIL REPORT TO: [patrick@drcenviro.com.au](mailto:patrick@drcenviro.com.au) [poppo@drcenviro.com.au](mailto:poppo@drcenviro.com.au)

SITE: P.O. NO.:

EMAIL INVOICE TO: (if different to report)

RESULTS REQUIRED (Date): QUOTE NO.:

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

**FOR LABORATORY USE ONLY**

COOLER SEAL (circle appropriate)

Intact: Yes No N/A

SAMPLE TEMPERATURE

CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL

R12	R16	R17	NEAR ASBESTOS																	HOLD
-----	-----	-----	---------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	------

Notes: e.g. Highly contaminated samples  
e.g. "High PAHs expected".  
Extra volume for QC or trace LORs etc.

SAMPLE INFORMATION (note: S = Soil, W = Water) CONTAINER INFORMATION

ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles
	SS01	S	24/3		J	
	TP11-0.2				J, ASB	
	TP11-0.7				J	
	TP11-2.9				J	
	TP12-0.1				J, ASB	
	TP12-2.2				J	
	TP12-3.2				J	
	TP13-0.1				J, ASB	
	TP13-1.2				J	
	TP13-2.9				J	
	TP14-0.2				J, ASB	
	TP14-1.4				J	

0.1% - CONTAMINATED

RELINQUISHED BY:

RECEIVED BY:

METHOD OF SHIPMENT

Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Of: \_\_\_\_\_ Time: \_\_\_\_\_  
 Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Of: \_\_\_\_\_ Time: \_\_\_\_\_

Name: *OH* \_\_\_\_\_ Date: *27/3* \_\_\_\_\_  
 Of: *George* \_\_\_\_\_ Time: *11:20am* \_\_\_\_\_  
 Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Of: \_\_\_\_\_ Time: \_\_\_\_\_

Con' Note No: \_\_\_\_\_  
 Transport Co: \_\_\_\_\_

**Water Container Codes:** P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved,  
 V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass,  
 Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

# CHAIN OF CUSTODY DOCUMENTATION



**DRC ENVIRONMENTAL**  
Environmental & Process Services Pty Ltd  
**DRC Environmental Pty Ltd**

CLIENT: DRC Environmental Pty Ltd

SAMPLER: *P. Prochaska*

ADDRESS / OFFICE: G6 / 79-109 Manningham Road, Bulleen VIC 3105

MOBILE: *04-90659492*

PROJECT MANAGER (PM): Patrick Baldwin

PHONE:

PROJECT ID: *St Marys*

EMAIL REPORT TO: *patrick@drcenviro.com.au*

SITE:

EMAIL INVOICE TO: (if different to report) *rease@drcenviro.com.au*

RESULTS REQUIRED (Date): *Standard TR* QUOTE NO.:

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

**FOR LABORATORY USE ONLY**  
 COOLER SEAL (circle appropriate)  
 Intact: Yes No N/A  
 SAMPLE TEMPERATURE  
 CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	R12	R16	R17	Asbestos NORM	TPH Co-Ca	HO-D
	TP14-2a	S	24/3		J							X
	TB01	N	24/3		2x vials							
	TB02	N	24/3		2x vials							
	TP15-01	S	25/3		J + Asb.	1						
	TP15-20				J							
	TP15-3.5				J							
	TP16-0.2				J + Asb							
	TP16-1.0				J							
	TP16-3.0				J							X
	TP17-0.2				J + Asb							
	TP17-1.5				J							X
	TP17-3.5				J							

Notes: e.g. Highly contaminated samples  
 e.g. "High PAHs expected".  
 Extra volume for QC or trace LORs etc.

SAMPLE INFORMATION (note: S = Soil, W = Water)

SAMPLE INFORMATION (note: S = Soil, W = Water)				CONTAINER INFORMATION		
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles
	TP14-2a	S	24/3		J	
	TB01	N	24/3		2x vials	
	TB02	N	24/3		2x vials	
	TP15-01	S	25/3		J + Asb.	1
	TP15-20				J	
	TP15-3.5				J	
	TP16-0.2				J + Asb	
	TP16-1.0				J	
	TP16-3.0				J	
	TP17-0.2				J + Asb	
	TP17-1.5				J	
	TP17-3.5				J	

RELINQUISHED BY:  
 Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Of: \_\_\_\_\_ Time: \_\_\_\_\_  
 Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Of: \_\_\_\_\_ Time: \_\_\_\_\_

RECEIVED BY:  
 Name: *AD* Date: *27/3*  
 Of: *Geology* Time: *11:20am*  
 Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Of: \_\_\_\_\_ Time: \_\_\_\_\_

METHOD OF SHIPMENT  
 Con' Note No: \_\_\_\_\_  
 Transport Co: \_\_\_\_\_

**Water Container Codes:** P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Co Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved;  
 V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulphuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulphuric Preserved Plastic; F = Formaldehyde Preserved Glass.  
 Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

# CHAIN OF CUSTODY DOCUMENTATION



**DRC ENVIRONMENTAL**  
Developers of Environmental Compliance  
**DRC Environmental Pty Ltd**

CLIENT: DRC Environmental Pty Ltd

SAMPLER:

ADDRESS / OFFICE: G6 / 79-109 Manningham Road, Bulleen VIC 3105

MOBILE:

PROJECT MANAGER (PM): Patrick Baldwin

PHONE:

PROJECT ID:

EMAIL REPORT TO: patrick@drcenviro.com.au poppy@drcenviro.com.au

SITE: P.O. NO.:

EMAIL INVOICE TO: (if different to report)

RESULTS REQUIRED (Date): QUOTE NO.:

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

**FOR LABORATORY USE ONLY**

**COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:**

COOLER SEAL (circle appropriate)

Intact: Yes No N/A

**SAMPLE TEMPERATURE**

CHILLED: Yes No

Notes: e.g. Highly contaminated samples  
 e.g. "High PAHs expected".  
 Extra volume for QC or trace LORs etc.

R12  
 R16  
 R17  
 Asbestos HBM  
 TRHC-CM

Hand

**SAMPLE INFORMATION (note: S = Soil, W=Water)**

**CONTAINER INFORMATION**

ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles
	TP18-0.2	S	25/3		J+Asb.	
	TP18-2.5				J#	
	QC01-250317				J+Asb	
	QC02-250317				J+Asb	
	QC03-250317				J	
	QC04-250317				J	
	TP19-0.2				J	
	TP19-3.5				J	
	TB03-250317	W			2x vials	
	TB04-250317	W			2x vials	
	TP19				Asb.	

Please fwd to ALS

Please fwd to ALS

**RELINQUISHED BY:**

**RECEIVED BY:**

**METHOD OF SHIPMENT**

Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Of: \_\_\_\_\_ Time: \_\_\_\_\_  
 Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Of: \_\_\_\_\_ Time: \_\_\_\_\_

Name: *AB* Date: 27/3  
 Of: *Alcoa* Time: 11:20 AM  
 Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Of: \_\_\_\_\_ Time: \_\_\_\_\_

Con' Note No: \_\_\_\_\_  
 Transport Co: \_\_\_\_\_

**Water Container Codes:** P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved,  
 V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulphuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulphuric Preserved Plastic; F = Formaldehyde Preserved Glass;  
 Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bad for Acid Sulphate Soils; B = Unpreserved Bag.

**Rupan Virk**

*Rupan 28/3*

**From:** Renee Prochazka <renee@drcenviro.com.au>  
**Sent:** Tuesday, 28 March 2017 2:48 PM  
**To:** Rupan Virk  
**Subject:** RE: Eurofins | mgt Sample Receipt Advice - Report 539755 : Site DUNHEVED CIRCUIT (ST MARYS)

*14:48.*

Ah,  
I see. Please do the asbestos absence/presence analysis if not enough sample was provided. As for Foreign Materials – please change the analysis to no-FM where sample volume is not enough.

Regards  
Renee

---

**From:** [RupanVirk@eurofins.com](mailto:RupanVirk@eurofins.com) [mailto:[RupanVirk@eurofins.com](mailto:RupanVirk@eurofins.com)]  
**Sent:** Tuesday, 28 March 2017 2:31 PM  
**To:** Renee Prochazka <[renee@drcenviro.com.au](mailto:renee@drcenviro.com.au)>; [EnviroSampleNSW@eurofins.com](mailto:EnviroSampleNSW@eurofins.com)  
**Subject:** RE: Eurofins | mgt Sample Receipt Advice - Report 539755 : Site DUNHEVED CIRCUIT (ST MARYS)

Hi Renee

As per COC analysis asked for asbestos is Asbestos-WA analysis which requires approx. 500ml of sample (i.e. 700-800 gms) for which zip-lock bags were used, whereas for Foreign Materials about 4-6 kgs of sample is required. Small Asbestos bags can just be used for Asbestos Absence/Presence analysis. Please provide further instructions.  
Thanks

Rupan Virk  
Sample Receipt | NSW

Phone : +61 2 9900 8400

Email : [RupanVirk@eurofins.com](mailto:RupanVirk@eurofins.com)

---

**From:** Renee Prochazka [mailto:[renee@drcenviro.com.au](mailto:renee@drcenviro.com.au)]  
**Sent:** Tuesday, 28 March 2017 7:54 AM  
**To:** !AU04\_CAU001\_EnviroSampleNSW  
**Subject:** RE: Eurofins | mgt Sample Receipt Advice - Report 539755 : Site DUNHEVED CIRCUIT (ST MARYS)

There should have been asbestos (small) bags provided for all those samples listed.  
As for FM bags, I just used zip lock bags for that analysis.... They should have been double bagged in the esky.

Regards  
Renee

---

**From:** [envirosamplensw@eurofins.com](mailto:envirosamplensw@eurofins.com) [mailto:[envirosamplensw@eurofins.com](mailto:envirosamplensw@eurofins.com)]  
**Sent:** Monday, 27 March 2017 8:38 PM  
**To:** Patrick Baldwin <[patrick@drcenviro.com.au](mailto:patrick@drcenviro.com.au)>  
**Cc:** Renee Prochazka <[renee@drcenviro.com.au](mailto:renee@drcenviro.com.au)>  
**Subject:** Eurofins | mgt Sample Receipt Advice - Report 539755 : Site DUNHEVED CIRCUIT (ST MARYS)

## Alena Bounkeua

---

**To:** Mary Makarios  
**Subject:** RE: Eurofins | mgt Sample Receipt Advice - Report 539755 : Site DUNHEVED CIRCUIT (ST MARYS)

---

**From:** Mary Makarios  
**Sent:** Thursday, 30 March 2017 11:38 AM  
**To:** Charl Du Preez; Alena Bounkeua  
**Cc:** Rupan Virk  
**Subject:** RE: Eurofins | mgt Sample Receipt Advice - Report 539755 : Site DUNHEVED CIRCUIT (ST MARYS)

Anyway I spoke with the client and she said to remove the FM if we cannot do it and just do the R17 instead if she requested R16.thanks

Mary Makarios  
Phone : +61 3 8564 5088  
Email : [MaryMakarios@eurofins.com](mailto:MaryMakarios@eurofins.com)

---

**From:** Alena Bounkeua  
**Sent:** Thursday, 30 March 2017 11:12 AM  
**To:** Mary Makarios  
**Cc:** Charl Du Preez; Rupan Virk  
**Subject:** RE: Eurofins | mgt Sample Receipt Advice - Report 539755 : Site DUNHEVED CIRCUIT (ST MARYS)

Hi Mary,

How are we going about this job with foreign materials as only small bags were received.

Thanks

Alena Bounkeua  
**Sample Receipt | NSW**

Phone : +61 2 9900 8400

Email : [AlenaBounkeua@eurofins.com](mailto:AlenaBounkeua@eurofins.com)

---

**From:** Charl Du Preez  
**Sent:** Tuesday, 28 March 2017 11:01 AM  
**To:** Alena Bounkeua  
**Cc:** Mary Makarios  
**Subject:** FW: Eurofins | mgt Sample Receipt Advice - Report 539755 : Site DUNHEVED CIRCUIT (ST MARYS)

Can you please sort in collaboration with Mary?

Charl DuPreez  
Phone : +61 2 9900 8460  
Email : [CharlDuPreez@eurofins.com](mailto:CharlDuPreez@eurofins.com)

---

**From:** Renee Prochazka [<mailto:renee@drcenviro.com.au>]  
**Sent:** Tuesday, March 28, 2017 7:54 AM  
**To:** !AU04\_CAU001\_EnviroSampleNSW  
**Subject:** RE: Eurofins | mgt Sample Receipt Advice - Report 539755 : Site DUNHEVED CIRCUIT (ST MARYS)

There should have been asbestos (small) bags provided for all those samples listed.  
As for FM bags, I just used zip lock bags for that analysis.... They should have been double bagged in the esky.

Regards  
Renee

**From:** [envirosamplensw@eurofins.com](mailto:envirosamplensw@eurofins.com) [<mailto:envirosamplensw@eurofins.com>]  
**Sent:** Monday, 27 March 2017 8:38 PM  
**To:** Patrick Baldwin <[patrick@drcenviro.com.au](mailto:patrick@drcenviro.com.au)>  
**Cc:** Renee Prochazka <[renee@drcenviro.com.au](mailto:renee@drcenviro.com.au)>  
**Subject:** Eurofins | mgt Sample Receipt Advice - Report 539755 : Site DUNHEVED CIRCUIT (ST MARYS)

No Foreign Material Bags Provided hence analysis changed to R17. No asbestos WA bags(500ml) provided for TP11\_0.2, TP12\_0.1, TP13\_0.1, TP15\_0.1, TP16\_0.2, TP17\_0.2, TP18\_0.2, QC01\_250317, TP19 hence WA analysis cancelled. TB02\_250317 not received hence analysis cancelled. Sample TP11\_2.9 received as broken jar, cannot be salvaged, hence cancelled.

Dear Valued Client,

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 | mgt Analytical Services Manager as soon as possible to make certain that they get changed.

Regards

Rupar Virk  
**Sample Receipt**

**Eurofins | mgt**  
Unit F3, Parkview Building  
16 Mars Road  
LANE COVE WEST NSW 2066  
AUSTRALIA  
Phone: +61 299 008 400  
Email: [EnviroSampleNSW@eurofins.com](mailto:EnviroSampleNSW@eurofins.com)  
Website: [environment.eurofins.com.au](http://environment.eurofins.com.au)  
[EnviroNote 1068 - Eurofins Perth Laboratory](#)  
[EnviroNote 1069 - Eurofins Overnight TAT](#)

[EnviroNote 1071 - QSM 5.1](#)

[EnviroNote 1069 - Eurofins Overnight TAT](#)

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## Sample Receipt Advice

Company name: **DRC Environmental Pty Ltd**  
Contact name: **Patrick Baldwin**  
Project name: **DUNHEVED CIRCUIT**  
Project ID: **ST MARYS**  
COC number: **Not provided**  
Turn around time: **5 Day**  
Date/Time received: **Mar 27, 2017 11:20 AM**  
Eurofins | mgt reference: **539755**

### 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.
- Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

### Notes

**No Foreign Material Bags Provided hence analysis changed to R17. TB02\_250317 not received hence analysis cancelled. Sample TP11\_2.9 received as broken jar, cannot be salvaged, hence cancelled.**

### Contact notes

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

Mary Makarios on Phone : +61 3 8564 5000 or by e.mail: [MaryMakarios@eurofins.com](mailto:MaryMakarios@eurofins.com)

Results will be delivered electronically via e.mail to Patrick Baldwin - [patrick@drcenviro.com.au](mailto:patrick@drcenviro.com.au).

*Note: A copy of these results will also be delivered to the general DRC Environmental Pty Ltd email address.*

**Company Name:** DRC Environmental Pty Ltd  
**Address:** Suite G6/79-109 Manningham Rd  
Bulleen  
VIC 3105  
**Project Name:** DUNHEVED CIRCUIT  
**Project ID:** ST MARYS

**Order No.:**  
**Report #:** 539755  
**Phone:** 0402 455 638  
**Fax:**

**Received:** Mar 27, 2017 11:20 AM  
**Due:** Apr 3, 2017  
**Priority:** 5 Day  
**Contact Name:** Patrick Baldwin

**Eurofins | mgt Analytical Services Manager : Mary Makarios**

Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	Moisture Set	ENM Exemption Suite -The excavated natural material order 2014 NSW	NSW DECC - Waste Classification Table 1	BTEX and Volatile TRH
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>													X	
<b>Sydney Laboratory - NATA Site # 18217</b>						X	X	X	X	X	X	X	X	X
<b>Brisbane Laboratory - NATA Site # 20794</b>														
<b>Perth Laboratory - NATA Site # 18217</b>														
<b>External Laboratory</b>														
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID									
1	TP01_0.1	Mar 24, 2017		Soil	S17-Ma29521		X				X	X		
2	TP01_0.7	Mar 24, 2017		Soil	S17-Ma29522						X	X		
3	TP01_1.6	Mar 24, 2017		Soil	S17-Ma29523					X				
4	TP02_0.05	Mar 24, 2017		Soil	S17-Ma29524	X					X		X	
5	TP02_1.2	Mar 24, 2017		Soil	S17-Ma29527						X	X		
6	TP03_0.1	Mar 24, 2017		Soil	S17-Ma29528		X				X	X		
7	TP03_1.0	Mar 24, 2017		Soil	S17-Ma29529					X				
8	TP03_1.2	Mar 24, 2017		Soil	S17-Ma29530						X	X		
9	TP04_0.6	Mar 24, 2017		Soil	S17-Ma29531						X	X		

**Company Name:** DRC Environmental Pty Ltd  
**Address:** Suite G6/79-109 Manningham Rd  
Bulleen  
VIC 3105  
**Project Name:** DUNHEVED CIRCUIT  
**Project ID:** ST MARYS

**Order No.:**  
**Report #:** 539755  
**Phone:** 0402 455 638  
**Fax:**

**Received:** Mar 27, 2017 11:20 AM  
**Due:** Apr 3, 2017  
**Priority:** 5 Day  
**Contact Name:** Patrick Baldwin

**Eurofins | mgt Analytical Services Manager : Mary Makarios**

Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	Moisture Set	ENM Exemption Suite -The excavated natural material order 2014 NSW	NSW DECC - Waste Classification Table 1	BTEX and Volatile TRH
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>													X	
<b>Sydney Laboratory - NATA Site # 18217</b>						X	X	X	X	X	X	X	X	X
<b>Brisbane Laboratory - NATA Site # 20794</b>														
<b>Perth Laboratory - NATA Site # 18217</b>														
10	TP05_0.1	Mar 24, 2017		Soil	S17-Ma29532	X					X	X		
11	TP05_0.2	Mar 24, 2017		Soil	S17-Ma29533					X				
12	TP05_0.6	Mar 24, 2017		Soil	S17-Ma29534						X	X		
13	TP06_0.1	Mar 24, 2017		Soil	S17-Ma29535	X					X		X	
14	TP06_0.6	Mar 24, 2017		Soil	S17-Ma29536						X	X		
15	TP07_0.1	Mar 24, 2017		Soil	S17-Ma29537	X					X	X		
16	TP07_0.6	Mar 24, 2017		Soil	S17-Ma29538						X	X		
17	TP08_0.1	Mar 24, 2017		Soil	S17-Ma29539		X				X	X		
18	TP08_0.5	Mar 24, 2017		Soil	S17-Ma29540					X				
19	TP08_1.5	Mar 24, 2017		Soil	S17-Ma29541						X	X		
20	TP08_3.9	Mar 24, 2017		Soil	S17-Ma29542						X	X		
21	TP09_0.1	Mar 24, 2017		Soil	S17-Ma29543	X					X	X		

**Company Name:** DRC Environmental Pty Ltd  
**Address:** Suite G6/79-109 Manningham Rd  
Bulleen  
VIC 3105  
**Project Name:** DUNHEVED CIRCUIT  
**Project ID:** ST MARYS

**Order No.:**  
**Report #:** 539755  
**Phone:** 0402 455 638  
**Fax:**

**Received:** Mar 27, 2017 11:20 AM  
**Due:** Apr 3, 2017  
**Priority:** 5 Day  
**Contact Name:** Patrick Baldwin

**Eurofins | mgt Analytical Services Manager : Mary Makarios**

Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	Moisture Set	ENM Exemption Suite -The excavated natural material order 2014 NSW	NSW DECC - Waste Classification Table 1	BTEX and Volatile TRH
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>													X	
<b>Sydney Laboratory - NATA Site # 18217</b>						X	X	X	X	X	X	X	X	X
<b>Brisbane Laboratory - NATA Site # 20794</b>														
<b>Perth Laboratory - NATA Site # 18217</b>														
22	TP09_2.5	Mar 24, 2017		Soil	S17-Ma29544						X	X		
23	TP10_0.1	Mar 24, 2017		Soil	S17-Ma29545						X	X		
24	TP10_2.8	Mar 24, 2017		Soil	S17-Ma29546					X				
25	SS01	Mar 24, 2017		Soil	S17-Ma29547						X	X		
26	TP11_0.2	Mar 24, 2017		Soil	S17-Ma29548			X			X	X		
27	TP11_0.7	Mar 24, 2017		Soil	S17-Ma29549						X	X		
28	TP11_2.9	Mar 24, 2017		Soil	S17-Ma29550				X					
29	TP12_0.1	Mar 24, 2017		Soil	S17-Ma29551			X			X		X	
30	TP12_2.2	Mar 24, 2017		Soil	S17-Ma29552						X	X		
31	TP12_3.2	Mar 24, 2017		Soil	S17-Ma29553					X				
32	TP13_0.1	Mar 24, 2017		Soil	S17-Ma29554			X			X	X		
33	TP13_1.2	Mar 24, 2017		Soil	S17-Ma29555						X	X		

**Company Name:** DRC Environmental Pty Ltd  
**Address:** Suite G6/79-109 Manningham Rd  
Bulleen  
VIC 3105  
**Project Name:** DUNHEVED CIRCUIT  
**Project ID:** ST MARYS

**Order No.:**  
**Report #:** 539755  
**Phone:** 0402 455 638  
**Fax:**

**Received:** Mar 27, 2017 11:20 AM  
**Due:** Apr 3, 2017  
**Priority:** 5 Day  
**Contact Name:** Patrick Baldwin

**Eurofins | mgt Analytical Services Manager : Mary Makarios**

Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	Moisture Set	ENM Exemption Suite -The excavated natural material order 2014 NSW	NSW DECC - Waste Classification Table 1	BTEX and Volatile TRH
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>													X	
<b>Sydney Laboratory - NATA Site # 18217</b>						X	X	X	X	X	X	X	X	X
<b>Brisbane Laboratory - NATA Site # 20794</b>														
<b>Perth Laboratory - NATA Site # 18217</b>														
34	TP13_2.9	Mar 24, 2017		Soil	S17-Ma29556					X				
35	TP14_0.2	Mar 24, 2017		Soil	S17-Ma29557	X					X	X		
36	TP14_1.4	Mar 24, 2017		Soil	S17-Ma29558						X	X		
37	TP14_2.9	Mar 24, 2017		Soil	S17-Ma29559					X				
38	TB01	Mar 24, 2017		Water	S17-Ma29560									X
39	TP15_0.1	Mar 25, 2017		Soil	S17-Ma29562			X			X		X	
40	TP15_2.0	Mar 25, 2017		Soil	S17-Ma29563						X	X		
41	TP15_3.5	Mar 25, 2017		Soil	S17-Ma29564						X	X		
42	TP16_0.2	Mar 25, 2017		Soil	S17-Ma29565			X			X	X		
43	TP16_1.0	Mar 25, 2017		Soil	S17-Ma29566						X	X		
44	TP17_0.2	Mar 25, 2017		Soil	S17-Ma29567			X			X	X		
45	TP17_1.5	Mar 25, 2017		Soil	S17-Ma29568					X				

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<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>													X	
<b>Sydney Laboratory - NATA Site # 18217</b>						X	X	X	X	X	X	X	X	X
<b>Brisbane Laboratory - NATA Site # 20794</b>														
<b>Perth Laboratory - NATA Site # 18217</b>														
46	TP17_3.5	Mar 25, 2017		Soil	S17-Ma29569						X	X		
47	TP16_3.0	Mar 25, 2017		Soil	S17-Ma29570					X				
48	TP18_0.2	Mar 25, 2017		Soil	S17-Ma29571			X			X	X		
49	TP18_2.5	Mar 25, 2017		Soil	S17-Ma29572						X	X		
50	QC01_250317	Mar 25, 2017		Soil	S17-Ma29573			X			X	X		
51	QC03_250317	Mar 25, 2017		Soil	S17-Ma29574						X	X		
52	TP19_0.2	Mar 25, 2017		Soil	S17-Ma29575						X	X		
53	TP19_3.5	Mar 25, 2017		Soil	S17-Ma29576						X	X		
54	TB03_250317	Mar 25, 2017		Water	S17-Ma29577									X
55	TB04_250317	Mar 25, 2017		Water	S17-Ma29578									X
56	TP19	Mar 25, 2017		Other	S17-Ma29579			X						
<b>Test Counts</b>						6	3	9	1	10	41	37	4	3

# Certificate of Analysis



**NATA Accredited**  
**Accreditation Number 1261**  
**Site Number 18217**

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.

**DRC Environmental Pty Ltd**  
**Suite G6/79-109 Manningham Rd**  
**Bulleen**  
**VIC 3105**

**Attention:** Patrick Baldwin  
**Report** 539755-AID  
**Project Name** DUNHEVED CIRCUIT  
**Project ID** ST MARYS  
**Received Date** Mar 27, 2017  
**Date Reported** Apr 04, 2017

## Methodology:

**Asbestos ID** Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. Bulk samples include building materials, soils and ores.

**Subsampling Soil Samples** The whole sample submitted is first dried and then sieved through a 10mm sieve followed by a 2mm sieve. All fibrous matter viz greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) Iron ores - Sampling and Sample preparation procedures is employed. Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis in accordance with AS 4964-2004.

**Bonded asbestos-containing material (ACM)** The material is first examined and any fibres isolated and where required interfering organic fibres or matter may be removed by treating the sample for several hours at a temperature not exceeding  $400 \pm 30^{\circ}\text{C}$ . The resultant material is then ground and examined in accordance with AS 4964-2004.

**Limit of Reporting** The nominal detection limit of the AS4964 method is around 0.01%. The examination of large sample sizes (at least 500 ml is recommended) may improve the likelihood of identifying asbestos material in the greater than 2 mm fraction. The NEPM screening level of 0.001% w/w asbestos in soil for FA and AF (i.e. non-bonded/friable asbestos) only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. NOTE: NATA News, September 2011 – page 34, states, “Weighing of fibres is problematic and can lead to loss of fibres and potential exposure for laboratory analysts. To request laboratories to report information which is outside the scope of AS 4964-2004 and the scope of their accreditation is misleading and is most unwise” therefore such values reported are outside the scope of Eurofins | mgt NATA accreditation as designated by an asterisk.

**Project Name** DUNHEVED CIRCUIT  
**Project ID** ST MARYS  
**Date Sampled** Mar 24, 2017 to Mar 25, 2017  
**Report** 539755-AID

Client Sample ID	Eurofins   mgt Sample No.	Date Sampled	Sample Description	Result
TP01_0.1	17-Ma29521	Mar 24, 2017	Approximate Sample 299g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected. <sup>M11</sup>
TP02_0.05	17-Ma29524	Mar 24, 2017	Approximate Sample 246g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w.* Organic fibre detected. No respirable fibres detected.
TP03_0.1	17-Ma29528	Mar 24, 2017	Approximate Sample 261g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected. <sup>M11</sup>
TP05_0.1	17-Ma29532	Mar 24, 2017	Approximate Sample 242g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w.* Organic fibre detected. No respirable fibres detected.
TP06_0.1	17-Ma29535	Mar 24, 2017	Approximate Sample 234g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w.* Organic fibre detected. No respirable fibres detected.
TP07_0.1	17-Ma29537	Mar 24, 2017	Approximate Sample 212g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w.* Organic fibre detected. No respirable fibres detected.
TP08_0.1	17-Ma29539	Mar 24, 2017	Approximate Sample 303g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected. <sup>M11</sup>
TP09_0.1	17-Ma29543	Mar 24, 2017	Approximate Sample 180g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w.* Organic fibre detected. No respirable fibres detected.
TP11_0.2	17-Ma29548	Mar 24, 2017	Approximate Sample 217g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
TP12_0.1	17-Ma29551	Mar 24, 2017	Approximate Sample 220g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.

Client Sample ID	Eurofins   mgt Sample No.	Date Sampled	Sample Description	Result
TP13_0.1	17-Ma29554	Mar 24, 2017	Approximate Sample 179g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
TP14_0.2	17-Ma29557	Mar 24, 2017	Approximate Sample 219g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w.* Organic fibre detected. No respirable fibres detected.
TP15_0.1	17-Ma29562	Mar 25, 2017	Approximate Sample 244g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
TP16_0.2	17-Ma29565	Mar 25, 2017	Approximate Sample 210g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
TP17_0.2	17-Ma29567	Mar 25, 2017	Approximate Sample 58/ 80x40x4mm Sample consisted of: Grey compressed cement material	No asbestos detected.
TP18_0.2	17-Ma29571	Mar 25, 2017	Approximate Sample 265g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
QC01_250317	17-Ma29573	Mar 25, 2017	Approximate Sample 228g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
TP19	17-Ma29579	Mar 25, 2017	Approximate Sample 53g / 70x65x3mm Sample consisted of: Grey compressed fibre cement material	Chrysotile asbestos detected. Organic fibre detected.

### 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 (regarding both quality and NATA accreditation).

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
Asbestos - LTM-ASB-8020	Sydney	Apr 03, 2017	Indefinite
Asbestos - LTM-ASB-8020	Sydney	Apr 03, 2017	Indefinite
Asbestos - LTM-ASB-8020	Sydney	Apr 03, 2017	Indefinite

<b>Company Name:</b> DRC Environmental Pty Ltd	<b>Order No.:</b>	<b>Received:</b> Mar 27, 2017 11:20 AM
<b>Address:</b> Suite G6/79-109 Manningham Rd Bulleen VIC 3105	<b>Report #:</b> 539755	<b>Due:</b> Apr 3, 2017
<b>Project Name:</b> DUNHEVED CIRCUIT	<b>Phone:</b> 0402 455 638	<b>Priority:</b> 5 Day
<b>Project ID:</b> ST MARYS	<b>Fax:</b>	<b>Contact Name:</b> Patrick Baldwin

**Eurofins | mgt Analytical Services Manager : Mary Makarios**

Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	Moisture Set	ENM Exemption Suite -The excavated natural material order 2014 NSW	NSW DECC - Waste Classification Table 1	BTEX and Volatile TRH
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>													X	
<b>Sydney Laboratory - NATA Site # 18217</b>						X	X	X	X	X	X	X	X	X
<b>Brisbane Laboratory - NATA Site # 20794</b>														
<b>Perth Laboratory - NATA Site # 18217</b>														
<b>External Laboratory</b>														
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID									
1	TP01_0.1	Mar 24, 2017		Soil	S17-Ma29521		X				X	X		
2	TP01_0.7	Mar 24, 2017		Soil	S17-Ma29522						X	X		
3	TP01_1.6	Mar 24, 2017		Soil	S17-Ma29523					X				
4	TP02_0.05	Mar 24, 2017		Soil	S17-Ma29524	X					X		X	
5	TP02_1.2	Mar 24, 2017		Soil	S17-Ma29527						X	X		
6	TP03_0.1	Mar 24, 2017		Soil	S17-Ma29528		X				X	X		
7	TP03_1.0	Mar 24, 2017		Soil	S17-Ma29529					X				
8	TP03_1.2	Mar 24, 2017		Soil	S17-Ma29530						X	X		
9	TP04_0.6	Mar 24, 2017		Soil	S17-Ma29531						X	X		

<b>Company Name:</b> DRC Environmental Pty Ltd	<b>Order No.:</b>	<b>Received:</b> Mar 27, 2017 11:20 AM
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**Eurofins | mgt Analytical Services Manager : Mary Makarios**

Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	Moisture Set	ENM Exemption Suite -The excavated natural material order 2014 NSW	NSW DECC - Waste Classification Table 1	BTEX and Volatile TRH
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>													X	
<b>Sydney Laboratory - NATA Site # 18217</b>						X	X	X	X	X	X	X	X	X
<b>Brisbane Laboratory - NATA Site # 20794</b>														
<b>Perth Laboratory - NATA Site # 18217</b>														
10	TP05_0.1	Mar 24, 2017		Soil	S17-Ma29532	X					X	X		
11	TP05_0.2	Mar 24, 2017		Soil	S17-Ma29533					X				
12	TP05_0.6	Mar 24, 2017		Soil	S17-Ma29534						X	X		
13	TP06_0.1	Mar 24, 2017		Soil	S17-Ma29535	X					X		X	
14	TP06_0.6	Mar 24, 2017		Soil	S17-Ma29536						X	X		
15	TP07_0.1	Mar 24, 2017		Soil	S17-Ma29537	X					X	X		
16	TP07_0.6	Mar 24, 2017		Soil	S17-Ma29538						X	X		
17	TP08_0.1	Mar 24, 2017		Soil	S17-Ma29539		X				X	X		
18	TP08_0.5	Mar 24, 2017		Soil	S17-Ma29540					X				
19	TP08_1.5	Mar 24, 2017		Soil	S17-Ma29541						X	X		
20	TP08_3.9	Mar 24, 2017		Soil	S17-Ma29542						X	X		
21	TP09_0.1	Mar 24, 2017		Soil	S17-Ma29543	X					X	X		

<b>Company Name:</b>	DRC Environmental Pty Ltd	<b>Order No.:</b>		<b>Received:</b>	Mar 27, 2017 11:20 AM
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<b>Project Name:</b>	DUNHEVED CIRCUIT	<b>Phone:</b>	0402 455 638	<b>Priority:</b>	5 Day
<b>Project ID:</b>	ST MARYS	<b>Fax:</b>		<b>Contact Name:</b>	Patrick Baldwin

**Eurofins | mgt Analytical Services Manager : Mary Makarios**

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<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>													X	
<b>Sydney Laboratory - NATA Site # 18217</b>						X	X	X	X	X	X	X	X	X
<b>Brisbane Laboratory - NATA Site # 20794</b>														
<b>Perth Laboratory - NATA Site # 18217</b>														
22	TP09_2.5	Mar 24, 2017		Soil	S17-Ma29544						X	X		
23	TP10_0.1	Mar 24, 2017		Soil	S17-Ma29545						X	X		
24	TP10_2.8	Mar 24, 2017		Soil	S17-Ma29546					X				
25	SS01	Mar 24, 2017		Soil	S17-Ma29547						X	X		
26	TP11_0.2	Mar 24, 2017		Soil	S17-Ma29548			X			X	X		
27	TP11_0.7	Mar 24, 2017		Soil	S17-Ma29549						X	X		
28	TP11_2.9	Mar 24, 2017		Soil	S17-Ma29550				X					
29	TP12_0.1	Mar 24, 2017		Soil	S17-Ma29551			X			X		X	
30	TP12_2.2	Mar 24, 2017		Soil	S17-Ma29552						X	X		
31	TP12_3.2	Mar 24, 2017		Soil	S17-Ma29553					X				
32	TP13_0.1	Mar 24, 2017		Soil	S17-Ma29554			X			X	X		
33	TP13_1.2	Mar 24, 2017		Soil	S17-Ma29555						X	X		

<b>Company Name:</b> DRC Environmental Pty Ltd	<b>Order No.:</b>	<b>Received:</b> Mar 27, 2017 11:20 AM
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<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>													X	
<b>Sydney Laboratory - NATA Site # 18217</b>						X	X	X	X	X	X	X	X	X
<b>Brisbane Laboratory - NATA Site # 20794</b>														
<b>Perth Laboratory - NATA Site # 18217</b>														
34	TP13_2.9	Mar 24, 2017		Soil	S17-Ma29556					X				
35	TP14_0.2	Mar 24, 2017		Soil	S17-Ma29557	X					X	X		
36	TP14_1.4	Mar 24, 2017		Soil	S17-Ma29558						X	X		
37	TP14_2.9	Mar 24, 2017		Soil	S17-Ma29559					X				
38	TB01	Mar 24, 2017		Water	S17-Ma29560									X
39	TP15_0.1	Mar 25, 2017		Soil	S17-Ma29562			X			X		X	
40	TP15_2.0	Mar 25, 2017		Soil	S17-Ma29563						X	X		
41	TP15_3.5	Mar 25, 2017		Soil	S17-Ma29564						X	X		
42	TP16_0.2	Mar 25, 2017		Soil	S17-Ma29565			X			X	X		
43	TP16_1.0	Mar 25, 2017		Soil	S17-Ma29566						X	X		
44	TP17_0.2	Mar 25, 2017		Soil	S17-Ma29567			X			X	X		
45	TP17_1.5	Mar 25, 2017		Soil	S17-Ma29568					X				

<b>Company Name:</b> DRC Environmental Pty Ltd	<b>Order No.:</b>	<b>Received:</b> Mar 27, 2017 11:20 AM
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Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	Moisture Set	ENM Exemption Suite -The excavated natural material order 2014 NSW	NSW DECC - Waste Classification Table 1	BTEX and Volatile TRH
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>													X	
<b>Sydney Laboratory - NATA Site # 18217</b>						X	X	X	X	X	X	X	X	X
<b>Brisbane Laboratory - NATA Site # 20794</b>														
<b>Perth Laboratory - NATA Site # 18217</b>														
46	TP17_3.5	Mar 25, 2017		Soil	S17-Ma29569						X	X		
47	TP16_3.0	Mar 25, 2017		Soil	S17-Ma29570					X				
48	TP18_0.2	Mar 25, 2017		Soil	S17-Ma29571			X			X	X		
49	TP18_2.5	Mar 25, 2017		Soil	S17-Ma29572						X	X		
50	QC01_250317	Mar 25, 2017		Soil	S17-Ma29573			X			X	X		
51	QC03_250317	Mar 25, 2017		Soil	S17-Ma29574						X	X		
52	TP19_0.2	Mar 25, 2017		Soil	S17-Ma29575						X	X		
53	TP19_3.5	Mar 25, 2017		Soil	S17-Ma29576						X	X		
54	TB03_250317	Mar 25, 2017		Water	S17-Ma29577									X
55	TB04_250317	Mar 25, 2017		Water	S17-Ma29578									X
56	TP19	Mar 25, 2017		Other	S17-Ma29579			X						
<b>Test Counts</b>						6	3	9	1	10	41	37	4	3

## Internal Quality Control Review and Glossary

### General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. 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 Sample Receipt Advice.

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.

### Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

### Terms

<b>Dry</b>	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
<b>LOR</b>	Limit of Reporting.
<b>COC</b>	Chain of custody
<b>SRA</b>	Sample Receipt Advice
<b>ISO</b>	International Standards Organisation
<b>AS</b>	Australian Standards
<b>WA DOH</b>	Western Australia Department of Health
<b>NOHSC</b>	National Occupational Health and Safety Commission
<b>ACM</b>	Bonded asbestos-containing material means any material containing more than 1% asbestos and comprises asbestos-containing-material which is in sound condition, although possibly broken or fragmented, and where the asbestos is bound in a matrix such as cement or resin. Common examples of ACM include but are not limited to: pipe and boiler insulation, sprayed-on fireproofing, troweled-on acoustical plaster, floor tile and mastic, floor linoleum, transite shingles, roofing materials, wall and ceiling plaster, ceiling tiles, and gasket materials. This term is restricted to material that cannot pass a 7 mm x 7 mm sieve. This sieve size is selected because it approximates the thickness of common asbestos cement sheeting and for fragments to be smaller than this would imply a high degree of damage and hence potential for fibre release.
<b>FA</b>	FA comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. This material is typically unbonded or was previously bonded and is now significantly degraded (crumbling).
<b>PACM</b>	Presumed Asbestos-Containing Material means thermal system insulation and surfacing material found in buildings, vessels, and vessel sections constructed no later than 1980 that are assumed to contain greater than one percent asbestos but have not been sampled or analyzed to verify or negate the presence of asbestos.
<b>AF</b>	Asbestos fines (AF) are defined as free fibres, or fibre bundles, smaller than 7mm. It is the free fibres which present the greatest risk to human health, although very small fibres (< 5 microns in length) are not considered to be such a risk. AF also includes small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve. (Note that for bonded ACM fragments to pass through a 7 mm x 7 mm sieve implies a substantial degree of damage which increases the potential for fibre release.)
<b>AC</b>	Asbestos cement means a mixture of cement and asbestos fibres (typically 90:10 ratios).

**Comments**

Ma29521, 29528 and 29539: Sample received was less than the nominal 500mL as recommended in Section 4.10 of the NEPM Schedule B1 - Guideline on Investigation Levels for Soil and Groundwater.

Ma29521, 29528 and 29539: Sample received was less than the nominal 500mL as recommended in Section 4.10 of the NEPM Schedule B1 - Guideline on Investigation Levels for Soil and Groundwater.

**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
N/A	Not applicable
M11	NATA accreditation does not cover the performance of this service.

**Authorised by:**

Nibha Vaidya                      Senior Analyst - Asbestos (NSW)



**Glenn Jackson**  
**National Operations Manager**

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

Uncertainty data is available on request

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DRC Environmental Pty Ltd  
 Suite G6/79-109 Manningham Rd  
 Bulleen  
 VIC 3105



NATA Accredited  
 Accreditation Number 1261  
 Site Number 18217

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: Patrick Baldwin

Report 539755-S  
 Project name DUNHEVED CIRCUIT  
 Project ID ST MARYS  
 Received Date Mar 27, 2017

Client Sample ID			TP01_0.1	TP01_0.7	TP02_0.05	TP02_1.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29521	S17-Ma29522	S17-Ma29524	S17-Ma29527
Date Sampled			Mar 24, 2017	Mar 24, 2017	Mar 24, 2017	Mar 24, 2017
Test/Reference	LOR	Unit				
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	24	< 20	23
TRH C15-C28	50	mg/kg	120	< 50	110	< 50
TRH C29-C36	50	mg/kg	120	< 50	110	< 50
TRH C10-36 (Total)	50	mg/kg	240	< 50	220	< 50
<b>BTEX</b>						
Benzene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	73	76	-	73
<b>Volatile Organics</b>						
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	-

Client Sample ID			TP01_0.1	TP01_0.7	TP02_0.05	TP02_1.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29521	S17-Ma29522	S17-Ma29524	S17-Ma29527
Date Sampled			Mar 24, 2017	Mar 24, 2017	Mar 24, 2017	Mar 24, 2017
Test/Reference	LOR	Unit				
<b>Volatile Organics</b>						
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	-
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	-
Fluorobenzene (surr.)	1	%	-	-	98	-
4-Bromofluorobenzene (surr.)	1	%	-	-	100	-
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>						
Naphthalene <sup>N02</sup>	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2) <sup>N01</sup>	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) <sup>N04</sup>	20	mg/kg	< 20	< 20	< 20	< 20
<b>Polycyclic Aromatic Hydrocarbons</b>						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	1.1	< 0.5	2.9	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	1.4	0.6	3.1	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.6	1.2	3.4	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	0.8	< 0.5
Benz(a)anthracene	0.5	mg/kg	0.7	< 0.5	1.8	< 0.5
Benzo(a)pyrene	0.5	mg/kg	0.8	< 0.5	2.1	< 0.5
Benzo(b&j)fluoranthene <sup>N07</sup>	0.5	mg/kg	1.2	< 0.5	2.6	< 0.5

Client Sample ID			TP01_0.1	TP01_0.7	TP02_0.05	TP02_1.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29521	S17-Ma29522	S17-Ma29524	S17-Ma29527
Date Sampled			Mar 24, 2017	Mar 24, 2017	Mar 24, 2017	Mar 24, 2017
Test/Reference	LOR	Unit				
<b>Polycyclic Aromatic Hydrocarbons</b>						
Benzo(g,h,i)perylene	0.5	mg/kg	0.9	< 0.5	2.4	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	0.7	< 0.5	1.4	< 0.5
Chrysene	0.5	mg/kg	0.9	< 0.5	1.8	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	1.9	< 0.5	5.4	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	0.7	< 0.5	1.7	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	0.7	< 0.5	2.5	< 0.5
Pyrene	0.5	mg/kg	1.8	< 0.5	4.9	< 0.5
Total PAH*	0.5	mg/kg	10.3	< 0.5	27.4	< 0.5
2-Fluorobiphenyl (surr.)	1	%	86	87	92	79
p-Terphenyl-d14 (surr.)	1	%	89	133	99	133
<b>Organochlorine Pesticides</b>						
Chlordanes - Total	0.1	mg/kg	-	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	-	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	-	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	-	-	< 0.05	-
a-BHC	0.05	mg/kg	-	-	< 0.05	-
Aldrin	0.05	mg/kg	-	-	< 0.05	-
b-BHC	0.05	mg/kg	-	-	< 0.05	-
d-BHC	0.05	mg/kg	-	-	< 0.05	-
Dieldrin	0.05	mg/kg	-	-	< 0.05	-
Endosulfan I	0.05	mg/kg	-	-	< 0.05	-
Endosulfan II	0.05	mg/kg	-	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05	-
Endrin	0.05	mg/kg	-	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	-	-	< 0.05	-
Endrin ketone	0.05	mg/kg	-	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	-	-	< 0.05	-
Heptachlor	0.05	mg/kg	-	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	-	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	-
Methoxychlor	0.2	mg/kg	-	-	< 0.2	-
Toxaphene	1	mg/kg	-	-	< 1	-
Dibutylchloroendate (surr.)	1	%	-	-	133	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	122	-
Nitrobenzene	0.5	mg/kg	-	-	< 0.5	-
<b>Organophosphorus Pesticides</b>						
Azinphos-methyl	0.2	mg/kg	-	-	< 0.2	-
Bolstar	0.2	mg/kg	-	-	< 0.2	-
Chlorfenvinphos	0.2	mg/kg	-	-	< 0.2	-
Chlorpyrifos	0.2	mg/kg	-	-	< 0.2	-
Chlorpyrifos-methyl	0.2	mg/kg	-	-	< 0.2	-
Coumaphos	2	mg/kg	-	-	< 2	-
Demeton-S	0.2	mg/kg	-	-	< 0.2	-
Demeton-O	0.2	mg/kg	-	-	< 0.2	-
Diazinon	0.2	mg/kg	-	-	< 0.2	-

Client Sample ID			TP01_0.1	TP01_0.7	TP02_0.05	TP02_1.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29521	S17-Ma29522	S17-Ma29524	S17-Ma29527
Date Sampled			Mar 24, 2017	Mar 24, 2017	Mar 24, 2017	Mar 24, 2017
Test/Reference	LOR	Unit				
<b>Organophosphorus Pesticides</b>						
Dichlorvos	0.2	mg/kg	-	-	< 0.2	-
Dimethoate	0.2	mg/kg	-	-	< 0.2	-
Disulfoton	0.2	mg/kg	-	-	< 0.2	-
EPN	0.2	mg/kg	-	-	< 0.2	-
Ethion	0.2	mg/kg	-	-	< 0.2	-
Ethoprop	0.2	mg/kg	-	-	< 0.2	-
Ethyl parathion	0.2	mg/kg	-	-	< 0.2	-
Fenitrothion	0.2	mg/kg	-	-	< 0.2	-
Fensulfothion	0.2	mg/kg	-	-	< 0.2	-
Fenthion	0.2	mg/kg	-	-	< 0.2	-
Malathion	0.2	mg/kg	-	-	< 0.2	-
Merphos	0.2	mg/kg	-	-	< 0.2	-
Methyl parathion	0.2	mg/kg	-	-	< 0.2	-
Mevinphos	0.2	mg/kg	-	-	< 0.2	-
Monocrotophos	2	mg/kg	-	-	< 2	-
Omethoate	2	mg/kg	-	-	< 2	-
Phorate	0.2	mg/kg	-	-	< 0.2	-
Pirimiphos-methyl	0.2	mg/kg	-	-	< 0.2	-
Pyrazophos	0.2	mg/kg	-	-	< 0.2	-
Ronnel	0.2	mg/kg	-	-	< 0.2	-
Terbufos	0.2	mg/kg	-	-	< 0.2	-
Tetrachlorvinphos	0.2	mg/kg	-	-	< 0.2	-
Tokuthion	0.2	mg/kg	-	-	< 0.2	-
Trichloronate	0.2	mg/kg	-	-	< 0.2	-
Triphenylphosphate (surr.)	1	%	-	-	116	-
<b>Acid Herbicides</b>						
2,4-D	0.5	mg/kg	-	-	< 0.5	-
2,4-DB	0.5	mg/kg	-	-	< 0.5	-
2,4,5-T	0.5	mg/kg	-	-	< 0.5	-
2,4,5-TP	0.5	mg/kg	-	-	< 0.5	-
Actril (loxynil)	0.5	mg/kg	-	-	< 0.5	-
Dicamba	0.5	mg/kg	-	-	< 0.5	-
Dichlorprop	0.5	mg/kg	-	-	< 0.5	-
Dinitro-o-cresol	0.5	mg/kg	-	-	< 0.5	-
Dinoseb	0.5	mg/kg	-	-	< 0.5	-
MCPA	0.5	mg/kg	-	-	< 0.5	-
MCPB	0.5	mg/kg	-	-	< 0.5	-
Mecoprop	0.5	mg/kg	-	-	< 0.5	-
Warfarin (surr.)	1	%	-	-	82	-
<b>Phenols (Halogenated)</b>						
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	1.0	mg/kg	-	-	< 1	-
2,6-Dichlorophenol	0.5	mg/kg	-	-	< 0.5	-
4-Chloro-3-methylphenol	1.0	mg/kg	-	-	< 1	-
Pentachlorophenol	1.0	mg/kg	-	-	< 1	-
Tetrachlorophenols - Total	1.0	mg/kg	-	-	< 1	-
Total Halogenated Phenol*	1	mg/kg	-	-	< 1	-

Client Sample ID			TP01_0.1	TP01_0.7	TP02_0.05	TP02_1.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29521	S17-Ma29522	S17-Ma29524	S17-Ma29527
Date Sampled			Mar 24, 2017	Mar 24, 2017	Mar 24, 2017	Mar 24, 2017
Test/Reference	LOR	Unit				
<b>Phenols (non-Halogenated)</b>						
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	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	-
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	-
<b>Phthalates</b>						
Bis(2-ethylhexyl)phthalate	5	mg/kg	-	-	< 5	-
Butyl benzyl phthalate	0.5	mg/kg	-	-	< 0.5	-
Di-n-butyl phthalate	0.5	mg/kg	-	-	< 0.5	-
Di-n-octyl phthalate	0.5	mg/kg	-	-	< 0.5	-
Diethyl phthalate	0.5	mg/kg	-	-	< 0.5	-
Dimethyl phthalate	0.5	mg/kg	-	-	< 0.5	-
Nitrobenzene-d5 (surr.)	1	%	-	-	86	-
p-Terphenyl-d14 (surr.)	1	%	-	-	99	-
2-Fluorobiphenyl (surr.)	1	%	-	-	92	-
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	190	< 100	160	< 100
TRH >C34-C40	100	mg/kg	100	< 100	100	< 100
<b>Semivolatile Organic Compounds (SVOC)</b>						
2.4-Dinitrotoluene	1	mg/kg	-	-	< 2.5	-
<b>Other Parameters</b>						
Chromium (hexavalent)	1	mg/kg	-	-	< 1	-
Conductivity (1:5 aqueous extract at 25°C)	5	uS/cm	65	220	-	290
Cyanide (free)	5	mg/kg	-	-	< 5	-
Cyanide (total)	5	mg/kg	-	-	< 5	-
Fluoride	100	mg/kg	-	-	130	-
pH (1:5 Aqueous extract)	0.1	pH Units	7.8	5.3	-	5.1
% Moisture	1	%	11	18	15	21
<b>Heavy Metals</b>						
Arsenic	2	mg/kg	4.4	7.4	3.7	< 2
Beryllium	2	mg/kg	-	-	< 2	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	13	12	-	< 5
Copper	5	mg/kg	100	8.3	-	< 5
Lead	5	mg/kg	39	7.9	27	< 5
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	-	-	< 5	-
Nickel	5	mg/kg	9.6	< 5	27	< 5
Selenium	2	mg/kg	-	-	< 2	-
Silver	0.2	mg/kg	-	-	< 0.2	-
Zinc	5	mg/kg	190	< 5	-	< 5

Client Sample ID			TP03_0.1	TP03_1.2	TP04_0.6	TP05_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29528	S17-Ma29530	S17-Ma29531	S17-Ma29532
Date Sampled			Mar 24, 2017	Mar 24, 2017	Mar 24, 2017	Mar 24, 2017
Test/Reference	LOR	Unit				
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	26	< 20	31
TRH C15-C28	50	mg/kg	68	< 50	< 50	330
TRH C29-C36	50	mg/kg	97	< 50	< 50	370
TRH C10-36 (Total)	50	mg/kg	165	< 50	< 50	731
<b>BTEX</b>						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	74	69	73	73
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>						
Naphthalene <sup>N02</sup>	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2) <sup>N01</sup>	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) <sup>N04</sup>	20	mg/kg	< 20	< 20	< 20	< 20
<b>Polycyclic Aromatic Hydrocarbons</b>						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene <sup>N07</sup>	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	91	82	97	87
p-Terphenyl-d14 (surr.)	1	%	103	132	104	92
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	120	< 100	< 100	570
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	260
<b>Conductivity (1:5 aqueous extract at 25°C)</b>						
Conductivity (1:5 aqueous extract at 25°C)	5	uS/cm	110	27	320	200
<b>pH (1:5 Aqueous extract)</b>						
pH (1:5 Aqueous extract)	0.1	pH Units	9.1	6.0	4.9	8.2
<b>% Moisture</b>						
% Moisture	1	%	9.8	16	19	11

Client Sample ID			TP03_0.1	TP03_1.2	TP04_0.6	TP05_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29528	S17-Ma29530	S17-Ma29531	S17-Ma29532
Date Sampled			Mar 24, 2017	Mar 24, 2017	Mar 24, 2017	Mar 24, 2017
Test/Reference	LOR	Unit				
<b>Heavy Metals</b>						
Arsenic	2	mg/kg	2.9	< 2	< 2	4.8
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	24	6.2	< 5	12
Copper	5	mg/kg	70	6.0	< 5	32
Lead	5	mg/kg	65	5.6	< 5	17
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	19	< 5	< 5	15
Zinc	5	mg/kg	120	< 5	< 5	51

Client Sample ID			TP05_0.6	TP06_0.1	TP06_0.6	TP07_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29534	S17-Ma29535	S17-Ma29536	S17-Ma29537
Date Sampled			Mar 24, 2017	Mar 24, 2017	Mar 24, 2017	Mar 24, 2017
Test/Reference	LOR	Unit				
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	63	< 20	30
TRH C15-C28	50	mg/kg	< 50	13000	< 50	69
TRH C29-C36	50	mg/kg	< 50	13000	< 50	110
TRH C10-36 (Total)	50	mg/kg	< 50	26063	< 50	209
<b>BTEX</b>						
Benzene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	-	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	73	-	92	71
<b>Volatile Organics</b>						
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	-	-

Client Sample ID			TP05_0.6	TP06_0.1	TP06_0.6	TP07_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29534	S17-Ma29535	S17-Ma29536	S17-Ma29537
Date Sampled			Mar 24, 2017	Mar 24, 2017	Mar 24, 2017	Mar 24, 2017
Test/Reference	LOR	Unit				
<b>Volatile Organics</b>						
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	-	-
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	-	-
Fluorobenzene (surr.)	1	%	-	100	-	-
4-Bromofluorobenzene (surr.)	1	%	-	103	-	-
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>						
Naphthalene <sup>N02</sup>	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2) <sup>N01</sup>	50	mg/kg	< 50	64	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) <sup>N04</sup>	20	mg/kg	< 20	< 20	< 20	< 20
<b>Polycyclic Aromatic Hydrocarbons</b>						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			TP05_0.6	TP06_0.1	TP06_0.6	TP07_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29534	S17-Ma29535	S17-Ma29536	S17-Ma29537
Date Sampled			Mar 24, 2017	Mar 24, 2017	Mar 24, 2017	Mar 24, 2017
Test/Reference	LOR	Unit				
<b>Polycyclic Aromatic Hydrocarbons</b>						
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene <sup>N07</sup>	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	98	85	65	69
p-Terphenyl-d14 (surr.)	1	%	110	105	102	99
<b>Organochlorine Pesticides</b>						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	-
a-BHC	0.05	mg/kg	-	< 0.05	-	-
Aldrin	0.05	mg/kg	-	< 0.05	-	-
b-BHC	0.05	mg/kg	-	< 0.05	-	-
d-BHC	0.05	mg/kg	-	< 0.05	-	-
Dieldrin	0.05	mg/kg	-	< 0.05	-	-
Endosulfan I	0.05	mg/kg	-	< 0.05	-	-
Endosulfan II	0.05	mg/kg	-	< 0.05	-	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	-
Endrin	0.05	mg/kg	-	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	-
Endrin ketone	0.05	mg/kg	-	< 0.05	-	-
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	-	-
Heptachlor	0.05	mg/kg	-	< 0.05	-	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	-
Methoxychlor	0.2	mg/kg	-	< 0.2	-	-
Toxaphene	1	mg/kg	-	< 1	-	-
Dibutylchloroendate (surr.)	1	%	-	125	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	75	-	-
Nitrobenzene	0.5	mg/kg	-	< 0.5	-	-
<b>Organophosphorus Pesticides</b>						
Azinphos-methyl	0.2	mg/kg	-	< 0.2	-	-
Bolstar	0.2	mg/kg	-	< 0.2	-	-
Chlorfenvinphos	0.2	mg/kg	-	< 0.2	-	-
Chlorpyrifos	0.2	mg/kg	-	< 0.2	-	-
Chlorpyrifos-methyl	0.2	mg/kg	-	< 0.2	-	-
Coumaphos	2	mg/kg	-	< 2	-	-
Demeton-S	0.2	mg/kg	-	< 0.2	-	-

Client Sample ID			TP05_0.6	TP06_0.1	TP06_0.6	TP07_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29534	S17-Ma29535	S17-Ma29536	S17-Ma29537
Date Sampled			Mar 24, 2017	Mar 24, 2017	Mar 24, 2017	Mar 24, 2017
Test/Reference	LOR	Unit				
<b>Organophosphorus Pesticides</b>						
Demeton-O	0.2	mg/kg	-	< 0.2	-	-
Diazinon	0.2	mg/kg	-	< 0.2	-	-
Dichlorvos	0.2	mg/kg	-	< 0.2	-	-
Dimethoate	0.2	mg/kg	-	< 0.2	-	-
Disulfoton	0.2	mg/kg	-	< 0.2	-	-
EPN	0.2	mg/kg	-	< 0.2	-	-
Ethion	0.2	mg/kg	-	< 0.2	-	-
Ethoprop	0.2	mg/kg	-	< 0.2	-	-
Ethyl parathion	0.2	mg/kg	-	< 0.2	-	-
Fenitrothion	0.2	mg/kg	-	< 0.2	-	-
Fensulfothion	0.2	mg/kg	-	< 0.2	-	-
Fenthion	0.2	mg/kg	-	< 0.2	-	-
Malathion	0.2	mg/kg	-	< 0.2	-	-
Merphos	0.2	mg/kg	-	< 0.2	-	-
Methyl parathion	0.2	mg/kg	-	< 0.2	-	-
Mevinphos	0.2	mg/kg	-	< 0.2	-	-
Monocrotophos	2	mg/kg	-	< 2	-	-
Omethoate	2	mg/kg	-	< 2	-	-
Phorate	0.2	mg/kg	-	< 0.2	-	-
Pirimiphos-methyl	0.2	mg/kg	-	< 0.2	-	-
Pyrazophos	0.2	mg/kg	-	< 0.2	-	-
Ronnel	0.2	mg/kg	-	< 0.2	-	-
Terbufos	0.2	mg/kg	-	< 0.2	-	-
Tetrachlorvinphos	0.2	mg/kg	-	< 0.2	-	-
Tokuthion	0.2	mg/kg	-	< 0.2	-	-
Trichloronate	0.2	mg/kg	-	< 0.2	-	-
Triphenylphosphate (surr.)	1	%	-	124	-	-
<b>Acid Herbicides</b>						
2.4-D	0.5	mg/kg	-	< 0.5	-	-
2.4-DB	0.5	mg/kg	-	< 0.5	-	-
2.4.5-T	0.5	mg/kg	-	< 0.5	-	-
2.4.5-TP	0.5	mg/kg	-	< 0.5	-	-
Actril (loxynil)	0.5	mg/kg	-	< 0.5	-	-
Dicamba	0.5	mg/kg	-	< 0.5	-	-
Dichlorprop	0.5	mg/kg	-	< 0.5	-	-
Dinitro-o-cresol	0.5	mg/kg	-	< 0.5	-	-
Dinoseb	0.5	mg/kg	-	< 0.5	-	-
MCPA	0.5	mg/kg	-	< 0.5	-	-
MCPB	0.5	mg/kg	-	< 0.5	-	-
Mecoprop	0.5	mg/kg	-	< 0.5	-	-
Warfarin (surr.)	1	%	-	100	-	-
<b>Phenols (Halogenated)</b>						
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	1.0	mg/kg	-	< 1	-	-
2.6-Dichlorophenol	0.5	mg/kg	-	< 0.5	-	-
4-Chloro-3-methylphenol	1.0	mg/kg	-	< 1	-	-
Pentachlorophenol	1.0	mg/kg	-	< 1	-	-

Client Sample ID			TP05_0.6	TP06_0.1	TP06_0.6	TP07_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29534	S17-Ma29535	S17-Ma29536	S17-Ma29537
Date Sampled			Mar 24, 2017	Mar 24, 2017	Mar 24, 2017	Mar 24, 2017
Test/Reference	LOR	Unit				
<b>Phenols (Halogenated)</b>						
Tetrachlorophenols - Total	1.0	mg/kg	-	< 1	-	-
Total Halogenated Phenol*	1	mg/kg	-	< 1	-	-
<b>Phenols (non-Halogenated)</b>						
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	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	-	-
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	-	-
<b>Phthalates</b>						
Bis(2-ethylhexyl)phthalate	5	mg/kg	-	< 5	-	-
Butyl benzyl phthalate	0.5	mg/kg	-	< 0.5	-	-
Di-n-butyl phthalate	0.5	mg/kg	-	< 0.5	-	-
Di-n-octyl phthalate	0.5	mg/kg	-	< 0.5	-	-
Diethyl phthalate	0.5	mg/kg	-	< 0.5	-	-
Dimethyl phthalate	0.5	mg/kg	-	< 0.5	-	-
Nitrobenzene-d5 (surr.)	1	%	-	83	-	-
p-Terphenyl-d14 (surr.)	1	%	-	105	-	-
2-Fluorobiphenyl (surr.)	1	%	-	85	-	-
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>						
TRH >C10-C16	50	mg/kg	< 50	64	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	22000	< 100	130
TRH >C34-C40	100	mg/kg	< 100	5500	< 100	160
<b>Semivolatile Organic Compounds (SVOC)</b>						
2.4-Dinitrotoluene	1	mg/kg	-	< 2.5	-	-
<b>Chromium (hexavalent)</b>						
Chromium (hexavalent)	1	mg/kg	-	< 1	-	-
Conductivity (1:5 aqueous extract at 25°C)	5	uS/cm	310	-	360	150
Cyanide (free)	5	mg/kg	-	< 5	-	-
Cyanide (total)	5	mg/kg	-	< 5	-	-
Fluoride	100	mg/kg	-	100	-	-
pH (1:5 Aqueous extract)	0.1	pH Units	4.6	-	4.5	9.8
% Moisture	1	%	23	5.8	23	24
<b>Heavy Metals</b>						
Arsenic	2	mg/kg	4.2	2.4	4.5	< 2
Beryllium	2	mg/kg	-	< 2	-	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	8.7	-	15	6.5
Copper	5	mg/kg	< 5	-	< 5	29
Lead	5	mg/kg	5.6	16	6.4	14
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	-	< 5	-	-
Nickel	5	mg/kg	< 5	17	< 5	5.2
Selenium	2	mg/kg	-	2.3	-	-

<b>Client Sample ID</b>			<b>TP05_0.6</b>	<b>TP06_0.1</b>	<b>TP06_0.6</b>	<b>TP07_0.1</b>
<b>Sample Matrix</b>			<b>Soil</b>	<b>Soil</b>	<b>Soil</b>	<b>Soil</b>
<b>Eurofins   mgt Sample No.</b>			<b>S17-Ma29534</b>	<b>S17-Ma29535</b>	<b>S17-Ma29536</b>	<b>S17-Ma29537</b>
<b>Date Sampled</b>			<b>Mar 24, 2017</b>	<b>Mar 24, 2017</b>	<b>Mar 24, 2017</b>	<b>Mar 24, 2017</b>
Test/Reference	LOR	Unit				
<b>Heavy Metals</b>						
Silver	0.2	mg/kg	-	< 0.2	-	-
Zinc	5	mg/kg	< 5	-	< 5	87

<b>Client Sample ID</b>			<b>TP07_0.6</b>	<b>TP08_0.1</b>	<b>TP08_1.5</b>	<b>TP08_3.9</b>
<b>Sample Matrix</b>			<b>Soil</b>	<b>Soil</b>	<b>Soil</b>	<b>Soil</b>
<b>Eurofins   mgt Sample No.</b>			<b>S17-Ma29538</b>	<b>S17-Ma29539</b>	<b>S17-Ma29541</b>	<b>S17-Ma29542</b>
<b>Date Sampled</b>			<b>Mar 24, 2017</b>	<b>Mar 24, 2017</b>	<b>Mar 24, 2017</b>	<b>Mar 24, 2017</b>
Test/Reference	LOR	Unit				
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	26	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	170	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	310	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	480	< 50	< 50
<b>BTEX</b>						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	72	72	73	72
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>						
Naphthalene <sup>N02</sup>	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2) <sup>N01</sup>	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) <sup>N04</sup>	20	mg/kg	< 20	< 20	< 20	< 20
<b>Polycyclic Aromatic Hydrocarbons</b>						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene <sup>N07</sup>	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			TP07_0.6	TP08_0.1	TP08_1.5	TP08_3.9
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29538	S17-Ma29539	S17-Ma29541	S17-Ma29542
Date Sampled			Mar 24, 2017	Mar 24, 2017	Mar 24, 2017	Mar 24, 2017
Test/Reference	LOR	Unit				
<b>Polycyclic Aromatic Hydrocarbons</b>						
2-Fluorobiphenyl (surr.)	1	%	76	80	66	93
p-Terphenyl-d14 (surr.)	1	%	117	94	103	115
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	330	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	300	< 100	< 100
<b>Conductivity (1:5 aqueous extract at 25°C)</b>						
	5	uS/cm	65	78	340	140
<b>pH (1:5 Aqueous extract)</b>						
	0.1	pH Units	5.3	8.7	5.6	6.6
<b>% Moisture</b>						
	1	%	24	15	22	21
<b>Heavy Metals</b>						
Arsenic	2	mg/kg	6.6	2.5	9.2	3.5
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	20	34	12	11
Copper	5	mg/kg	< 5	20	21	20
Lead	5	mg/kg	8.7	5.9	22	25
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	40	8.3	7.9
Zinc	5	mg/kg	< 5	37	52	30

Client Sample ID			TP09_0.1	TP09_2.5	TP10_0.1	SS01
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29543	S17-Ma29544	S17-Ma29545	S17-Ma29547
Date Sampled			Mar 24, 2017	Mar 24, 2017	Mar 24, 2017	Mar 24, 2017
Test/Reference	LOR	Unit				
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	33	< 20	23	300
TRH C15-C28	50	mg/kg	210	< 50	56	5200
TRH C29-C36	50	mg/kg	500	< 50	88	2900
TRH C10-36 (Total)	50	mg/kg	743	< 50	167	8400
<b>BTEX</b>						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	72	73	73	74
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>						
Naphthalene <sup>N02</sup>	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2) <sup>N01</sup>	50	mg/kg	< 50	< 50	< 50	800
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) <sup>N04</sup>	20	mg/kg	< 20	< 20	< 20	< 20

Client Sample ID			TP09_0.1	TP09_2.5	TP10_0.1	SS01
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29543	S17-Ma29544	S17-Ma29545	S17-Ma29547
Date Sampled			Mar 24, 2017	Mar 24, 2017	Mar 24, 2017	Mar 24, 2017
Test/Reference	LOR	Unit				
<b>Polycyclic Aromatic Hydrocarbons</b>						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene <sup>N07</sup>	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	0.6	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	1.1	< 0.5
2-Fluorobiphenyl (surr.)	1	%	115	93	102	102
p-Terphenyl-d14 (surr.)	1	%	106	112	112	73
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	800
TRH >C16-C34	100	mg/kg	500	< 100	110	6300
TRH >C34-C40	100	mg/kg	650	< 100	110	1200
<b>Conductivity (1:5 aqueous extract at 25°C)</b>						
	5	uS/cm	94	200	210	120
<b>pH (1:5 Aqueous extract)</b>						
	0.1	pH Units	9.0	7.1	7.5	8.5
<b>% Moisture</b>						
	1	%	12	22	18	18
<b>Heavy Metals</b>						
Arsenic	2	mg/kg	< 2	8.0	9.2	5.2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	30	14	28	6.7
Copper	5	mg/kg	38	28	11	32
Lead	5	mg/kg	< 5	71	41	16
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	40	8.6	< 5	14
Zinc	5	mg/kg	37	67	86	110

Client Sample ID			TP11_0.2	TP11_0.7	TP12_0.1	TP12_2.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29548	S17-Ma29549	S17-Ma29551	S17-Ma29552
Date Sampled			Mar 24, 2017	Mar 24, 2017	Mar 24, 2017	Mar 24, 2017
Test/Reference	LOR	Unit				
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	30	27	24	30
TRH C15-C28	50	mg/kg	240	170	< 50	160
TRH C29-C36	50	mg/kg	200	94	52	66
TRH C10-36 (Total)	50	mg/kg	470	291	76	256
<b>BTEX</b>						
Benzene	0.1	mg/kg	< 0.1	0.6	-	< 0.1
Toluene	0.1	mg/kg	< 0.1	0.5	-	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	0.1	-	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	68	75	-	73
<b>Volatile Organics</b>						
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	-

Client Sample ID			TP11_0.2	TP11_0.7	TP12_0.1	TP12_2.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29548	S17-Ma29549	S17-Ma29551	S17-Ma29552
Date Sampled			Mar 24, 2017	Mar 24, 2017	Mar 24, 2017	Mar 24, 2017
Test/Reference	LOR	Unit				
<b>Volatile Organics</b>						
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	-
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	-
Fluorobenzene (surr.)	1	%	-	-	100	-
4-Bromofluorobenzene (surr.)	1	%	-	-	100	-
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>						
Naphthalene <sup>N02</sup>	0.5	mg/kg	< 0.5	0.9	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2) <sup>N01</sup>	50	mg/kg	< 50	< 50	< 50	54
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) <sup>N04</sup>	20	mg/kg	< 20	< 20	< 20	< 20
<b>Polycyclic Aromatic Hydrocarbons</b>						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	1.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	1.7	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	2.0	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	2.0	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	1.1	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	1.1	< 0.5	< 0.5
Benzo(b&j)fluoranthene <sup>N07</sup>	0.5	mg/kg	< 0.5	1.1	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	0.8	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	0.7	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	0.9	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	2.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	0.6	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	1.2	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	2.1	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	14.6	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	112	92	97	116
p-Terphenyl-d14 (surr.)	1	%	93	98	117	108

Client Sample ID			TP11_0.2	TP11_0.7	TP12_0.1	TP12_2.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29548	S17-Ma29549	S17-Ma29551	S17-Ma29552
Date Sampled			Mar 24, 2017	Mar 24, 2017	Mar 24, 2017	Mar 24, 2017
Test/Reference	LOR	Unit				
<b>Organochlorine Pesticides</b>						
Chlordanes - Total	0.1	mg/kg	-	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	-	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	-	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	-	-	< 0.05	-
a-BHC	0.05	mg/kg	-	-	< 0.05	-
Aldrin	0.05	mg/kg	-	-	< 0.05	-
b-BHC	0.05	mg/kg	-	-	< 0.05	-
d-BHC	0.05	mg/kg	-	-	< 0.05	-
Dieldrin	0.05	mg/kg	-	-	< 0.05	-
Endosulfan I	0.05	mg/kg	-	-	< 0.05	-
Endosulfan II	0.05	mg/kg	-	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05	-
Endrin	0.05	mg/kg	-	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	-	-	< 0.05	-
Endrin ketone	0.05	mg/kg	-	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	-	-	< 0.05	-
Heptachlor	0.05	mg/kg	-	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	-	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	-
Methoxychlor	0.2	mg/kg	-	-	< 0.2	-
Toxaphene	1	mg/kg	-	-	< 1	-
Dibutylchloroendate (surr.)	1	%	-	-	106	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	107	-
<b>Nitrobenzene</b>						
	0.5	mg/kg	-	-	< 0.5	-
<b>Organophosphorus Pesticides</b>						
Azinphos-methyl	0.2	mg/kg	-	-	< 0.2	-
Bolstar	0.2	mg/kg	-	-	< 0.2	-
Chlorfenvinphos	0.2	mg/kg	-	-	< 0.2	-
Chlorpyrifos	0.2	mg/kg	-	-	< 0.2	-
Chlorpyrifos-methyl	0.2	mg/kg	-	-	< 0.2	-
Coumaphos	2	mg/kg	-	-	< 2	-
Demeton-S	0.2	mg/kg	-	-	< 0.2	-
Demeton-O	0.2	mg/kg	-	-	< 0.2	-
Diazinon	0.2	mg/kg	-	-	< 0.2	-
Dichlorvos	0.2	mg/kg	-	-	< 0.2	-
Dimethoate	0.2	mg/kg	-	-	< 0.2	-
Disulfoton	0.2	mg/kg	-	-	< 0.2	-
EPN	0.2	mg/kg	-	-	< 0.2	-
Ethion	0.2	mg/kg	-	-	< 0.2	-
Ethoprop	0.2	mg/kg	-	-	< 0.2	-
Ethyl parathion	0.2	mg/kg	-	-	< 0.2	-
Fenitrothion	0.2	mg/kg	-	-	< 0.2	-
Fensulfthion	0.2	mg/kg	-	-	< 0.2	-
Fenthion	0.2	mg/kg	-	-	< 0.2	-
Malathion	0.2	mg/kg	-	-	< 0.2	-
Merphos	0.2	mg/kg	-	-	< 0.2	-
Methyl parathion	0.2	mg/kg	-	-	< 0.2	-
Mevinphos	0.2	mg/kg	-	-	< 0.2	-

Client Sample ID			TP11_0.2	TP11_0.7	TP12_0.1	TP12_2.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29548	S17-Ma29549	S17-Ma29551	S17-Ma29552
Date Sampled			Mar 24, 2017	Mar 24, 2017	Mar 24, 2017	Mar 24, 2017
Test/Reference	LOR	Unit				
<b>Organophosphorus Pesticides</b>						
Monocrotophos	2	mg/kg	-	-	< 2	-
Omethoate	2	mg/kg	-	-	< 2	-
Phorate	0.2	mg/kg	-	-	< 0.2	-
Pirimiphos-methyl	0.2	mg/kg	-	-	< 0.2	-
Pyrazophos	0.2	mg/kg	-	-	< 0.2	-
Ronnel	0.2	mg/kg	-	-	< 0.2	-
Terbufos	0.2	mg/kg	-	-	< 0.2	-
Tetrachlorvinphos	0.2	mg/kg	-	-	< 0.2	-
Tokuthion	0.2	mg/kg	-	-	< 0.2	-
Trichloronate	0.2	mg/kg	-	-	< 0.2	-
Triphenylphosphate (surr.)	1	%	-	-	135	-
<b>Acid Herbicides</b>						
2,4-D	0.5	mg/kg	-	-	< 0.5	-
2,4-DB	0.5	mg/kg	-	-	< 0.5	-
2,4,5-T	0.5	mg/kg	-	-	< 0.5	-
2,4,5-TP	0.5	mg/kg	-	-	< 0.5	-
Actril (loxynil)	0.5	mg/kg	-	-	< 0.5	-
Dicamba	0.5	mg/kg	-	-	< 0.5	-
Dichlorprop	0.5	mg/kg	-	-	< 0.5	-
Dinitro-o-cresol	0.5	mg/kg	-	-	< 0.5	-
Dinoseb	0.5	mg/kg	-	-	< 0.5	-
MCPA	0.5	mg/kg	-	-	< 0.5	-
MCPB	0.5	mg/kg	-	-	< 0.5	-
Mecoprop	0.5	mg/kg	-	-	< 0.5	-
Warfarin (surr.)	1	%	-	-	100	-
<b>Phenols (Halogenated)</b>						
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	1.0	mg/kg	-	-	< 1	-
2,6-Dichlorophenol	0.5	mg/kg	-	-	< 0.5	-
4-Chloro-3-methylphenol	1.0	mg/kg	-	-	< 1	-
Pentachlorophenol	1.0	mg/kg	-	-	< 1	-
Tetrachlorophenols - Total	1.0	mg/kg	-	-	< 1	-
Total Halogenated Phenol*	1	mg/kg	-	-	< 1	-
<b>Phenols (non-Halogenated)</b>						
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	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	-
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	-

Client Sample ID			TP11_0.2	TP11_0.7	TP12_0.1	TP12_2.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29548	S17-Ma29549	S17-Ma29551	S17-Ma29552
Date Sampled			Mar 24, 2017	Mar 24, 2017	Mar 24, 2017	Mar 24, 2017
Test/Reference	LOR	Unit				
<b>Phthalates</b>						
Bis(2-ethylhexyl)phthalate	5	mg/kg	-	-	< 5	-
Butyl benzyl phthalate	0.5	mg/kg	-	-	< 0.5	-
Di-n-butyl phthalate	0.5	mg/kg	-	-	< 0.5	-
Di-n-octyl phthalate	0.5	mg/kg	-	-	< 0.5	-
Diethyl phthalate	0.5	mg/kg	-	-	< 0.5	-
Dimethyl phthalate	0.5	mg/kg	-	-	< 0.5	-
Nitrobenzene-d5 (surr.)	1	%	-	-	86	-
p-Terphenyl-d14 (surr.)	1	%	-	-	117	-
2-Fluorobiphenyl (surr.)	1	%	-	-	97	-
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	54
TRH >C16-C34	100	mg/kg	360	210	< 100	160
TRH >C34-C40	100	mg/kg	170	< 100	< 100	< 100
<b>Semivolatile Organic Compounds (SVOC)</b>						
2,4-Dinitrotoluene	1	mg/kg	-	-	< 2.5	-
<b>Heavy Metals</b>						
Chromium (hexavalent)	1	mg/kg	-	-	< 1	-
Conductivity (1:5 aqueous extract at 25°C)	5	uS/cm	23	270	-	220
Cyanide (free)	5	mg/kg	-	-	< 5	-
Cyanide (total)	5	mg/kg	-	-	< 5	-
Fluoride	100	mg/kg	-	-	210	-
pH (1:5 Aqueous extract)	0.1	pH Units	7.8	7.4	-	7.0
% Moisture	1	%	16	15	18	19
Arsenic	2	mg/kg	2.3	2.7	6.7	< 2
Beryllium	2	mg/kg	-	-	< 2	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	6.6	7.7	-	< 5
Copper	5	mg/kg	< 5	28	-	14
Lead	5	mg/kg	9.1	120	19	13
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	-	-	< 5	-
Nickel	5	mg/kg	< 5	< 5	9.5	9.1
Selenium	2	mg/kg	-	-	4.0	-
Silver	0.2	mg/kg	-	-	< 0.2	-
Zinc	5	mg/kg	19	240	-	40

Client Sample ID			TP13_0.1	TP13_1.2	TP14_0.2	TP14_1.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29554	S17-Ma29555	S17-Ma29557	S17-Ma29558
Date Sampled			Mar 24, 2017	Mar 24, 2017	Mar 24, 2017	Mar 24, 2017
Test/Reference	LOR	Unit				
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	24	< 20	27	< 20
TRH C15-C28	50	mg/kg	< 50	73	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	61	62	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	134	89	< 50

Client Sample ID			TP13_0.1	TP13_1.2	TP14_0.2	TP14_1.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29554	S17-Ma29555	S17-Ma29557	S17-Ma29558
Date Sampled			Mar 24, 2017	Mar 24, 2017	Mar 24, 2017	Mar 24, 2017
Test/Reference	LOR	Unit				
<b>BTEX</b>						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	72	72	75	60
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>						
Naphthalene <sup>N02</sup>	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2) <sup>N01</sup>	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) <sup>N04</sup>	20	mg/kg	< 20	< 20	< 20	< 20
<b>Polycyclic Aromatic Hydrocarbons</b>						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene <sup>N07</sup>	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	93	102	97	91
p-Terphenyl-d14 (surr.)	1	%	106	101	111	106
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
<b>Physical Properties</b>						
Conductivity (1:5 aqueous extract at 25°C)	5	uS/cm	160	210	190	190
pH (1:5 Aqueous extract)	0.1	pH Units	7.8	6.5	8.7	6.9
% Moisture	1	%	18	17	14	15
<b>Heavy Metals</b>						
Arsenic	2	mg/kg	8.1	3.8	4.0	2.3
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	13	6.6	8.0	< 5
Copper	5	mg/kg	26	11	53	7.0
Lead	5	mg/kg	17	28	12	11

<b>Client Sample ID</b>			<b>TP13_0.1</b>	<b>TP13_1.2</b>	<b>TP14_0.2</b>	<b>TP14_1.4</b>
<b>Sample Matrix</b>			<b>Soil</b>	<b>Soil</b>	<b>Soil</b>	<b>Soil</b>
<b>Eurofins   mgt Sample No.</b>			<b>S17-Ma29554</b>	<b>S17-Ma29555</b>	<b>S17-Ma29557</b>	<b>S17-Ma29558</b>
<b>Date Sampled</b>			<b>Mar 24, 2017</b>	<b>Mar 24, 2017</b>	<b>Mar 24, 2017</b>	<b>Mar 24, 2017</b>
Test/Reference	LOR	Unit				
<b>Heavy Metals</b>						
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	17	< 5	12	< 5
Zinc	5	mg/kg	55	93	37	< 5

<b>Client Sample ID</b>			<b>TP15_0.1</b>	<b>TP15_2.0</b>	<b>TP15_3.5</b>	<b>TP16_0.2</b>
<b>Sample Matrix</b>			<b>Soil</b>	<b>Soil</b>	<b>Soil</b>	<b>Soil</b>
<b>Eurofins   mgt Sample No.</b>			<b>S17-Ma29562</b>	<b>S17-Ma29563</b>	<b>S17-Ma29564</b>	<b>S17-Ma29565</b>
<b>Date Sampled</b>			<b>Mar 25, 2017</b>	<b>Mar 25, 2017</b>	<b>Mar 25, 2017</b>	<b>Mar 25, 2017</b>
Test/Reference	LOR	Unit				
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	35	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	66	100	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	120	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	101	220	< 50	< 50
<b>BTEX</b>						
Benzene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	-	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	57	73	76
<b>Volatile Organics</b>						
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	-	-	-

Client Sample ID			TP15_0.1	TP15_2.0	TP15_3.5	TP16_0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29562	S17-Ma29563	S17-Ma29564	S17-Ma29565
Date Sampled			Mar 25, 2017	Mar 25, 2017	Mar 25, 2017	Mar 25, 2017
Test/Reference	LOR	Unit				
<b>Volatile Organics</b>						
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	-	-	-
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	-	-	-
Fluorobenzene (surr.)	1	%	100	-	-	-
4-Bromofluorobenzene (surr.)	1	%	103	-	-	-
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>						
Naphthalene <sup>N02</sup>	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2) <sup>N01</sup>	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) <sup>N04</sup>	20	mg/kg	< 20	< 20	< 20	< 20
<b>Polycyclic Aromatic Hydrocarbons</b>						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	1.9	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	2.2	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	2.4	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	1.3	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	1.4	< 0.5	< 0.5
Benzo(b&j)fluoranthene <sup>N07</sup>	0.5	mg/kg	< 0.5	1.7	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	1.2	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	0.8	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	1.1	< 0.5	< 0.5

Client Sample ID			TP15_0.1	TP15_2.0	TP15_3.5	TP16_0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29562	S17-Ma29563	S17-Ma29564	S17-Ma29565
Date Sampled			Mar 25, 2017	Mar 25, 2017	Mar 25, 2017	Mar 25, 2017
Test/Reference	LOR	Unit				
<b>Polycyclic Aromatic Hydrocarbons</b>						
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	2.3	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	1.0	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	0.6	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	2.3	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	13.7	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	94	90	85	91
p-Terphenyl-d14 (surr.)	1	%	111	104	98	109
<b>Organochlorine Pesticides</b>						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	-
a-BHC	0.05	mg/kg	< 0.05	-	-	-
Aldrin	0.05	mg/kg	< 0.05	-	-	-
b-BHC	0.05	mg/kg	< 0.05	-	-	-
d-BHC	0.05	mg/kg	< 0.05	-	-	-
Dieldrin	0.05	mg/kg	< 0.05	-	-	-
Endosulfan I	0.05	mg/kg	< 0.05	-	-	-
Endosulfan II	0.05	mg/kg	< 0.05	-	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	-
Endrin	0.05	mg/kg	< 0.05	-	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	-
Endrin ketone	0.05	mg/kg	< 0.05	-	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	-
Heptachlor	0.05	mg/kg	< 0.05	-	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	-
Methoxychlor	0.2	mg/kg	< 0.2	-	-	-
Toxaphene	1	mg/kg	< 1	-	-	-
Dibutylchloroendate (surr.)	1	%	110	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	118	-	-	-
Nitrobenzene	0.5	mg/kg	< 0.5	-	-	-
<b>Organophosphorus Pesticides</b>						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	-	-
Bolstar	0.2	mg/kg	< 0.2	-	-	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	-	-
Chlorpyrifos	0.2	mg/kg	< 0.2	-	-	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	-	-
Coumaphos	2	mg/kg	< 2	-	-	-
Demeton-S	0.2	mg/kg	< 0.2	-	-	-
Demeton-O	0.2	mg/kg	< 0.2	-	-	-
Diazinon	0.2	mg/kg	< 0.2	-	-	-
Dichlorvos	0.2	mg/kg	< 0.2	-	-	-
Dimethoate	0.2	mg/kg	< 0.2	-	-	-
Disulfoton	0.2	mg/kg	< 0.2	-	-	-

Client Sample ID			TP15_0.1	TP15_2.0	TP15_3.5	TP16_0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29562	S17-Ma29563	S17-Ma29564	S17-Ma29565
Date Sampled			Mar 25, 2017	Mar 25, 2017	Mar 25, 2017	Mar 25, 2017
Test/Reference	LOR	Unit				
<b>Organophosphorus Pesticides</b>						
EPN	0.2	mg/kg	< 0.2	-	-	-
Ethion	0.2	mg/kg	< 0.2	-	-	-
Ethoprop	0.2	mg/kg	< 0.2	-	-	-
Ethyl parathion	0.2	mg/kg	< 0.2	-	-	-
Fenitrothion	0.2	mg/kg	< 0.2	-	-	-
Fensulfothion	0.2	mg/kg	< 0.2	-	-	-
Fenthion	0.2	mg/kg	< 0.2	-	-	-
Malathion	0.2	mg/kg	< 0.2	-	-	-
Merphos	0.2	mg/kg	< 0.2	-	-	-
Methyl parathion	0.2	mg/kg	< 0.2	-	-	-
Mevinphos	0.2	mg/kg	< 0.2	-	-	-
Monocrotophos	2	mg/kg	< 2	-	-	-
Omethoate	2	mg/kg	< 2	-	-	-
Phorate	0.2	mg/kg	< 0.2	-	-	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	-	-
Pyrazophos	0.2	mg/kg	< 0.2	-	-	-
Ronnel	0.2	mg/kg	< 0.2	-	-	-
Terbufos	0.2	mg/kg	< 0.2	-	-	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	-	-
Tokuthion	0.2	mg/kg	< 0.2	-	-	-
Trichloronate	0.2	mg/kg	< 0.2	-	-	-
Triphenylphosphate (surr.)	1	%	130	-	-	-
<b>Acid Herbicides</b>						
2.4-D	0.5	mg/kg	< 0.5	-	-	-
2.4-DB	0.5	mg/kg	< 0.5	-	-	-
2.4.5-T	0.5	mg/kg	< 0.5	-	-	-
2.4.5-TP	0.5	mg/kg	< 0.5	-	-	-
Actril (loxynil)	0.5	mg/kg	< 0.5	-	-	-
Dicamba	0.5	mg/kg	< 0.5	-	-	-
Dichlorprop	0.5	mg/kg	< 0.5	-	-	-
Dinitro-o-cresol	0.5	mg/kg	< 0.5	-	-	-
Dinoseb	0.5	mg/kg	< 0.5	-	-	-
MCPA	0.5	mg/kg	< 0.5	-	-	-
MCPB	0.5	mg/kg	< 0.5	-	-	-
Mecoprop	0.5	mg/kg	< 0.5	-	-	-
Warfarin (surr.)	1	%	106	-	-	-
<b>Phenols (Halogenated)</b>						
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	1.0	mg/kg	< 1	-	-	-
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	-
4-Chloro-3-methylphenol	1.0	mg/kg	< 1	-	-	-
Pentachlorophenol	1.0	mg/kg	< 1	-	-	-
Tetrachlorophenols - Total	1.0	mg/kg	< 1	-	-	-
Total Halogenated Phenol*	1	mg/kg	< 1	-	-	-

Client Sample ID			TP15_0.1	TP15_2.0	TP15_3.5	TP16_0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29562	S17-Ma29563	S17-Ma29564	S17-Ma29565
Date Sampled			Mar 25, 2017	Mar 25, 2017	Mar 25, 2017	Mar 25, 2017
Test/Reference	LOR	Unit				
<b>Phenols (non-Halogenated)</b>						
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	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	-	-	-
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	-	-	-
<b>Phthalates</b>						
Bis(2-ethylhexyl)phthalate	5	mg/kg	< 5	-	-	-
Butyl benzyl phthalate	0.5	mg/kg	< 0.5	-	-	-
Di-n-butyl phthalate	0.5	mg/kg	< 0.5	-	-	-
Di-n-octyl phthalate	0.5	mg/kg	< 0.5	-	-	-
Diethyl phthalate	0.5	mg/kg	< 0.5	-	-	-
Dimethyl phthalate	0.5	mg/kg	< 0.5	-	-	-
Nitrobenzene-d5 (surr.)	1	%	87	-	-	-
p-Terphenyl-d14 (surr.)	1	%	111	-	-	-
2-Fluorobiphenyl (surr.)	1	%	94	-	-	-
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	170	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
<b>Semivolatile Organic Compounds (SVOC)</b>						
2.4-Dinitrotoluene	1	mg/kg	< 2.5	-	-	-
<b>Other Parameters</b>						
Chromium (hexavalent)	1	mg/kg	< 1	-	-	-
Conductivity (1:5 aqueous extract at 25°C)	5	uS/cm	-	74	110	230
Cyanide (free)	5	mg/kg	< 5	-	-	-
Cyanide (total)	5	mg/kg	< 5	-	-	-
Fluoride	100	mg/kg	140	-	-	-
pH (1:5 Aqueous extract)	0.1	pH Units	-	6.7	7.1	8.0
% Moisture	1	%	18	15	17	22
<b>Heavy Metals</b>						
Arsenic	2	mg/kg	7.7	13	5.8	5.4
Beryllium	2	mg/kg	< 2	-	-	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	-	10	9.8	18
Copper	5	mg/kg	-	30	15	25
Lead	5	mg/kg	20	270	16	21
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	-	-	-
Nickel	5	mg/kg	9.7	< 5	5.4	21
Selenium	2	mg/kg	< 2	-	-	-
Silver	0.2	mg/kg	< 0.2	-	-	-
Zinc	5	mg/kg	-	280	17	70

Client Sample ID			TP16_1.0	TP17_0.2	TP17_3.5	TP18_0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29566	S17-Ma29567	S17-Ma29569	S17-Ma29571
Date Sampled			Mar 25, 2017	Mar 25, 2017	Mar 25, 2017	Mar 25, 2017
Test/Reference	LOR	Unit				
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	24	< 20	26	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	54	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	80	< 50
<b>BTEX</b>						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	90	72	76	75
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>						
Naphthalene <sup>N02</sup>	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2) <sup>N01</sup>	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) <sup>N04</sup>	20	mg/kg	< 20	< 20	< 20	< 20
<b>Polycyclic Aromatic Hydrocarbons</b>						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene <sup>N07</sup>	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	1.0	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	1.0	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	2	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	72	61	63	62
p-Terphenyl-d14 (surr.)	1	%	100	91	88	94
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
<b>Conductivity (1:5 aqueous extract at 25°C)</b>						
Conductivity (1:5 aqueous extract at 25°C)	5	uS/cm	160	330	83	130
<b>pH (1:5 Aqueous extract)</b>						
pH (1:5 Aqueous extract)	0.1	pH Units	4.9	8.1	6.6	8.4
<b>% Moisture</b>						
% Moisture	1	%	23	19	18	8.9

Client Sample ID			TP16_1.0	TP17_0.2	TP17_3.5	TP18_0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29566	S17-Ma29567	S17-Ma29569	S17-Ma29571
Date Sampled			Mar 25, 2017	Mar 25, 2017	Mar 25, 2017	Mar 25, 2017
Test/Reference	LOR	Unit				
<b>Heavy Metals</b>						
Arsenic	2	mg/kg	5.1	4.6	4.8	2.3
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	8.9	15	10	7.1
Copper	5	mg/kg	10	19	26	6.4
Lead	5	mg/kg	9.6	20	35	17
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	16	10	< 5
Zinc	5	mg/kg	15	52	65	22

Client Sample ID			TP18_2.5	QC01_250317	QC03_250317	TP19_0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29572	S17-Ma29573	S17-Ma29574	S17-Ma29575
Date Sampled			Mar 25, 2017	Mar 25, 2017	Mar 25, 2017	Mar 25, 2017
Test/Reference	LOR	Unit				
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	23	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
<b>BTEX</b>						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	72	71	74	78
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>						
Naphthalene <sup>N02</sup>	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2) <sup>N01</sup>	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) <sup>N04</sup>	20	mg/kg	< 20	< 20	< 20	< 20
<b>Polycyclic Aromatic Hydrocarbons</b>						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene <sup>N07</sup>	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			TP18_2.5	QC01_250317	QC03_250317	TP19_0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			S17-Ma29572	S17-Ma29573	S17-Ma29574	S17-Ma29575
Date Sampled			Mar 25, 2017	Mar 25, 2017	Mar 25, 2017	Mar 25, 2017
Test/Reference	LOR	Unit				
<b>Polycyclic Aromatic Hydrocarbons</b>						
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	66	67	72	70
p-Terphenyl-d14 (surr.)	1	%	95	101	97	111
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
<b>Conductivity (1:5 aqueous extract at 25°C)</b>						
	5	uS/cm	320	160	170	300
<b>pH (1:5 Aqueous extract)</b>						
	0.1	pH Units	7.7	8.6	6.9	8.3
<b>% Moisture</b>						
	1	%	17	8.3	21	16
<b>Heavy Metals</b>						
Arsenic	2	mg/kg	5.3	2.8	7.4	9.3
Cadmium	0.4	mg/kg	< 0.4	< 0.4	0.6	< 0.4
Chromium	5	mg/kg	19	9.2	20	16
Copper	5	mg/kg	13	11	37	16
Lead	5	mg/kg	22	25	60	21
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	7.1	5.9	12	11
Zinc	5	mg/kg	26	35	87	35

Client Sample ID			TP19_3.5
Sample Matrix			Soil
Eurofins   mgt Sample No.			S17-Ma29576
Date Sampled			Mar 25, 2017
Test/Reference	LOR	Unit	
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	28
TRH C15-C28	50	mg/kg	< 50
TRH C29-C36	50	mg/kg	< 50
TRH C10-36 (Total)	50	mg/kg	< 50
<b>BTEX</b>			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	72

<b>Client Sample ID</b>			<b>TP19_3.5</b>
<b>Sample Matrix</b>			<b>Soil</b>
<b>Eurofins   mgt Sample No.</b>			<b>S17-Ma29576</b>
<b>Date Sampled</b>			<b>Mar 25, 2017</b>
Test/Reference	LOR	Unit	
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>			
Naphthalene <sup>N02</sup>	0.5	mg/kg	< 0.5
TRH >C10-C16 less Naphthalene (F2) <sup>N01</sup>	50	mg/kg	< 50
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1) <sup>N04</sup>	20	mg/kg	< 20
<b>Polycyclic Aromatic Hydrocarbons</b>			
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 <sup>N07</sup>	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	%	69
p-Terphenyl-d14 (surr.)	1	%	106
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>			
TRH >C10-C16	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
<b>Conductivity (1:5 aqueous extract at 25°C)</b>			
	5	uS/cm	95
<b>pH (1:5 Aqueous extract)</b>			
	0.1	pH Units	7.1
<b>% Moisture</b>			
	1	%	19
<b>Heavy Metals</b>			
Arsenic	2	mg/kg	3.9
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	22
Copper	5	mg/kg	38
Lead	5	mg/kg	20
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	46
Zinc	5	mg/kg	51

## 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 (regarding both quality and NATA accreditation).

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
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: TRH C6-C36 - LTM-ORG-2010	Sydney	Mar 28, 2017	14 Day
BTEX - Method: TRH C6-C40 - LTM-ORG-2010	Sydney	Mar 28, 2017	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Sydney	Mar 28, 2017	14 Day
NSW DECC - Waste Classification Table 1			
Volatile Organics - Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices	Sydney	Mar 28, 2017	7 Days
Polycyclic Aromatic Hydrocarbons - Method: E007 Polyaromatic Hydrocarbons (PAH)	Sydney	Mar 28, 2017	14 Day
Organochlorine Pesticides - Method: LTM-ORG-2220 OCP & PCB in Soil and Water	Sydney	Mar 28, 2017	14 Day
Nitrobenzene - Method: E017 Semivolatile Organic Compounds	Sydney	Mar 28, 2017	14 Day
Organophosphorus Pesticides - Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS	Sydney	Mar 28, 2017	14 Day
Acid Herbicides - Method: LTM-ORG-2180 Phenoxy Acid Herbicides	Melbourne	Mar 29, 2017	14 Day
Phenols (Halogenated)	Sydney	Mar 28, 2017	0 Day
Phenols (non-Halogenated)	Sydney	Mar 28, 2017	0 Day
Phthalates - Method: E017 Phthalates	Sydney	Mar 28, 2017	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Sydney	Mar 28, 2017	14 Day
Semivolatile Organic Compounds (SVOC) - Method: E017 Semivolatile Organic Compounds (SVOC)	Sydney	Mar 28, 2017	14 Day
Chromium (hexavalent) - Method: E043 /E057 Total Speciated Chromium	Sydney	Apr 03, 2017	28 Day
Cyanide (total) - Method: LTM-INO-4020 Total Free WAD Cyanide by CFA	Melbourne	Mar 29, 2017	14 Day
Fluoride - Method: NEPC 404 (Fusion followed by ISE)	Melbourne	Mar 29, 2017	28 Day
DECC Metals : Metals M9DECC - Method: LTM-MET-3040_R0 TOTAL AND DISSOLVED METALS AND MERCURY IN WATERS BY ICP-MS	Sydney	Mar 28, 2017	28 Day
ENM Exemption Suite -The excavated natural material order 2014 NSW EPA(excluding Foreign Material)			
Conductivity (1:5 aqueous extract at 25°C) - Method: LTM-INO-4030	Sydney	Mar 29, 2017	7 Day
pH (1:5 Aqueous extract) - Method: LTM-GEN-7090 pH in soil by ISE	Sydney	Mar 29, 2017	7 Day
Metals M8 - Method: LTM-MET-3040_R0 TOTAL AND DISSOLVED METALS AND MERCURY IN WATERS BY ICP-MS	Sydney	Mar 28, 2017	28 Day
% Moisture - Method: LTM-GEN-7080 Moisture	Sydney	Mar 27, 2017	14 Day

**Company Name:** DRC Environmental Pty Ltd  
**Address:** Suite G6/79-109 Manningham Rd  
Bulleen  
VIC 3105  
**Project Name:** DUNHEVED CIRCUIT  
**Project ID:** ST MARYS

**Order No.:**  
**Report #:** 539755  
**Phone:** 0402 455 638  
**Fax:**

**Received:** Mar 27, 2017 11:20 AM  
**Due:** Apr 3, 2017  
**Priority:** 5 Day  
**Contact Name:** Patrick Baldwin

**Eurofins | mgt Analytical Services Manager : Mary Makarios**

Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	Moisture Set	ENM Exemption Suite -The excavated natural material order 2014 NSW	NSW DECC - Waste Classification Table 1	BTEX and Volatile TRH
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>													X	
<b>Sydney Laboratory - NATA Site # 18217</b>						X	X	X	X	X	X	X	X	X
<b>Brisbane Laboratory - NATA Site # 20794</b>														
<b>Perth Laboratory - NATA Site # 18217</b>														
<b>External Laboratory</b>														
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID									
1	TP01_0.1	Mar 24, 2017		Soil	S17-Ma29521		X				X	X		
2	TP01_0.7	Mar 24, 2017		Soil	S17-Ma29522						X	X		
3	TP01_1.6	Mar 24, 2017		Soil	S17-Ma29523					X				
4	TP02_0.05	Mar 24, 2017		Soil	S17-Ma29524	X					X		X	
5	TP02_1.2	Mar 24, 2017		Soil	S17-Ma29527						X	X		
6	TP03_0.1	Mar 24, 2017		Soil	S17-Ma29528		X				X	X		
7	TP03_1.0	Mar 24, 2017		Soil	S17-Ma29529					X				
8	TP03_1.2	Mar 24, 2017		Soil	S17-Ma29530						X	X		
9	TP04_0.6	Mar 24, 2017		Soil	S17-Ma29531						X	X		

<b>Company Name:</b>	DRC Environmental Pty Ltd	<b>Order No.:</b>		<b>Received:</b>	Mar 27, 2017 11:20 AM
<b>Address:</b>	Suite G6/79-109 Manningham Rd Bulleen VIC 3105	<b>Report #:</b>	539755	<b>Due:</b>	Apr 3, 2017
<b>Project Name:</b>	DUNHEVED CIRCUIT	<b>Phone:</b>	0402 455 638	<b>Priority:</b>	5 Day
<b>Project ID:</b>	ST MARYS	<b>Fax:</b>		<b>Contact Name:</b>	Patrick Baldwin

**Eurofins | mgt Analytical Services Manager : Mary Makarios**

Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	Moisture Set	ENM Exemption Suite -The excavated natural material order 2014 NSW	NSW DECC - Waste Classification Table 1	BTEX and Volatile TRH
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>													X	
<b>Sydney Laboratory - NATA Site # 18217</b>						X	X	X	X	X	X	X	X	X
<b>Brisbane Laboratory - NATA Site # 20794</b>														
<b>Perth Laboratory - NATA Site # 18217</b>														
10	TP05_0.1	Mar 24, 2017		Soil	S17-Ma29532	X					X	X		
11	TP05_0.2	Mar 24, 2017		Soil	S17-Ma29533					X				
12	TP05_0.6	Mar 24, 2017		Soil	S17-Ma29534						X	X		
13	TP06_0.1	Mar 24, 2017		Soil	S17-Ma29535	X					X		X	
14	TP06_0.6	Mar 24, 2017		Soil	S17-Ma29536						X	X		
15	TP07_0.1	Mar 24, 2017		Soil	S17-Ma29537	X					X	X		
16	TP07_0.6	Mar 24, 2017		Soil	S17-Ma29538						X	X		
17	TP08_0.1	Mar 24, 2017		Soil	S17-Ma29539		X				X	X		
18	TP08_0.5	Mar 24, 2017		Soil	S17-Ma29540					X				
19	TP08_1.5	Mar 24, 2017		Soil	S17-Ma29541						X	X		
20	TP08_3.9	Mar 24, 2017		Soil	S17-Ma29542						X	X		
21	TP09_0.1	Mar 24, 2017		Soil	S17-Ma29543	X					X	X		

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**Eurofins | mgt Analytical Services Manager : Mary Makarios**

Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	Moisture Set	ENM Exemption Suite -The excavated natural material order 2014 NSW	NSW DECC - Waste Classification Table 1	BTEX and Volatile TRH
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>													X	
<b>Sydney Laboratory - NATA Site # 18217</b>						X	X	X	X	X	X	X	X	X
<b>Brisbane Laboratory - NATA Site # 20794</b>														
<b>Perth Laboratory - NATA Site # 18217</b>														
22	TP09_2.5	Mar 24, 2017		Soil	S17-Ma29544						X	X		
23	TP10_0.1	Mar 24, 2017		Soil	S17-Ma29545						X	X		
24	TP10_2.8	Mar 24, 2017		Soil	S17-Ma29546					X				
25	SS01	Mar 24, 2017		Soil	S17-Ma29547						X	X		
26	TP11_0.2	Mar 24, 2017		Soil	S17-Ma29548			X			X	X		
27	TP11_0.7	Mar 24, 2017		Soil	S17-Ma29549						X	X		
28	TP11_2.9	Mar 24, 2017		Soil	S17-Ma29550				X					
29	TP12_0.1	Mar 24, 2017		Soil	S17-Ma29551			X			X		X	
30	TP12_2.2	Mar 24, 2017		Soil	S17-Ma29552						X	X		
31	TP12_3.2	Mar 24, 2017		Soil	S17-Ma29553					X				
32	TP13_0.1	Mar 24, 2017		Soil	S17-Ma29554			X			X	X		
33	TP13_1.2	Mar 24, 2017		Soil	S17-Ma29555						X	X		

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Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	Moisture Set	ENM Exemption Suite -The excavated natural material order 2014 NSW	NSW DECC - Waste Classification Table 1	BTEX and Volatile TRH
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>													X	
<b>Sydney Laboratory - NATA Site # 18217</b>						X	X	X	X	X	X	X	X	X
<b>Brisbane Laboratory - NATA Site # 20794</b>														
<b>Perth Laboratory - NATA Site # 18217</b>														
34	TP13_2.9	Mar 24, 2017		Soil	S17-Ma29556					X				
35	TP14_0.2	Mar 24, 2017		Soil	S17-Ma29557	X					X	X		
36	TP14_1.4	Mar 24, 2017		Soil	S17-Ma29558						X	X		
37	TP14_2.9	Mar 24, 2017		Soil	S17-Ma29559					X				
38	TB01	Mar 24, 2017		Water	S17-Ma29560									X
39	TP15_0.1	Mar 25, 2017		Soil	S17-Ma29562			X			X		X	
40	TP15_2.0	Mar 25, 2017		Soil	S17-Ma29563						X	X		
41	TP15_3.5	Mar 25, 2017		Soil	S17-Ma29564						X	X		
42	TP16_0.2	Mar 25, 2017		Soil	S17-Ma29565			X			X	X		
43	TP16_1.0	Mar 25, 2017		Soil	S17-Ma29566						X	X		
44	TP17_0.2	Mar 25, 2017		Soil	S17-Ma29567			X			X	X		
45	TP17_1.5	Mar 25, 2017		Soil	S17-Ma29568					X				

<b>Company Name:</b> DRC Environmental Pty Ltd	<b>Order No.:</b>	<b>Received:</b> Mar 27, 2017 11:20 AM
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<b>Project Name:</b> DUNHEVED CIRCUIT	<b>Phone:</b> 0402 455 638	<b>Priority:</b> 5 Day
<b>Project ID:</b> ST MARYS	<b>Fax:</b>	<b>Contact Name:</b> Patrick Baldwin

**Eurofins | mgt Analytical Services Manager : Mary Makarios**

Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	Moisture Set	ENM Exemption Suite -The excavated natural material order 2014 NSW	NSW DECC - Waste Classification Table 1	BTEX and Volatile TRH
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>													X	
<b>Sydney Laboratory - NATA Site # 18217</b>						X	X	X	X	X	X	X	X	X
<b>Brisbane Laboratory - NATA Site # 20794</b>														
<b>Perth Laboratory - NATA Site # 18217</b>														
46	TP17_3.5	Mar 25, 2017		Soil	S17-Ma29569						X	X		
47	TP16_3.0	Mar 25, 2017		Soil	S17-Ma29570					X				
48	TP18_0.2	Mar 25, 2017		Soil	S17-Ma29571			X			X	X		
49	TP18_2.5	Mar 25, 2017		Soil	S17-Ma29572						X	X		
50	QC01_250317	Mar 25, 2017		Soil	S17-Ma29573			X			X	X		
51	QC03_250317	Mar 25, 2017		Soil	S17-Ma29574						X	X		
52	TP19_0.2	Mar 25, 2017		Soil	S17-Ma29575						X	X		
53	TP19_3.5	Mar 25, 2017		Soil	S17-Ma29576						X	X		
54	TB03_250317	Mar 25, 2017		Water	S17-Ma29577									X
55	TB04_250317	Mar 25, 2017		Water	S17-Ma29578									X
56	TP19	Mar 25, 2017		Other	S17-Ma29579			X						
<b>Test Counts</b>						6	3	9	1	10	41	37	4	3

## Internal Quality Control Review and Glossary

### General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. 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 Sample Receipt Advice.

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.

**\*\*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

<b>Dry</b>	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
<b>LOR</b>	Limit of Reporting.
<b>SPIKE</b>	Addition of the analyte to the sample and reported as percentage recovery.
<b>RPD</b>	Relative Percent Difference between two Duplicate pieces of analysis.
<b>LCS</b>	Laboratory Control Sample - reported as percent recovery
<b>CRM</b>	Certified Reference Material - reported as percent recovery
<b>Method Blank</b>	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
<b>Surr - Surrogate</b>	The addition of a like compound to the analyte target and reported as percentage recovery.
<b>Duplicate</b>	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
<b>Batch Duplicate</b>	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
<b>Batch SPIKE</b>	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
<b>USEPA</b>	United States Environmental Protection Agency
<b>APHA</b>	American Public Health Association
<b>TCLP</b>	Toxicity Characteristic Leaching Procedure
<b>COC</b>	Chain of Custody
<b>SRA</b>	Sample Receipt Advice
<b>CP</b>	Client Parent - QC was performed on samples pertaining to this report
<b>NCP</b>	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
<b>TEQ</b>	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 50-150%-Phenols & PFASs 20-130%

### 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
<b>Method Blank</b>						
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>						
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	
<b>Method Blank</b>						
<b>BTEX</b>						
Benzene	mg/kg	< 0.1		0.1	Pass	
Toluene	mg/kg	< 0.1		0.1	Pass	
Ethylbenzene	mg/kg	< 0.1		0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2		0.2	Pass	
o-Xylene	mg/kg	< 0.1		0.1	Pass	
Xylenes - Total	mg/kg	< 0.3		0.3	Pass	
<b>Method Blank</b>						
<b>Volatile Organics</b>						
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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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	
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	
<b>Method Blank</b>							
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
<b>Method Blank</b>							
<b>Polycyclic Aromatic Hydrocarbons</b>							
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	
<b>Method Blank</b>							
<b>Organochlorine Pesticides</b>							
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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin aldehyde	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	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
<b>Method Blank</b>							
Nitrobenzene	mg/kg	< 0.5			0.5	Pass	
<b>Method Blank</b>							
<b>Organophosphorus Pesticides</b>							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
<b>Method Blank</b>							
<b>Acid Herbicides</b>							
2.4-D	mg/kg	< 0.5			0.5	Pass	
2.4-DB	mg/kg	< 0.5			0.5	Pass	
2.4.5-T	mg/kg	< 0.5			0.5	Pass	
2.4.5-TP	mg/kg	< 0.5			0.5	Pass	
Actril (loxynil)	mg/kg	< 0.5			0.5	Pass	
Dicamba	mg/kg	< 0.5			0.5	Pass	
Dichlorprop	mg/kg	< 0.5			0.5	Pass	
Dinitro-o-cresol	mg/kg	< 0.5			0.5	Pass	
Dinoseb	mg/kg	< 0.5			0.5	Pass	
MCPA	mg/kg	< 0.5			0.5	Pass	
MCPB	mg/kg	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Mecoprop	mg/kg	< 0.5			0.5	Pass	
<b>Method Blank</b>							
<b>Phenols (Halogenated)</b>							
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			1.0	Pass	
2.6-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1.0	Pass	
Pentachlorophenol	mg/kg	< 1			1.0	Pass	
Tetrachlorophenols - Total	mg/kg	< 1			1.0	Pass	
<b>Method Blank</b>							
<b>Phenols (non-Halogenated)</b>							
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	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	
<b>Method Blank</b>							
<b>Phthalates</b>							
Bis(2-ethylhexyl)phthalate	mg/kg	< 5			5	Pass	
Butyl benzyl phthalate	mg/kg	< 0.5			0.5	Pass	
Di-n-butyl phthalate	mg/kg	< 0.5			0.5	Pass	
Di-n-octyl phthalate	mg/kg	< 0.5			0.5	Pass	
Diethyl phthalate	mg/kg	< 0.5			0.5	Pass	
Dimethyl phthalate	mg/kg	< 0.5			0.5	Pass	
<b>Method Blank</b>							
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>							
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
<b>Method Blank</b>							
<b>Semivolatile Organic Compounds (SVOC)</b>							
2.4-Dinitrotoluene	mg/kg	< 1			1	Pass	
<b>Method Blank</b>							
<b>Chromium (hexavalent)</b>							
Chromium (hexavalent)	mg/kg	< 1			1	Pass	
<b>Cyanide (free)</b>							
Cyanide (free)	mg/kg	< 5			5	Pass	
<b>Cyanide (total)</b>							
Cyanide (total)	mg/kg	< 5			5	Pass	
<b>Fluoride</b>							
Fluoride	mg/kg	< 100			100	Pass	
<b>Method Blank</b>							
<b>Heavy Metals</b>							
Arsenic	mg/kg	< 2			2	Pass	
Arsenic	mg/kg	< 2			2	Pass	
Beryllium	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Lead	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	
Silver	mg/kg	< 0.2			0.2	Pass	
Zinc	mg/kg	< 5			5	Pass	
<b>LCS - % Recovery</b>							
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>							
TRH C6-C9	%	81			70-130	Pass	
TRH C10-C14	%	94			70-130	Pass	
<b>LCS - % Recovery</b>							
<b>BTEX</b>							
Benzene	%	90			70-130	Pass	
Toluene	%	90			70-130	Pass	
Ethylbenzene	%	92			70-130	Pass	
m&p-Xylenes	%	88			70-130	Pass	
o-Xylene	%	87			70-130	Pass	
Xylenes - Total	%	88			70-130	Pass	
<b>LCS - % Recovery</b>							
<b>Volatile Organics</b>							
1.1-Dichloroethane	%	116			70-130	Pass	
1.1-Dichloroethene	%	111			70-130	Pass	
1.1.1-Trichloroethane	%	114			70-130	Pass	
1.1.1.2-Tetrachloroethane	%	112			70-130	Pass	
1.1.2-Trichloroethane	%	117			70-130	Pass	
1.1.2.2-Tetrachloroethane	%	123			70-130	Pass	
1.2-Dibromoethane	%	116			70-130	Pass	
1.2-Dichlorobenzene	%	118			70-130	Pass	
1.2-Dichloroethane	%	117			70-130	Pass	
1.2-Dichloropropane	%	114			70-130	Pass	
1.2.3-Trichloropropane	%	119			70-130	Pass	
1.2.4-Trimethylbenzene	%	111			70-130	Pass	
1.3-Dichlorobenzene	%	116			70-130	Pass	
1.3-Dichloropropane	%	118			70-130	Pass	
1.3.5-Trimethylbenzene	%	112			70-130	Pass	
1.4-Dichlorobenzene	%	116			70-130	Pass	
2-Propanone (Acetone)	%	126			70-130	Pass	
4-Chlorotoluene	%	112			70-130	Pass	
4-Methyl-2-pentanone (MIBK)	%	118			70-130	Pass	
Allyl chloride	%	112			70-130	Pass	
Benzene	%	117			70-130	Pass	
Bromobenzene	%	111			70-130	Pass	
Bromochloromethane	%	112			70-130	Pass	
Bromodichloromethane	%	111			70-130	Pass	
Bromoform	%	110			70-130	Pass	
Bromomethane	%	74			70-130	Pass	
Carbon disulfide	%	103			70-130	Pass	
Carbon Tetrachloride	%	112			70-130	Pass	
Chlorobenzene	%	116			70-130	Pass	
Chloroethane	%	108			70-130	Pass	
Chloroform	%	118			70-130	Pass	

Test	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
cis-1.2-Dichloroethene	%	117		70-130	Pass	
cis-1.3-Dichloropropene	%	112		70-130	Pass	
Dibromochloromethane	%	110		70-130	Pass	
Dibromomethane	%	117		70-130	Pass	
Dichlorodifluoromethane	%	93		70-130	Pass	
Ethylbenzene	%	113		70-130	Pass	
Iodomethane	%	105		70-130	Pass	
Isopropyl benzene (Cumene)	%	115		70-130	Pass	
m&p-Xylenes	%	114		70-130	Pass	
Methylene Chloride	%	101		70-130	Pass	
o-Xylene	%	115		70-130	Pass	
Styrene	%	116		70-130	Pass	
Tetrachloroethene	%	119		70-130	Pass	
Toluene	%	115		70-130	Pass	
trans-1.2-Dichloroethene	%	116		70-130	Pass	
trans-1.3-Dichloropropene	%	111		70-130	Pass	
Trichloroethene	%	117		70-130	Pass	
Trichlorofluoromethane	%	107		70-130	Pass	
Vinyl chloride	%	111		70-130	Pass	
Xylenes - Total	%	114		70-130	Pass	
<b>LCS - % Recovery</b>						
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>						
Naphthalene	%	113		70-130	Pass	
TRH C6-C10	%	80		70-130	Pass	
<b>LCS - % Recovery</b>						
<b>Polycyclic Aromatic Hydrocarbons</b>						
Acenaphthene	%	103		70-130	Pass	
Acenaphthylene	%	94		70-130	Pass	
Anthracene	%	114		70-130	Pass	
Benz(a)anthracene	%	81		70-130	Pass	
Benzo(a)pyrene	%	95		70-130	Pass	
Benzo(b&j)fluoranthene	%	86		70-130	Pass	
Benzo(g,h,i)perylene	%	111		70-130	Pass	
Benzo(k)fluoranthene	%	112		70-130	Pass	
Chrysene	%	114		70-130	Pass	
Dibenz(a,h)anthracene	%	106		70-130	Pass	
Fluoranthene	%	97		70-130	Pass	
Fluorene	%	103		70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	118		70-130	Pass	
Naphthalene	%	103		70-130	Pass	
Phenanthrene	%	92		70-130	Pass	
Pyrene	%	101		70-130	Pass	
<b>LCS - % Recovery</b>						
<b>Organochlorine Pesticides</b>						
Chlordanes - Total	%	106		70-130	Pass	
4.4'-DDD	%	117		70-130	Pass	
4.4'-DDE	%	108		70-130	Pass	
4.4'-DDT	%	117		70-130	Pass	
a-BHC	%	111		70-130	Pass	
Aldrin	%	108		70-130	Pass	
b-BHC	%	120		70-130	Pass	
d-BHC	%	128		70-130	Pass	
Dieldrin	%	112		70-130	Pass	
Endosulfan I	%	111		70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan II	%	114			70-130	Pass	
Endosulfan sulphate	%	114			70-130	Pass	
Endrin	%	115			70-130	Pass	
Endrin aldehyde	%	114			70-130	Pass	
Endrin ketone	%	110			70-130	Pass	
g-BHC (Lindane)	%	108			70-130	Pass	
Heptachlor	%	126			70-130	Pass	
Heptachlor epoxide	%	119			70-130	Pass	
Methoxychlor	%	111			70-130	Pass	
Toxaphene	%	119			70-130	Pass	
<b>LCS - % Recovery</b>							
<b>Acid Herbicides</b>							
2.4-D	%	101			70-130	Pass	
2.4-DB	%	85			70-130	Pass	
2.4.5-T	%	105			70-130	Pass	
2.4.5-TP	%	105			70-130	Pass	
Actril (loxynil)	%	87			70-130	Pass	
Dicamba	%	94			70-130	Pass	
Dichlorprop	%	99			70-130	Pass	
Dinitro-o-cresol	%	77			70-130	Pass	
Dinoseb	%	76			70-130	Pass	
MCPA	%	109			70-130	Pass	
MCPB	%	85			70-130	Pass	
Mecoprop	%	83			70-130	Pass	
<b>LCS - % Recovery</b>							
<b>Phenols (Halogenated)</b>							
2-Chlorophenol	%	92			30-130	Pass	
2.4-Dichlorophenol	%	78			30-130	Pass	
2.4.5-Trichlorophenol	%	94			30-130	Pass	
2.4.6-Trichlorophenol	%	109			30-130	Pass	
2.6-Dichlorophenol	%	102			30-130	Pass	
4-Chloro-3-methylphenol	%	70			30-130	Pass	
Tetrachlorophenols - Total	%	84			30-130	Pass	
<b>LCS - % Recovery</b>							
<b>Phenols (non-Halogenated)</b>							
2-Methylphenol (o-Cresol)	%	111			30-130	Pass	
2-Nitrophenol	%	92			30-130	Pass	
2.4-Dimethylphenol	%	91			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	103			30-130	Pass	
4-Nitrophenol	%	122			30-130	Pass	
Phenol	%	86			30-130	Pass	
<b>LCS - % Recovery</b>							
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>							
TRH >C10-C16	%	98			70-130	Pass	
<b>LCS - % Recovery</b>							
Chromium (hexavalent)	%	92			70-130	Pass	
Cyanide (total)	%	92			70-130	Pass	
Fluoride	%	102			70-130	Pass	
<b>LCS - % Recovery</b>							
<b>Heavy Metals</b>							
Arsenic	%	102			70-130	Pass	
Arsenic	%	101			70-130	Pass	
Beryllium	%	94			70-130	Pass	
Cadmium	%	100			70-130	Pass	

Test	Units	Result 1	Acceptance Limits	Pass Limits	Qualifying Code		
Cadmium	%	88	70-130	Pass			
Chromium	%	93	70-130	Pass			
Copper	%	96	70-130	Pass			
Lead	%	110	70-130	Pass			
Lead	%	101	70-130	Pass			
Mercury	%	100	70-130	Pass			
Mercury	%	89	70-130	Pass			
Molybdenum	%	78	70-130	Pass			
Nickel	%	95	70-130	Pass			
Nickel	%	94	70-130	Pass			
Selenium	%	93	70-130	Pass			
Silver	%	84	70-130	Pass			
Zinc	%	113	70-130	Pass			
Test	Lab Sample ID	QA Source	Units	Result 1	Acceptance Limits	Pass Limits	Qualifying Code
<b>Spike - % Recovery</b>							
<b>Organochlorine Pesticides</b>				Result 1			
Chlordanes - Total	S17-Ma28827	NCP	%	111	70-130	Pass	
4,4'-DDD	S17-Ma28863	NCP	%	110	70-130	Pass	
4,4'-DDE	S17-Ma28827	NCP	%	114	70-130	Pass	
4,4'-DDT	S17-Ma28863	NCP	%	109	70-130	Pass	
a-BHC	S17-Ma28827	NCP	%	118	70-130	Pass	
Aldrin	S17-Ma28827	NCP	%	117	70-130	Pass	
b-BHC	S17-Ma28827	NCP	%	124	70-130	Pass	
d-BHC	S17-Ma28827	NCP	%	124	70-130	Pass	
Dieldrin	S17-Ma28827	NCP	%	115	70-130	Pass	
Endosulfan I	S17-Ma28827	NCP	%	113	70-130	Pass	
Endosulfan II	S17-Ma28827	NCP	%	115	70-130	Pass	
Endosulfan sulphate	S17-Ma28827	NCP	%	113	70-130	Pass	
Endrin	S17-Ma28827	NCP	%	105	70-130	Pass	
Endrin aldehyde	S17-Ma28827	NCP	%	109	70-130	Pass	
Endrin ketone	S17-Ma28827	NCP	%	104	70-130	Pass	
g-BHC (Lindane)	S17-Ma28827	NCP	%	108	70-130	Pass	
Heptachlor	S17-Ma28827	NCP	%	110	70-130	Pass	
Heptachlor epoxide	S17-Ma28827	NCP	%	126	70-130	Pass	
Methoxychlor	S17-Ma28827	NCP	%	80	70-130	Pass	
<b>Spike - % Recovery</b>							
<b>Acid Herbicides</b>				Result 1			
2,4-D	S17-Ma29524	CP	%	114	70-130	Pass	
Actril (loxynil)	S17-Ma29524	CP	%	105	70-130	Pass	
Dichlorprop	S17-Ma29524	CP	%	112	70-130	Pass	
MCPA	S17-Ma29524	CP	%	130	70-130	Pass	
MCPB	S17-Ma29524	CP	%	104	70-130	Pass	
<b>Spike - % Recovery</b>							
<b>Heavy Metals</b>				Result 1			
Beryllium	S17-Ma22881	NCP	%	86	70-130	Pass	
Molybdenum	S17-Ma22881	NCP	%	89	70-130	Pass	
<b>Spike - % Recovery</b>							
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>				Result 1			
TRH C10-C14	S17-Ma29531	CP	%	97	70-130	Pass	
<b>Spike - % Recovery</b>							
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>				Result 1			
TRH >C10-C16	S17-Ma29531	CP	%	99	70-130	Pass	
<b>Spike - % Recovery</b>							
<b>Polycyclic Aromatic Hydrocarbons</b>				Result 1			

Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Acenaphthene	S17-Ma29535	CP	%	91		70-130	Pass	
<b>Spike - % Recovery</b>								
<b>Phenols (Halogenated)</b>				Result 1				
2-Chlorophenol	S17-Ma29535	CP	%	86		30-130	Pass	
4-Chloro-3-methylphenol	S17-Ma29535	CP	%	83		30-130	Pass	
<b>Spike - % Recovery</b>								
<b>Phenols (non-Halogenated)</b>				Result 1				
Phenol	S17-Ma29535	CP	%	78		30-130	Pass	
<b>Spike - % Recovery</b>								
				Result 1				
Cyanide (total)	M17-Ma30008	NCP	%	66		70-130	Fail	Q08
<b>Spike - % Recovery</b>								
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>				Result 1				
TRH C10-C14	S17-Ma29543	CP	%	81		70-130	Pass	
<b>Spike - % Recovery</b>								
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>				Result 1				
TRH >C10-C16	S17-Ma29543	CP	%	78		70-130	Pass	
<b>Spike - % Recovery</b>								
<b>Heavy Metals</b>				Result 1				
Arsenic	S17-Ma29544	CP	%	82		70-130	Pass	
Cadmium	S17-Ma29544	CP	%	87		70-130	Pass	
Chromium	S17-Ma29544	CP	%	91		70-130	Pass	
Copper	S17-Ma29544	CP	%	85		70-130	Pass	
Lead	S17-Ma29544	CP	%	130		70-130	Pass	
Mercury	S17-Ma29544	CP	%	95		70-130	Pass	
Nickel	S17-Ma29544	CP	%	88		70-130	Pass	
Selenium	S17-Ma29544	CP	%	95		70-130	Pass	
Silver	S17-Ma29544	CP	%	81		70-130	Pass	
<b>Spike - % Recovery</b>								
<b>Polycyclic Aromatic Hydrocarbons</b>				Result 1				
Acenaphthene	S17-Ma29548	CP	%	98		70-130	Pass	
Acenaphthylene	S17-Ma29548	CP	%	95		70-130	Pass	
Anthracene	S17-Ma29548	CP	%	86		70-130	Pass	
Benz(a)anthracene	S17-Ma29548	CP	%	83		70-130	Pass	
Benzo(a)pyrene	S17-Ma29548	CP	%	93		70-130	Pass	
Benzo(b&j)fluoranthene	S17-Ma29548	CP	%	96		70-130	Pass	
Benzo(g,h,i)perylene	S17-Ma29548	CP	%	111		70-130	Pass	
Benzo(k)fluoranthene	S17-Ma29548	CP	%	95		70-130	Pass	
Chrysene	S17-Ma29548	CP	%	105		70-130	Pass	
Dibenz(a,h)anthracene	S17-Ma29548	CP	%	104		70-130	Pass	
Fluoranthene	S17-Ma29548	CP	%	80		70-130	Pass	
Fluorene	S17-Ma29548	CP	%	92		70-130	Pass	
Indeno(1,2,3-cd)pyrene	S17-Ma29548	CP	%	115		70-130	Pass	
Naphthalene	S17-Ma29548	CP	%	98		70-130	Pass	
Phenanthrene	S17-Ma29548	CP	%	76		70-130	Pass	
Pyrene	S17-Ma29548	CP	%	81		70-130	Pass	
<b>Spike - % Recovery</b>								
<b>Phenols (Halogenated)</b>				Result 1				
2,4-Dichlorophenol	S17-Ma31745	NCP	%	75		30-130	Pass	
2,6-Dichlorophenol	S17-Ma31745	NCP	%	88		30-130	Pass	
Pentachlorophenol	S17-Ma31745	NCP	%	97		30-130	Pass	
<b>Spike - % Recovery</b>								
<b>Phenols (non-Halogenated)</b>				Result 1				
2-Methylphenol (o-Cresol)	S17-Ma31745	NCP	%	91		30-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
2-Nitrophenol	S17-Ma31745	NCP	%	85		30-130	Pass	
2,4-Dimethylphenol	S17-Ma31745	NCP	%	86		30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	S17-Ma31745	NCP	%	90		30-130	Pass	
4-Nitrophenol	S17-Ma31745	NCP	%	128		30-130	Pass	
<b>Spike - % Recovery</b>								
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>				Result 1				
TRH C6-C9	S17-Ma29552	CP	%	81		70-130	Pass	
<b>Spike - % Recovery</b>								
<b>BTEX</b>				Result 1				
Benzene	S17-Ma29552	CP	%	75		70-130	Pass	
Toluene	S17-Ma29552	CP	%	75		70-130	Pass	
Ethylbenzene	S17-Ma29552	CP	%	76		70-130	Pass	
m&p-Xylenes	S17-Ma29552	CP	%	74		70-130	Pass	
o-Xylene	S17-Ma29552	CP	%	73		70-130	Pass	
Xylenes - Total	S17-Ma29552	CP	%	74		70-130	Pass	
<b>Spike - % Recovery</b>								
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>				Result 1				
Naphthalene	S17-Ma29552	CP	%	70		70-130	Pass	
TRH C6-C10	S17-Ma29552	CP	%	86		70-130	Pass	
<b>Spike - % Recovery</b>								
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>				Result 1				
TRH C10-C14	S17-Ma29557	CP	%	86		70-130	Pass	
<b>Spike - % Recovery</b>								
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>				Result 1				
TRH >C10-C16	S17-Ma29557	CP	%	91		70-130	Pass	
<b>Spike - % Recovery</b>								
<b>Heavy Metals</b>				Result 1				
Arsenic	S17-Ma29558	CP	%	95		70-130	Pass	
Cadmium	S17-Ma29558	CP	%	81		70-130	Pass	
Chromium	S17-Ma29558	CP	%	100		70-130	Pass	
Copper	S17-Ma29558	CP	%	103		70-130	Pass	
Lead	S17-Ma29558	CP	%	114		70-130	Pass	
Mercury	S17-Ma29558	CP	%	85		70-130	Pass	
Nickel	S17-Ma29558	CP	%	93		70-130	Pass	
Selenium	S17-Ma29558	CP	%	89		70-130	Pass	
Silver	S17-Ma29558	CP	%	78		70-130	Pass	
Zinc	S17-Ma29558	CP	%	123		70-130	Pass	
<b>Spike - % Recovery</b>								
<b>Phenols (Halogenated)</b>				Result 1				
Tetrachlorophenols - Total	S17-Ma31075	NCP	%	109		30-130	Pass	
<b>Spike - % Recovery</b>								
<b>Phenols (non-Halogenated)</b>				Result 1				
2-Methyl-4,6-dinitrophenol	S17-Ma31075	NCP	%	72		30-130	Pass	
2,4-Dinitrophenol	S17-Ma31075	NCP	%	85		70-130	Pass	
<b>Spike - % Recovery</b>								
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>				Result 1				
TRH C6-C9	S17-Ma29567	CP	%	78		70-130	Pass	
<b>Spike - % Recovery</b>								
<b>BTEX</b>				Result 1				
Benzene	S17-Ma29567	CP	%	79		70-130	Pass	
Toluene	S17-Ma29567	CP	%	79		70-130	Pass	
Ethylbenzene	S17-Ma29567	CP	%	80		70-130	Pass	
m&p-Xylenes	S17-Ma29567	CP	%	78		70-130	Pass	
o-Xylene	S17-Ma29567	CP	%	78		70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Xylenes - Total	S17-Ma29567	CP	%	78			70-130	Pass	
<b>Spike - % Recovery</b>									
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>				Result 1					
Naphthalene	S17-Ma29567	CP	%	72			70-130	Pass	
TRH C6-C10	S17-Ma29567	CP	%	80			70-130	Pass	
<b>Spike - % Recovery</b>									
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>				Result 1					
TRH C10-C14	S17-Ma29572	CP	%	91			70-130	Pass	
<b>Spike - % Recovery</b>									
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>				Result 1					
TRH >C10-C16	S17-Ma29572	CP	%	97			70-130	Pass	
<b>Spike - % Recovery</b>									
<b>Polycyclic Aromatic Hydrocarbons</b>				Result 1					
Acenaphthene	S17-Ma29576	CP	%	86			70-130	Pass	
Acenaphthylene	S17-Ma29576	CP	%	84			70-130	Pass	
Anthracene	S17-Ma29576	CP	%	82			70-130	Pass	
Benz(a)anthracene	S17-Ma29576	CP	%	91			70-130	Pass	
Benzo(a)pyrene	S17-Ma29576	CP	%	88			70-130	Pass	
Benzo(b&j)fluoranthene	S17-Ma29576	CP	%	93			70-130	Pass	
Benzo(g,h,i)perylene	S17-Ma29576	CP	%	87			70-130	Pass	
Benzo(k)fluoranthene	S17-Ma29576	CP	%	100			70-130	Pass	
Chrysene	S17-Ma29576	CP	%	103			70-130	Pass	
Dibenz(a,h)anthracene	S17-Ma29576	CP	%	90			70-130	Pass	
Fluoranthene	S17-Ma29576	CP	%	99			70-130	Pass	
Fluorene	S17-Ma29576	CP	%	89			70-130	Pass	
Indeno(1,2,3-cd)pyrene	S17-Ma29576	CP	%	98			70-130	Pass	
Naphthalene	S17-Ma29576	CP	%	100			70-130	Pass	
Phenanthrene	S17-Ma29576	CP	%	75			70-130	Pass	
Pyrene	S17-Ma29576	CP	%	100			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
<b>Duplicate</b>									
<b>Organochlorine Pesticides</b>				Result 1	Result 2	RPD			
Chlordanes - Total	S17-Ma29444	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4,4'-DDD	S17-Ma29444	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4,4'-DDE	S17-Ma29444	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4,4'-DDT	S17-Ma29444	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S17-Ma29444	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S17-Ma29444	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S17-Ma29444	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S17-Ma29444	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S17-Ma29444	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S17-Ma29444	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S17-Ma29444	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S17-Ma29444	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S17-Ma29444	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S17-Ma29444	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S17-Ma29444	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S17-Ma29444	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S17-Ma29444	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S17-Ma29444	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S17-Ma29444	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S17-Ma29444	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S17-Ma29444	NCP	mg/kg	< 1	< 1	<1	30%	Pass	

Duplicate								
				Result 1	Result 2	RPD		
Nitrobenzene	S17-Ma29524	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Organophosphorus Pesticides				Result 1	Result 2	RPD		
Azinphos-methyl	S17-Ma29630	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Bolstar	S17-Ma29630	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Chlorfenvinphos	S17-Ma29630	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Chlorpyrifos	S17-Ma29630	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Chlorpyrifos-methyl	S17-Ma29630	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Coumaphos	S17-Ma29630	NCP	mg/kg	< 2	< 2	<1	30%	Pass
Demeton-S	S17-Ma29630	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Demeton-O	S17-Ma29630	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Diazinon	S17-Ma29630	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Dichlorvos	S17-Ma29630	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Dimethoate	S17-Ma29630	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Disulfoton	S17-Ma29630	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
EPN	S17-Ma29630	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Ethion	S17-Ma29630	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Ethoprop	S17-Ma29630	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Fenitrothion	S17-Ma29630	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Fensulfothion	S17-Ma29630	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Fenthion	S17-Ma29630	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Malathion	S17-Ma29630	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Merphos	S17-Ma29630	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Methyl parathion	S17-Ma29630	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Mevinphos	S17-Ma29630	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Monocrotophos	S17-Fe17214	NCP	mg/kg	< 2	< 2	<1	30%	Pass
Omethoate	S17-Ma29630	NCP	mg/kg	< 2	< 2	<1	30%	Pass
Phorate	S17-Ma29630	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Pirimiphos-methyl	S17-Ma29630	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Pyrazophos	S17-Ma29630	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Ronnel	S17-Ma29630	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Terbufos	S17-Ma29630	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Trichloronate	S17-Ma29630	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Duplicate								
Acid Herbicides				Result 1	Result 2	RPD		
2.4-D	M17-Ma29952	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
2.4-DB	M17-Ma29952	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
2.4.5-T	M17-Ma29952	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
2.4.5-TP	M17-Ma29952	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Actril (loxynil)	M17-Ma29952	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dicamba	M17-Ma29952	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dichlorprop	M17-Ma29952	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dinitro-o-cresol	M17-Ma29952	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dinoseb	M17-Ma29952	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
MCPA	M17-Ma29952	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
MCPB	M17-Ma29952	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Mecoprop	M17-Ma29952	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Phenols (Halogenated)				Result 1	Result 2	RPD		
2-Chlorophenol	S17-Ma29524	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
2.4.5-Trichlorophenol	S17-Ma29524	CP	mg/kg	< 1	< 1	<1	30%	Pass
2.4.6-Trichlorophenol	S17-Ma29524	CP	mg/kg	< 1	< 1	<1	30%	Pass
4-Chloro-3-methylphenol	S17-Ma29524	CP	mg/kg	< 1	< 1	<1	30%	Pass

Duplicate								
Phenols (non-Halogenated)				Result 1	Result 2	RPD		
Phenol	S17-Ma29524	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Phthalates				Result 1	Result 2	RPD		
Bis(2-ethylhexyl)phthalate	S17-Ma29524	CP	mg/kg	< 5	< 5	<1	30%	Pass
Butyl benzyl phthalate	S17-Ma29524	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Di-n-butyl phthalate	S17-Ma29524	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Di-n-octyl phthalate	S17-Ma29524	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Diethyl phthalate	S17-Ma29524	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dimethyl phthalate	S17-Ma29524	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Chromium (hexavalent)				Result 1	Result 2	RPD		
Chromium (hexavalent)	S17-Ma29524	CP	mg/kg	< 1	< 1	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Molybdenum	S17-Ma17665	NCP	mg/kg	6.8	7.6	10	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD		
TRH C10-C14	S17-Ma29530	CP	mg/kg	26	27	7.0	30%	Pass
TRH C15-C28	S17-Ma29530	CP	mg/kg	< 50	< 50	<1	30%	Pass
TRH C29-C36	S17-Ma29530	CP	mg/kg	< 50	< 50	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
TRH >C10-C16	S17-Ma29530	CP	mg/kg	< 50	< 50	<1	30%	Pass
TRH >C16-C34	S17-Ma29530	CP	mg/kg	< 100	< 100	<1	30%	Pass
TRH >C34-C40	S17-Ma29530	CP	mg/kg	< 100	< 100	<1	30%	Pass
Duplicate								
pH (1:5 Aqueous extract)				Result 1	Result 2	RPD		
pH (1:5 Aqueous extract)	S17-Ma29530	CP	pH Units	6.0	5.7	pass	30%	Pass
Duplicate								
% Moisture				Result 1	Result 2	RPD		
% Moisture	S17-Ma29534	CP	%	23	22	3.0	30%	Pass
Duplicate								
Cyanide (total)				Result 1	Result 2	RPD		
Cyanide (total)	M17-Ma29983	NCP	mg/kg	< 5	< 5	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD		
TRH C10-C14	S17-Ma29542	CP	mg/kg	< 20	< 20	<1	30%	Pass
TRH C15-C28	S17-Ma29542	CP	mg/kg	< 50	< 50	<1	30%	Pass
TRH C29-C36	S17-Ma29542	CP	mg/kg	< 50	< 50	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
TRH >C10-C16	S17-Ma29542	CP	mg/kg	< 50	< 50	<1	30%	Pass
TRH >C16-C34	S17-Ma29542	CP	mg/kg	< 100	< 100	<1	30%	Pass
TRH >C34-C40	S17-Ma29542	CP	mg/kg	< 100	< 100	<1	30%	Pass
Duplicate								
pH (1:5 Aqueous extract)				Result 1	Result 2	RPD		
pH (1:5 Aqueous extract)	S17-Ma29543	CP	pH Units	9.0	9.0	pass	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	S17-Ma29543	CP	mg/kg	< 2	< 2	<1	30%	Pass
Cadmium	S17-Ma29543	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	S17-Ma29543	CP	mg/kg	30	33	10	30%	Pass
Copper	S17-Ma29543	CP	mg/kg	38	33	12	30%	Pass
Lead	S17-Ma29543	CP	mg/kg	< 5	< 5	<1	30%	Pass

Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Mercury	S17-Ma29543	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Nickel	S17-Ma29543	CP	mg/kg	40	41	2.0	30%	Pass
Selenium	S17-Ma29543	CP	mg/kg	3.3	3.5	7.0	30%	Pass
Zinc	S17-Ma29543	CP	mg/kg	37	41	10	30%	Pass
Duplicate								
% Moisture				Result 1	Result 2	RPD		
% Moisture	S17-Ma29545	CP	%	18	17	5.0	30%	Pass
Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Acenaphthene	S17-Ma29547	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Acenaphthylene	S17-Ma29547	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Anthracene	S17-Ma29547	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(a)anthracene	S17-Ma29547	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(a)pyrene	S17-Ma29547	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(b&j)fluoranthene	S17-Ma29547	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(g,h,i)perylene	S17-Ma29547	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(k)fluoranthene	S17-Ma29547	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chrysene	S17-Ma29547	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dibenz(a,h)anthracene	S17-Ma29547	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluoranthene	S17-Ma29547	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluorene	S17-Ma29547	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	S17-Ma29547	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Naphthalene	S17-Ma29547	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Phenanthrene	S17-Ma29547	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Pyrene	S17-Ma29547	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
BTEX				Result 1	Result 2	RPD		
Benzene	S17-Ma29551	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Toluene	S17-Ma29551	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Ethylbenzene	S17-Ma29551	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
m&p-Xylenes	S17-Ma29551	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
o-Xylene	S17-Ma29551	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Xylenes - Total	S17-Ma29551	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass
Duplicate								
Volatile Organics				Result 1	Result 2	RPD		
1,1-Dichloroethane	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1,1-Dichloroethene	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1,1,1-Trichloroethane	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1,1,1,2-Tetrachloroethane	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1,1,2-Trichloroethane	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1,1,2,2-Tetrachloroethane	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1,2-Dibromoethane	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1,2-Dichlorobenzene	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1,2-Dichloroethane	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1,2-Dichloropropane	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1,2,3-Trichloropropane	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1,2,4-Trimethylbenzene	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1,3-Dichlorobenzene	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1,3-Dichloropropane	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1,3,5-Trimethylbenzene	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1,4-Dichlorobenzene	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
2-Butanone (MEK)	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
2-Propanone (Acetone)	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
4-Chlorotoluene	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass

Duplicate								
<b>Volatile Organics</b>				Result 1	Result 2	RPD		
4-Methyl-2-pentanone (MIBK)	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Allyl chloride	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Bromobenzene	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Bromochloromethane	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Bromodichloromethane	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Bromoform	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Bromomethane	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Carbon disulfide	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Carbon Tetrachloride	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chlorobenzene	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chloroethane	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chloroform	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chloromethane	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
cis-1,2-Dichloroethene	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
cis-1,3-Dichloropropene	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dibromochloromethane	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dibromomethane	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dichlorodifluoromethane	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Iodomethane	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Isopropyl benzene (Cumene)	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Methylene Chloride	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Styrene	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Tetrachloroethene	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
trans-1,2-Dichloroethene	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
trans-1,3-Dichloropropene	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Trichloroethene	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Trichlorofluoromethane	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Vinyl chloride	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>				Result 1	Result 2	RPD		
Naphthalene	S17-Ma29551	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
<b>Phenols (Halogenated)</b>				Result 1	Result 2	RPD		
2,4-Dichlorophenol	S17-Ma31744	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
2,6-Dichlorophenol	S17-Ma31744	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Pentachlorophenol	S17-Ma31744	NCP	mg/kg	< 1	< 1	<1	30%	Pass
Tetrachlorophenols - Total	S17-Ma31744	NCP	mg/kg	< 1	< 1	<1	30%	Pass
Duplicate								
<b>Phenols (non-Halogenated)</b>				Result 1	Result 2	RPD		
2-Cyclohexyl-4,6-dinitrophenol	S17-Ma31744	NCP	mg/kg	< 20	< 20	<1	30%	Pass
2-Methyl-4,6-dinitrophenol	S17-Ma31744	NCP	mg/kg	< 5	< 5	<1	30%	Pass
2-Methylphenol (o-Cresol)	S17-Ma31744	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
2-Nitrophenol	S17-Ma31744	NCP	mg/kg	< 1	< 1	<1	30%	Pass
2,4-Dimethylphenol	S17-Ma31744	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
2,4-Dinitrophenol	S17-Ma31744	NCP	mg/kg	< 5	< 5	<1	30%	Pass
3&4-Methylphenol (m&p-Cresol)	S17-Ma31744	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
4-Nitrophenol	S17-Ma31744	NCP	mg/kg	< 5	< 5	<1	30%	Pass
Dinoseb	S17-Ma31744	NCP	mg/kg	< 20	< 20	<1	30%	Pass
Duplicate								
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>				Result 1	Result 2	RPD		
TRH C10-C14	S17-Ma29555	CP	mg/kg	< 20	< 20	<1	30%	Pass
TRH C15-C28	S17-Ma29555	CP	mg/kg	73	64	14	30%	Pass
TRH C29-C36	S17-Ma29555	CP	mg/kg	61	< 50	23	30%	Pass

Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
TRH >C10-C16	S17-Ma29555	CP	mg/kg	< 50	< 50	<1	30%	Pass
TRH >C16-C34	S17-Ma29555	CP	mg/kg	< 100	< 100	<1	30%	Pass
TRH >C34-C40	S17-Ma29555	CP	mg/kg	< 100	< 100	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	S17-Ma29557	CP	mg/kg	4.0	4.1	3.0	30%	Pass
Cadmium	S17-Ma29557	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Copper	S17-Ma29557	CP	mg/kg	53	54	2.0	30%	Pass
Lead	S17-Ma29557	CP	mg/kg	12	12	1.0	30%	Pass
Mercury	S17-Ma29557	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Nickel	S17-Ma29557	CP	mg/kg	12	11	10	30%	Pass
Selenium	S17-Ma29557	CP	mg/kg	2.0	2.1	5.0	30%	Pass
Silver	S17-Ma29557	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Zinc	S17-Ma29557	CP	mg/kg	37	36	4.0	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
pH (1:5 Aqueous extract)	S17-Ma29558	CP	pH Units	6.9	6.6	pass	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	S17-Ma29562	CP	%	18	15	20	30%	Pass
Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Acenaphthene	S17-Ma29563	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Acenaphthylene	S17-Ma29563	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Anthracene	S17-Ma29563	CP	mg/kg	< 0.5	0.7	56	30%	Fail Q15
Benz(a)anthracene	S17-Ma29563	CP	mg/kg	1.3	1.2	3.0	30%	Pass
Benzo(a)pyrene	S17-Ma29563	CP	mg/kg	1.4	1.3	7.0	30%	Pass
Benzo(b&j)fluoranthene	S17-Ma29563	CP	mg/kg	1.7	1.6	10	30%	Pass
Benzo(g,h,i)perylene	S17-Ma29563	CP	mg/kg	1.2	1.0	10	30%	Pass
Benzo(k)fluoranthene	S17-Ma29563	CP	mg/kg	0.8	0.8	2.0	30%	Pass
Chrysene	S17-Ma29563	CP	mg/kg	1.1	1.1	1.0	30%	Pass
Dibenz(a,h)anthracene	S17-Ma29563	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluoranthene	S17-Ma29563	CP	mg/kg	2.3	2.8	21	30%	Pass
Fluorene	S17-Ma29563	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	S17-Ma29563	CP	mg/kg	1.0	0.9	9.0	30%	Pass
Naphthalene	S17-Ma29563	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Phenanthrene	S17-Ma29563	CP	mg/kg	0.6	1.4	78	30%	Fail Q15
Pyrene	S17-Ma29563	CP	mg/kg	2.3	2.6	14	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD		
TRH C6-C9	S17-Ma29566	CP	mg/kg	< 20	< 20	<1	30%	Pass
Duplicate								
BTEX				Result 1	Result 2	RPD		
Benzene	S17-Ma29566	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Toluene	S17-Ma29566	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Ethylbenzene	S17-Ma29566	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
m&p-Xylenes	S17-Ma29566	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
o-Xylene	S17-Ma29566	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Xylenes - Total	S17-Ma29566	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
Naphthalene	S17-Ma29566	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
TRH C6-C10	S17-Ma29566	CP	mg/kg	< 20	< 20	<1	30%	Pass

Duplicate								
				Result 1	Result 2	RPD		
pH (1:5 Aqueous extract)	S17-Ma29574	CP	pH Units	6.9	7.0	pass	30%	Pass
% Moisture	S17-Ma29574	CP	%	21	20	7.0	30%	Pass
Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Acenaphthene	S17-Ma29575	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Acenaphthylene	S17-Ma29575	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Anthracene	S17-Ma29575	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benz(a)anthracene	S17-Ma29575	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(a)pyrene	S17-Ma29575	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(b&j)fluoranthene	S17-Ma29575	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(g,h,i)perylene	S17-Ma29575	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(k)fluoranthene	S17-Ma29575	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chrysene	S17-Ma29575	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dibenz(a,h)anthracene	S17-Ma29575	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluoranthene	S17-Ma29575	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluorene	S17-Ma29575	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	S17-Ma29575	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Naphthalene	S17-Ma29575	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Phenanthrene	S17-Ma29575	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Pyrene	S17-Ma29575	CP	mg/kg	< 0.5	< 0.5	<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
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
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
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
Q15	The RPD reported passes Eurofins   mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

### Authorised By

Mary Makarios	Analytical Services Manager
Alex Petridis	Senior Analyst-Organic (VIC)
Huong Le	Senior Analyst-Inorganic (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)
Ryan Hamilton	Senior Analyst-Inorganic (NSW)
Ryan Hamilton	Senior Analyst-Metal (NSW)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (NSW)



### Glenn Jackson

#### National Operations 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](#).

Eurofins | mgt shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins | mgt be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

# Certificate of Analysis

DRC Environmental Pty Ltd  
 Suite G6/79-109 Manningham Rd  
 Bulleen  
 VIC 3105



NATA Accredited  
 Accreditation Number 1261  
 Site Number 18217

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: Patrick Baldwin

Report 539755-W  
 Project name DUNHEVED CIRCUIT  
 Project ID ST MARYS  
 Received Date Mar 27, 2017

Client Sample ID			TB01	TB03_250317	TB04_250317
Sample Matrix			Water	Water	Water
Eurofins   mgt Sample No.			S17-Ma29560	S17-Ma29577	S17-Ma29578
Date Sampled			Mar 24, 2017	Mar 25, 2017	Mar 25, 2017
Test/Reference	LOR	Unit			
TRH C6-C10 less BTEX (F1) <sup>N04</sup>	0.02	mg/L	< 0.02	< 0.02	< 0.02
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>					
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02
<b>BTEX</b>					
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	89	91	86
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>					
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02
<b>Volatile Organics</b>					
Naphthalene <sup>N02</sup>	0.01	mg/L	< 0.01	< 0.01	< 0.01

### 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 (regarding both quality and NATA accreditation).

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
TRH C6-C10 less BTEX (F1) - Method: LM-LTM-ORG-2010	Sydney	Mar 27, 2017	14 Day
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: TRH C6-C36 - LTM-ORG-2010	Sydney	Mar 27, 2017	7 Day
BTEX - Method: TRH C6-C40 - LTM-ORG-2010	Sydney	Mar 27, 2017	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Sydney	Mar 27, 2017	7 Day
Volatile Organics - Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices	Sydney	Mar 27, 2017	7 Days

**Company Name:** DRC Environmental Pty Ltd  
**Address:** Suite G6/79-109 Manningham Rd  
Bulleen  
VIC 3105  
**Project Name:** DUNHEVED CIRCUIT  
**Project ID:** ST MARYS

**Order No.:**  
**Report #:** 539755  
**Phone:** 0402 455 638  
**Fax:**

**Received:** Mar 27, 2017 11:20 AM  
**Due:** Apr 3, 2017  
**Priority:** 5 Day  
**Contact Name:** Patrick Baldwin

**Eurofins | mgt Analytical Services Manager : Mary Makarios**

Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	Moisture Set	ENM Exemption Suite -The excavated natural material order 2014 NSW	NSW DECC - Waste Classification Table 1	BTEX and Volatile TRH
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>													X	
<b>Sydney Laboratory - NATA Site # 18217</b>						X	X	X	X	X	X	X	X	X
<b>Brisbane Laboratory - NATA Site # 20794</b>														
<b>Perth Laboratory - NATA Site # 18217</b>														
<b>External Laboratory</b>														
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID									
1	TP01_0.1	Mar 24, 2017		Soil	S17-Ma29521		X				X	X		
2	TP01_0.7	Mar 24, 2017		Soil	S17-Ma29522						X	X		
3	TP01_1.6	Mar 24, 2017		Soil	S17-Ma29523					X				
4	TP02_0.05	Mar 24, 2017		Soil	S17-Ma29524	X					X		X	
5	TP02_1.2	Mar 24, 2017		Soil	S17-Ma29527						X	X		
6	TP03_0.1	Mar 24, 2017		Soil	S17-Ma29528		X				X	X		
7	TP03_1.0	Mar 24, 2017		Soil	S17-Ma29529					X				
8	TP03_1.2	Mar 24, 2017		Soil	S17-Ma29530						X	X		
9	TP04_0.6	Mar 24, 2017		Soil	S17-Ma29531						X	X		

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Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	Moisture Set	ENM Exemption Suite -The excavated natural material order 2014 NSW	NSW DECC - Waste Classification Table 1	BTEX and Volatile TRH	
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>													X		
<b>Sydney Laboratory - NATA Site # 18217</b>						X	X	X	X	X	X	X	X	X	X
<b>Brisbane Laboratory - NATA Site # 20794</b>															
<b>Perth Laboratory - NATA Site # 18217</b>															
10	TP05_0.1	Mar 24, 2017		Soil	S17-Ma29532	X					X	X			
11	TP05_0.2	Mar 24, 2017		Soil	S17-Ma29533					X					
12	TP05_0.6	Mar 24, 2017		Soil	S17-Ma29534						X	X			
13	TP06_0.1	Mar 24, 2017		Soil	S17-Ma29535	X					X		X		
14	TP06_0.6	Mar 24, 2017		Soil	S17-Ma29536						X	X			
15	TP07_0.1	Mar 24, 2017		Soil	S17-Ma29537	X					X	X			
16	TP07_0.6	Mar 24, 2017		Soil	S17-Ma29538						X	X			
17	TP08_0.1	Mar 24, 2017		Soil	S17-Ma29539		X				X	X			
18	TP08_0.5	Mar 24, 2017		Soil	S17-Ma29540					X					
19	TP08_1.5	Mar 24, 2017		Soil	S17-Ma29541						X	X			
20	TP08_3.9	Mar 24, 2017		Soil	S17-Ma29542						X	X			
21	TP09_0.1	Mar 24, 2017		Soil	S17-Ma29543	X					X	X			

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Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	Moisture Set	ENM Exemption Suite -The excavated natural material order 2014 NSW	NSW DECC - Waste Classification Table 1	BTEX and Volatile TRH
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>													X	
<b>Sydney Laboratory - NATA Site # 18217</b>						X	X	X	X	X	X	X	X	X
<b>Brisbane Laboratory - NATA Site # 20794</b>														
<b>Perth Laboratory - NATA Site # 18217</b>														
22	TP09_2.5	Mar 24, 2017		Soil	S17-Ma29544						X	X		
23	TP10_0.1	Mar 24, 2017		Soil	S17-Ma29545						X	X		
24	TP10_2.8	Mar 24, 2017		Soil	S17-Ma29546					X				
25	SS01	Mar 24, 2017		Soil	S17-Ma29547						X	X		
26	TP11_0.2	Mar 24, 2017		Soil	S17-Ma29548			X			X	X		
27	TP11_0.7	Mar 24, 2017		Soil	S17-Ma29549						X	X		
28	TP11_2.9	Mar 24, 2017		Soil	S17-Ma29550				X					
29	TP12_0.1	Mar 24, 2017		Soil	S17-Ma29551			X			X		X	
30	TP12_2.2	Mar 24, 2017		Soil	S17-Ma29552						X	X		
31	TP12_3.2	Mar 24, 2017		Soil	S17-Ma29553					X				
32	TP13_0.1	Mar 24, 2017		Soil	S17-Ma29554			X			X	X		
33	TP13_1.2	Mar 24, 2017		Soil	S17-Ma29555						X	X		

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**Eurofins | mgt Analytical Services Manager : Mary Makarios**

Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	Moisture Set	ENM Exemption Suite -The excavated natural material order 2014 NSW	NSW DECC - Waste Classification Table 1	BTEX and Volatile TRH
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>													X	
<b>Sydney Laboratory - NATA Site # 18217</b>						X	X	X	X	X	X	X	X	X
<b>Brisbane Laboratory - NATA Site # 20794</b>														
<b>Perth Laboratory - NATA Site # 18217</b>														
34	TP13_2.9	Mar 24, 2017		Soil	S17-Ma29556					X				
35	TP14_0.2	Mar 24, 2017		Soil	S17-Ma29557	X					X	X		
36	TP14_1.4	Mar 24, 2017		Soil	S17-Ma29558						X	X		
37	TP14_2.9	Mar 24, 2017		Soil	S17-Ma29559					X				
38	TB01	Mar 24, 2017		Water	S17-Ma29560									X
39	TP15_0.1	Mar 25, 2017		Soil	S17-Ma29562			X			X		X	
40	TP15_2.0	Mar 25, 2017		Soil	S17-Ma29563						X	X		
41	TP15_3.5	Mar 25, 2017		Soil	S17-Ma29564						X	X		
42	TP16_0.2	Mar 25, 2017		Soil	S17-Ma29565			X			X	X		
43	TP16_1.0	Mar 25, 2017		Soil	S17-Ma29566						X	X		
44	TP17_0.2	Mar 25, 2017		Soil	S17-Ma29567			X			X	X		
45	TP17_1.5	Mar 25, 2017		Soil	S17-Ma29568					X				

<b>Company Name:</b> DRC Environmental Pty Ltd	<b>Order No.:</b>	<b>Received:</b> Mar 27, 2017 11:20 AM
<b>Address:</b> Suite G6/79-109 Manningham Rd Bulleen VIC 3105	<b>Report #:</b> 539755	<b>Due:</b> Apr 3, 2017
<b>Project Name:</b> DUNHEVED CIRCUIT	<b>Phone:</b> 0402 455 638	<b>Priority:</b> 5 Day
<b>Project ID:</b> ST MARYS	<b>Fax:</b>	<b>Contact Name:</b> Patrick Baldwin

**Eurofins | mgt Analytical Services Manager : Mary Makarios**

Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	Moisture Set	ENM Exemption Suite -The excavated natural material order 2014 NSW	NSW DECC - Waste Classification Table 1	BTEX and Volatile TRH
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>													X	
<b>Sydney Laboratory - NATA Site # 18217</b>						X	X	X	X	X	X	X	X	X
<b>Brisbane Laboratory - NATA Site # 20794</b>														
<b>Perth Laboratory - NATA Site # 18217</b>														
46	TP17_3.5	Mar 25, 2017		Soil	S17-Ma29569						X	X		
47	TP16_3.0	Mar 25, 2017		Soil	S17-Ma29570					X				
48	TP18_0.2	Mar 25, 2017		Soil	S17-Ma29571			X			X	X		
49	TP18_2.5	Mar 25, 2017		Soil	S17-Ma29572						X	X		
50	QC01_250317	Mar 25, 2017		Soil	S17-Ma29573			X			X	X		
51	QC03_250317	Mar 25, 2017		Soil	S17-Ma29574						X	X		
52	TP19_0.2	Mar 25, 2017		Soil	S17-Ma29575						X	X		
53	TP19_3.5	Mar 25, 2017		Soil	S17-Ma29576						X	X		
54	TB03_250317	Mar 25, 2017		Water	S17-Ma29577									X
55	TB04_250317	Mar 25, 2017		Water	S17-Ma29578									X
56	TP19	Mar 25, 2017		Other	S17-Ma29579			X						
<b>Test Counts</b>						6	3	9	1	10	41	37	4	3

## Internal Quality Control Review and Glossary

### General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. 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 Sample Receipt Advice.

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.

**\*\*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

<b>Dry</b>	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
<b>LOR</b>	Limit of Reporting.
<b>SPIKE</b>	Addition of the analyte to the sample and reported as percentage recovery.
<b>RPD</b>	Relative Percent Difference between two Duplicate pieces of analysis.
<b>LCS</b>	Laboratory Control Sample - reported as percent recovery
<b>CRM</b>	Certified Reference Material - reported as percent recovery
<b>Method Blank</b>	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
<b>Surr - Surrogate</b>	The addition of a like compound to the analyte target and reported as percentage recovery.
<b>Duplicate</b>	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
<b>Batch Duplicate</b>	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
<b>Batch SPIKE</b>	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
<b>USEPA</b>	United States Environmental Protection Agency
<b>APHA</b>	American Public Health Association
<b>TCLP</b>	Toxicity Characteristic Leaching Procedure
<b>COC</b>	Chain of Custody
<b>SRA</b>	Sample Receipt Advice
<b>CP</b>	Client Parent - QC was performed on samples pertaining to this report
<b>NCP</b>	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
<b>TEQ</b>	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 50-150%-Phenols & PFASs 20-130%

### 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
<b>Method Blank</b>								
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>								
TRH C6-C9			mg/L	< 0.02		0.02	Pass	
<b>Method Blank</b>								
<b>BTEX</b>								
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	
<b>Method Blank</b>								
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>								
TRH C6-C10			mg/L	< 0.02		0.02	Pass	
<b>Method Blank</b>								
<b>Volatile Organics</b>								
Naphthalene			mg/L	< 0.01		0.01	Pass	
<b>LCS - % Recovery</b>								
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>								
TRH C6-C9			%	92		70-130	Pass	
<b>LCS - % Recovery</b>								
<b>BTEX</b>								
Benzene			%	87		70-130	Pass	
Toluene			%	94		70-130	Pass	
Ethylbenzene			%	93		70-130	Pass	
m&p-Xylenes			%	98		70-130	Pass	
o-Xylene			%	96		70-130	Pass	
Xylenes - Total			%	97		70-130	Pass	
<b>LCS - % Recovery</b>								
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>								
TRH C6-C10			%	81		70-130	Pass	
<b>LCS - % Recovery</b>								
<b>Volatile Organics</b>								
Naphthalene			%	101		70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
<b>Spike - % Recovery</b>								
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>								
TRH C6-C9			S17-Ma29595	NCP	%	122	70-130	Pass
<b>Spike - % Recovery</b>								
<b>BTEX</b>								
Benzene			S17-Ma29364	NCP	%	88	70-130	Pass
Toluene			S17-Ma29364	NCP	%	89	70-130	Pass
Ethylbenzene			S17-Ma29364	NCP	%	89	70-130	Pass
m&p-Xylenes			S17-Ma29364	NCP	%	94	70-130	Pass
o-Xylene			S17-Ma29364	NCP	%	95	70-130	Pass
Xylenes - Total			S17-Ma29364	NCP	%	95	70-130	Pass
<b>Spike - % Recovery</b>								
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>								
TRH C6-C10			S17-Ma32978	NCP	%	87	70-130	Pass
<b>Spike - % Recovery</b>								
<b>Volatile Organics</b>								
Naphthalene			S17-Ma29364	NCP	%	95	70-130	Pass

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
<b>Duplicate</b>									
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>				Result 1	Result 2	RPD			
TRH C6-C9	S17-Ma28877	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
<b>Duplicate</b>									
<b>BTEX</b>				Result 1	Result 2	RPD			
Benzene	S17-Ma28877	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S17-Ma28877	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S17-Ma28877	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S17-Ma28877	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S17-Ma28877	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	S17-Ma28877	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
<b>Duplicate</b>									
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>				Result 1	Result 2	RPD			
TRH C6-C10	S17-Ma28877	NCP	mg/L	0.06	0.06	5.0	30%	Pass	
<b>Duplicate</b>									
<b>Volatile Organics</b>				Result 1	Result 2	RPD			
Naphthalene	S17-Ma28877	NCP	mg/L	< 0.01	< 0.01	<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.
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.

### Authorised By

Mary Makarios                      Analytical Services Manager  
 Ryan Hamilton                      Senior Analyst-Volatile (NSW)



**Glenn Jackson**

**National Operations 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](#).

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Environmental

CERTIFICATE OF ANALYSIS

Work Order : ES1707373
ΧΛΕΝΤ : DRC ENVIRONMENTAL
Χονταχτ : ΜΡ ΠΑΤΡΙΚ ΒΑΛΔWIN
Αδδρσσ : Συιτε Γ 6 79-109 Μαννινγηαμ Ροαδ
BYMEEN 3105
Τελετηνονε : ----
Προφχτ : ----
Ορδερνυμπερ : ----
Χ-Ο-Χνυμπερ : ----
Σαμπερ : ----
Σιτε : ----
Θυοτε νυμπερ : Βλανκετ Θυοτε
No. οφσαμπερ σ ρεχειωδ : 2
No. οφσαμπερ σ αναμσδ : 2

Παγε : 1 οφδ
Λαβοραορψ : ΕνταρομνταλΔιαοιον Σψδνεψ
Χονταχτ : Βρωωμν Σηεεν
Αδδρσσ : 277-289 WooδπαρκΡοαδ Σμιτηφελδ NSW Αυστραλα 2164
Τελετηνονε : +61-3-849 9636
Date Σαμπερ σ Ρεχειωδ : 28-Μαρ-2017 12:50
Date Αναμσδ Χομμενχεδ : 29-Μαρ-2017
Ισσε Date : 03-Απρ-2017 17:53



Τηισ ρεπορτυπε ρσδε σ ανψ πρσσωσ ρεπορ(σ) ωτη τηισ ρεφ ρενηε . Ρε συιτσ αππλωτο τηε σαμπερ(σ) ασ συβμιπεδ . Τηισ δοχυμεντ σηαλλνοτ βε ρεπραδυχεδ , εχηε ππιν φλλ

Τηισ Χε ρηχατε οφ Αναμσδ χονται σ τηε φλλωινγ ιν φορματιον :

- Γενεραλ Χομμενιτσ
• Αναμτχαλ Ρε συιτσ
• Δε σ χριτωε Ρε συιτσ
• Συρρατε Χοντρολιμιτσ

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

Τηισ δοχυμεντ ηασ βεε ν ελεχτραιχαλλ σιγνεδ βψ τηε αυτηορζεδ σιγνατορε σ βε λω . Ελεχτραιχ σιγνινγ ισ χαρμδ ουτιν χομρλανχε ωτη προχεδ υρεσ σ τηε χιφεδ ιν 21 ΧΦΡ Παρτ11 .

Table with 3 columns: Signatories, Position, Accreditation Category. Lists names like Ανκιτ θοση, Εδωανδψ Φαδφρ, Πετερ Wu and their respective roles and accreditation categories.

Παγε : 2 οφθ  
WοrkOρδερ : ΕΣ1707373  
Χλεντ : DPX ENCI PONMENTAL  
Προφχτ : ----



## General Comments

Τη αναλυτικά προεδωρε υσεδ βψ τη Ενωρονμενταλ Διωσιον ησσε βεεν δεωλοπεδ φση εσταβλοηδ ιντερναποναλμ ρεχογνιζεδ προεδωρε συχη ασ ηροσε πυβλοηδ βψ τη ΥΣΕΠΑ, ΑΠΗΑ, ΑΣ ανδ ΝΕΠΜ. Ιν ηουσε δεωλοπεδ προεδωρε αρε εμρλοηδ ιν τη αβσενχε οφδοχουμενεδ στανδαρδ ορβψχλεντ ρευεστ

Wηερε μοισυρε δετε γμιναιον ησσε βεεν περφημεδ, ρεσυλσ αρε ρεπορεδ ον α δρμωειγητ βασσ.

Wηερε α ρεπορεδ λεσσηαν (<) ρεσυλσ ηιγηε ρηηαν τηε ΛΟΡ, ηισ μαψβε δυε το ηρηαρμσαμρλε εζτραχτδινεσταπε διλπον ανδ/ορινσ αφχηεντ σαμρλε φφαναλμσσ.

Wηερε τηε ΛΟΡ οφα ρεπορεδ ρεσυλτ διφφ ραφση στανδαρδ ΛΟΡ, ηισ μαψβε δυε το ηιγη μοισυρε χοντεντ, ινσ αφχηεντ σαμρλε (ρεδυχεδ ωειγητ εμρλοηδ) ορματρξ ιντε ρφφρενχε.

Wηεν νο σαμρλνγ τιπε ισ πρσδεδ, τηε σαμρλνγ τιπε ωλλδε φυλ 00:00 ον τηε δατε οφσαμρλνγ. Ιφνο σαμρλνγ δατε ισ πρσδεδ, τηε σαμρλνγ δατε ωλλβε ασσυηεδ βψ τηε λαβορατορμανδ διστυαηεδ ιν βρακκετσ ωιηροτ α τιπε χοηρονεντ.

Wηερε α ρεσυλσ ρεθυιρεδ το μεετ χοηρλανχε λμιτσ τηε ασσχατιαδ υνχε ραινημψιστβε χονσδερεδ. Ρε φερτο τηε ΑΛΣ Χονταχτ φρδεταιλο.

Κεψ: ΧΑΣ Nυμβερ= ΧΑΣ ρεγιστρμυμβε ρφση δαταβασε μαινταινεδ βψ Χηε μιχαλ Αβσραχισ Σε ραχεσ. Τηε Χηε μιχαλ Αβσραχισ Σε ραχε ισ α διωσιον οφηε Αμερχαν Χηε μιχαλ Σοχηε τιμ.  
ΛΟΡ = Λιμιτ οφ ρεπορτινγ  
^ = Τηισ ρεσυλσ ισ χοηρυτεδ φση ιν διωδυαλ αναλμτε δετε χπονατ οραβοσε τηε λεωλοφρεπορτινγ  
ø = ΑΛΣ ισ νοτ ΝΑΤΑ αχχεδιτεδ φρτηε σε τεσσ.  
~ = Ιν διχαπεσαν εστυατεδ δαυε.

- EA200N: Ασβεσσο ωειγητσ ανδ περχεναγεσ αρε νοτ χοσφρεδ υνδε ρηε Σχοπε οφ ΝΑΤΑ Αχχεδιταπον.  
Wειγητσ οφ Ασβεσσο αρε βασεδ ον εζτραχτεδ βυλκ ασβεσσο, φβρε βυνδλεσ, ανδ/ορ ΑΧΜ ανδ δο νοτ ιν χλυδε ρεσπρφλε φβρεσ (ιφπρεσεντ)  
Τηε Φραβλε Ασβεσσο ωειγητσ χαλχυλατεδ φση τηε εζτραχτεδ Φβρασ Ασβεσσο ανδ Ασβεσσο Φνεσ ασ αν εθυιαδεντ ωειγητσ οφ 100% Ασβεσσο  
Περχεναγεσ φρ Ασβεσσο χοντεντ ιν ΑΧΜ αρε βασεδ ον τηε 2013 ΝΕΠΜ δε φυλτ δαυεσ.  
Αλλχαλχυλαπονασ οφ περχεναγε Ασβεσσο υνδε ρηισ μεθοδ αρε αππρξίματα ανδ σηρυλδ βε υσεδ ασ α γυιδε ον λμ.
- EA200 'Am' Αμοσπε (βραυν ασβεσσο)
- EA200 'Xr' Χρσχιδολιτε (βλε ασβεσσο)
- EA200 'Τραξε' – Ασβεσσο φβρεσ ("Φρε Φιβρεσ") δετε χτεδ βψ τηε αναλμσσ πε ρΑΣ4964. Τηε ρεσυλτ χαν βε ιντε ρηρεδ τηα τηε σαμρλε χονταινσ δετε χταβλε 'ρεσπρφλε' ασβεσσο φβρεσ
- EA200: Ασβεσσο Ιδεντιφχαπον Σαμρλε σ ωερε αναλμσεδ βψ Πολαρσεδ Λγητ Μιχρσχαψμ ιν χλυδινγ διστε ρσων σταινινγ.
- EA200 Λεγε νδ
- EA200 'Χη' Χηρμσυλε (ωηιτε ασβεσσο)
- EA200: "ΥΜΦ Υνκνωων Μινε ραφβρεσ." – Ιν διχαπεσ φβρεσ δετε χτεδ μαψορμαψ νοτ βε ασβεσσο φβρεσ. Χονφμαποιν βψ αλε ρναπαιε τε χηνιθουε ισ ρεχομπεν δεδ.
- EA200: Νεγατιβε ρεσυλσ φρσων ψηιλε σ σηρυλδ βε χονφρμεδ βψ αν ιν δεπενδεντ αναλμτχατε χηνιθουε.
- EA200N: ΑΛΣ λαβορατορμ προεδωρε ανδ μεηροδσ υσεδ φρτηε ιδεντιφχαπον ανδ θυανπιταπον οφ ασβεσσο αρε χονσισεντ ωιηη ΑΣ4964–2004 ανδ τηε ρεθυιρμεντοσ οφηε 2013 ΝΕΠΜ φρ Ασσessment οφ Σηε Χονταμιναιον
- Βενζο(α)πμρνε Τοξιχηψ Εθυιαδεντ Θυοπεντ (ΤΕΘ) ισ τηε συμ τοταλοφηε χονχεντραπον οφηε ειγητ χαρχογε νιχ ΠΑΗσ μιληπλεδ βψ τηε ιρ Τοξιχηψ Εθυιαδεντ Φαχτορ (ΤΕΦ) ρελαπαιε το Βενζο(α)πμρνε. ΤΕΦ δαυεσ αρε πρσδεδ ιν βρακκετσ ασ φλωσ: Βενζ(α)νηηραχενε (0.1), Χηρμσυλε (0.01), Βενζο(β+φ) & Βενζο(κ)φιοραηενε (0.1), Βενζο(α)πμρνε (1.0), Ινδενο(1.2.3.χδ)πμρνε (0.1), Διβενζ(α.η)νηηραχενε (1.0), Βενζο(γ.η.ι)περμηνε (0.01). Λεσσηαν ΛΟΡ ρεσυλσ φρ ΤΕΘ Ζε ρδ αρε τρεατεδ ασ ζε ρα φρ ΤΕΘ 1/2 ΛΟΡ' αρε τρεατεδ ασ ηαληηε ρεπορεδ ΛΟΡ, ανδ φρ ΤΕΘ ΛΟΡ' αρε τρεατεδ ασ βεινγ εθυαλιτο τηε ρεπορεδ ΛΟΡ.  
Note: ΤΕΘ 1/2 ΛΟΡ ανδ ΤΕΘ ΛΟΡ ωλλχαλχυλατε ασ 0.6mg/Kγ ανδ 1.2mg/Kγ ρεσπεχτιωλ φρσ σαμρλε σ ωιηη νον–δετε χπο φρ αλλοφηε ειγητ ΤΕΘ ΠΑΗσ.
- EA200: Φορσαμρλεσ λαρε ρηηαν 30γ, τηε <2mm φφχποιν μαψβε σψβ–σαμρλεδ προρτο τραχε αναλμσσ ασ ουτνεδ ιν ΙΣΟ23909:2008(E) Σε χτ6.3.2–2
- EA200: 'Ψεσ' – Ασβεσσο δετε χτεδ βψ πολαρσεδ λγητ μιχρσχαψμ ιν χλυδινγ διστε ρσων σταινινγ.
- EA200: 'Νο\*' – Νο ασβεσσο φουνδ, α τηε ρεπορτινγ λμιτ οφ 0.1γ/κγ, βψ πολαρσεδ λγητ μιχρσχαψμ ιν χλυδινγ διστε ρσων σταινινγ. Ασβεσσο ματε ραλωασ δετε χτεδ ανδ ποσπωλμ ιδεντιφεδ ατ χονχεντραπονασ εστυατεδ το βε βελω 0.1γ/κγ.
- EA200: 'Νο' – Νο ασβεσσο φουνδ α τηε ρεπορτινγ λμιτ 0.1γ/κγ, βψ πολαρσεδ λγητ μιχρσχαψμ ιν χλυδινγ διστε ρσων σταινινγ.

Παγε : 3 οφ6  
 WorkOrder : ΕΣ1707373  
 Χλεντ : DPX ENCI PONMENTAA  
 Προφχτ : ----



## Analytical Results

Συβ-Μαρξ: SOIL (Μαρξ: SOIL)				Client sample ID	QC02_250317	QC04_250317	----	----	----
Client sampling date / time				25-Μαρ-2017 00:00	25-Μαρ-2017 00:00	----	----	----	
Compound	CAS Number	LOR	Unit	ES1707373-001	ES1707373-002	-----	-----	-----	
				Ρεσυτ	Ρεσυτ	----	----	----	
<b>EA002 : pH (Soils)</b>									
pH Value	----	0.1	πΗ Υνπ	8.7	7.5	----	----	----	
<b>EA010: Conductivity</b>									
Electrical Conductivity @ 25°C	----	1	μΣ/cm	118	116	----	----	----	
<b>EA055: Moisture Content</b>									
Moisture Content (dried @ 103°C)	----	1	%	8.2	17.0	----	----	----	
<b>EA200: AS 4964 - 2004 Identification of Asbestos in Soils</b>									
Asbestos Detected	1332-21-4	0.1	γ/κγ	No	----	----	----	----	
Asbestos Type	1332-21-4	-	--	-	----	----	----	----	
Sample weight (dry)	----	0.01	γ	202	----	----	----	----	
APPROVED IDENTIFIER:	----	-	--	S.SPOONER	----	----	----	----	
<b>EA200N: Asbestos Quantification (non-NATA)</b>									
∅ Free Fibres	----	5	Φβρεσ	No	----	----	----	----	
∅ Friable Asbestos	1332-21-4	0.0004	γ	<0.0004	----	----	----	----	
∅ Friable Asbestos (as Asbestos in Soil)	1332-21-4	0.001	% (ω/ω)	<0.001	----	----	----	----	
∅ Asbestos Containing Material	1332-21-4	0.1	γ	<0.1	----	----	----	----	
∅ Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	1332-21-4	0.01	% (ω/ω)	<0.01	----	----	----	----	
∅ Weight Used for % Calculation	----	0.0001	κγ	0.202	----	----	----	----	
<b>EG005T: Total Metals by ICP-AES</b>									
Arsenic	7440-38-2	5	mg/κγ	<5	6	----	----	----	
Cadmium	7440-43-9	0.4	mg/κγ	<0.4	<0.4	----	----	----	
Chromium	7440-47-3	2	mg/κγ	9	22	----	----	----	
Copper	7440-50-8	5	mg/κγ	10	14	----	----	----	
Lead	7439-92-1	5	mg/κγ	23	15	----	----	----	
Nickel	7440-02-0	2	mg/κγ	5	7	----	----	----	
Zinc	7440-66-6	5	mg/κγ	39	46	----	----	----	
<b>EG035T: Total Recoverable Mercury by FIMS</b>									
Mercury	7439-97-6	0.1	mg/κγ	<0.1	<0.1	----	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	0.5	mg/κγ	<0.5	<0.5	----	----	----	
Acenaphthylene	208-96-8	0.5	mg/κγ	<0.5	<0.5	----	----	----	
Acenaphthene	83-32-9	0.5	mg/κγ	<0.5	<0.5	----	----	----	
Fluorene	86-73-7	0.5	mg/κγ	<0.5	<0.5	----	----	----	

Παγε : 4 οφ6  
 WorkOrder : ΕΣ1707373  
 Χλεντ : DPX ENCI PONMENTAA  
 Πρωχτ : ----



## Analytical Results

Συβ-Ματξ: SOIL (Ματρξ: SOIL)				Client sample ID	QC02_250317	QC04_250317	----	----	----
Client sampling date / time				25-Μα-2017 00:00	25-Μα-2017 00:00	----	----	----	
Compound	CAS Number	LOR	Unit	ES1707373-001	ES1707373-002	-----	-----	-----	
				Ρεσυτ	Ρεσυτ	----	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>									
Phenanthrene	85-01-8	0.5	mg/ky	<0.5	<0.5	----	----	----	
Anthracene	120-12-7	0.5	mg/ky	<0.5	<0.5	----	----	----	
Fluoranthene	206-44-0	0.5	mg/ky	<0.5	<0.5	----	----	----	
Pyrene	129-00-0	0.5	mg/ky	<0.5	<0.5	----	----	----	
Benz(a)anthracene	56-55-3	0.5	mg/ky	<0.5	<0.5	----	----	----	
Chrysene	218-01-9	0.5	mg/ky	<0.5	<0.5	----	----	----	
Benzo(b+j)fluoranthene	205-99-2205-82-3	0.5	mg/ky	<0.5	<0.5	----	----	----	
Benzo(k)fluoranthene	207-08-9	0.5	mg/ky	<0.5	<0.5	----	----	----	
Benzo(a)pyrene	50-32-8	0.5	mg/ky	<0.5	<0.5	----	----	----	
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/ky	<0.5	<0.5	----	----	----	
Dibenz(a.h)anthracene	53-70-3	0.5	mg/ky	<0.5	<0.5	----	----	----	
Benzo(g.h.i)perylene	191-24-2	0.5	mg/ky	<0.5	<0.5	----	----	----	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/ky	<0.5	<0.5	----	----	----	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/ky	<0.5	<0.5	----	----	----	
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/ky	<b>0.6</b>	<b>0.6</b>	----	----	----	
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/ky	<b>1.2</b>	<b>1.2</b>	----	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C10 - C14 Fraction	----	50	mg/ky	<50	<50	----	----	----	
C15 - C28 Fraction	----	100	mg/ky	<100	<100	----	----	----	
C29 - C36 Fraction	----	100	mg/ky	<100	<100	----	----	----	
^ C10 - C36 Fraction (sum)	----	50	mg/ky	<50	<50	----	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
>C10 - C16 Fraction	----	50	mg/ky	<50	<50	----	----	----	
>C16 - C34 Fraction	----	100	mg/ky	<100	<100	----	----	----	
>C34 - C40 Fraction	----	100	mg/ky	<100	<100	----	----	----	
^ >C10 - C40 Fraction (sum)	----	50	mg/ky	<50	<50	----	----	----	
<b>EP080: BTEXN</b>									
Benzene	71-43-2	0.2	mg/ky	<0.2	<0.2	----	----	----	
Toluene	108-88-3	0.5	mg/ky	<0.5	<0.5	----	----	----	
Ethylbenzene	100-41-4	0.5	mg/ky	<0.5	<0.5	----	----	----	
meta- & para-Xylene	108-38-3106-42-3	0.5	mg/ky	<0.5	<0.5	----	----	----	
ortho-Xylene	95-47-6	0.5	mg/ky	<0.5	<0.5	----	----	----	
^ Total Xylenes	1330-20-7	0.5	mg/ky	<0.5	<0.5	----	----	----	
^ Sum of BTEX	----	0.2	mg/ky	<0.2	<0.2	----	----	----	

Παγε : 5 οφ6  
 WorkOrder : ΕΣ1707373  
 Χλεντ : DPX ENGI PONMENTAA  
 Προφχτ : ----



## Analytical Results

Συβ-Μαρξ: SOIL (Ματρξ: SOIL)				Client sample ID	QC02_250317	QC04_250317	----	----	----
Client sampling date / time				25-Μαρ-2017 00:00	25-Μαρ-2017 00:00	----	----	----	
Compound	CAS Number	LOR	Unit	ES1707373-001	ES1707373-002	-----	-----	-----	
				Ρεσυτ	Ρεσυτ	----	----	----	
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	0.5	%	82.0	82.7	----	----	----	
2-Chlorophenol-D4	93951-73-6	0.5	%	84.2	84.5	----	----	----	
2.4.6-Tribromophenol	118-79-6	0.5	%	69.2	72.1	----	----	----	
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	0.5	%	87.5	86.3	----	----	----	
Anthracene-d10	1719-06-8	0.5	%	86.9	86.5	----	----	----	
4-Terphenyl-d14	1718-51-0	0.5	%	86.2	85.4	----	----	----	
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1.2-Dichloroethane-D4	17060-07-0	0.2	%	110	106	----	----	----	
Toluene-D8	2037-26-5	0.2	%	106	99.4	----	----	----	
4-Bromofluorobenzene	460-00-4	0.2	%	107	100	----	----	----	

## Analytical Results

### Descriptive Results

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
<b>EA200: AS 4964 - 2004 Identification of Asbestos in Soils</b>		
EA200: Δεσχημμον	ΘΧ02_250317 -25-Μαρ-2017 00:00	Μιδ βραυν σανδψσαλ

Παγε : 6 οφ6  
WopκOpæp : EΣ1707373  
Χλεντ : DPX ENçI PONMENTAA  
Πpæχτ : ----



## Surrogate Control Limits

Συβ-Μαρξ: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130



QUALITY CONTROL REPORT

Work Order : ES1707373

Παγε : 1 οφθ

Χλεντ : DRC ENVIRONMENTAL
Χονταχτ : MR ΠΑΤΡΙΚ ΒΑΛΔWIN
Αδδρεσσ : Συιτε Γ 6 79-109 Μαννινγηαμ Ροαδ
BYMEEN 3105

Λαβοραορψ : Ενωρο/μενταλΔιασων Σψδνεψ
Χονταχτ : Βρωωψν Σηεεν
Αδδρεσσ : 277-289 WooδπαρκΡοαδ Σμιηφελδ NSW Αυστραα 2164

Τελεπηονε : ----
Προφχτ : ----
Ορδερνυμβερ : ----
Χ-Ο-Χνυμβερ : ----
Σαμπλερ : ----
Σιτε : ----
Θυοτε νυμβερ : Βλανετ Θυοτε
No. οφσαμπλεσ ρεχειωδ : 2
No. οφσαμπλεσ αναλυσδ : 2

Τελεπηονε : +61-3-849 9636
Date Σαμπλεσ Ρεχειωδ : 28-Μαρ-2017
Date Αναλυσω Χομμενχεδ : 29-Μαρ-2017
Ισσυε Date : 03-Απρ-2017



Τηισ ρεπορτσυε ρσδεσ ανψπρεωουσ ρεπορ(σ)ωιη τηισ ρεφ ρενηε. Ρεσυλσ απιλω το τηε σαμπλε(σ)ασ σψβμιπεδ. Τηισ δοχυμεντ σηαλλνοτ βε ρεπρωδυχεδ, εχηεπιν φιλλ
Τηισ Θυαλιψ Χοντρολ Ρεπορτχονταινσ τηε φιλωινγ ινφωρματιον:

- Λαβοραορψ Δυπληατε (DYΠ) Ρεπορτ Ρελαπωε Περχεναγε Διφφ ρενηε (PPD) ανδ Αχηεπιανηε Λμιτισ
• Με τηοδ Βλανε (MB) ανδ Λαβοραορψ Χοντρολ Στικε (ΛΧΣ) Ρεπορτ Ρεχοσφμανδ Αχηεπιανηε Λμιτισ
• Ματρξ Στικε (ΜΣ) Ρεπορτ Ρεχοσφμανδ Αχηεπιανηε Λμιτισ

Signatories

Τηισ δοχυμεντ ηασ βεεεν ελεχτροιχαλμ σιγνεδ βψ τηε αυτηορζεδ σιγνατορεσ βελω. Ελεχτροιχαλμ σιγνινη σιχαρριδ ουτιν χομρλανχε ωιη προχεδυρεσ στεχηεδ ιν 21 ΧΦΡ Παρτ11.

Table with 3 columns: Signatories, Position, Accreditation Category. Rows include Ανκιτ θοση, Εδωανδψ Φαδφωρ, Πετερ Wu, Ραγηονδ Χομμοδορε, Σανφ σιγηι θψαι, Σηαυν Σποονερ, and Βισαη Μαρασσα.

Παγε : 2 οφ6  
 WorkOrder : ΕΣ1707373  
 Χλεντ : DPX ENCI PONMENTAL  
 Προφχτ : ----



## General Comments

Τη αναλυτικά προεδωρα υσεδ βψ τη ενωρονενταλ Δισιον ηαβε βεεν δεωθεπεδ φση εσταβλοηεδ ιντερναποναλμ ρεχοννιζεδ προεδωρα συχη ασ ηηοσε πυβλοηεδ βψ τη ΥΣΕΠΑ, ΑΠΗΑ, ΑΣ ανδ ΝΕΠΜ. Ιν ηουσε δεωθεπεδ προεδωρα αρε εηρλοηεδ ιν τη αβσενχε οφοδουμεντεδ στανδαρδ ορβψχλεντ ρεβυσετ

Wηερε μοισυρε δετεμιναν ηασ βεεν περφημεδ, ρεωλοσ αρε ρεπορεδ ον α δρμειγιη βασισ.

Wηερε α ρεπορεδ λεσσηαν (<) ρεωλοσ ισηγιηε ρηαν τηε ΛΟΡ, ηηοσ μαψβε δυε το ηρμαρψαηηε εζτραηιδιγε σπαε διλυον ανδ/ορινσυφχηντ σαηηε φραναλμσ. Wηερε τηε ΛΟΡ οφα ρεπορεδ ρεωλοσ διφφ ροφση στανδαρδ ΛΟΡ, ηηοσ μαψβε δυε το ηηγτ

Κεψ: Ανωνυμοσ = Ρεφ ροσ σαηηε σ ωηιχη αρε νοτ σπεχιαλμ ηαρτοφηηοσ ωορκορδερβυτ φημεδ ηαρτοφηηε ΘΧ προεσσολτ  
 ΧΑΣ Nυμβε ρ= ΧΑΣ ρεηοσ ημυηε ροφση δαταβασε μαινηαινεδ βψ Χηε μιχαλαβσ ροχτο Σε ραχεσ. Τηε Χηε μιχαλαβσ ροχτο Σε ραχεσ ισ α δισιον οφηε Αμερχαν Χηε μιχαλασ οχηηψ.  
 ΛΟΡ = Λιμιτ οφ ρεπορηνγ  
 ΡΡΔ = Ρελεηωε Περχανταγε Διφφ ρενηε  
 # = Ινδιχατε σ φηλεδ ΘΧ

## Laboratory Duplicate (DUP) Report

Τηε θαυληψ χονηρδ ηεηη Λαβοραηοψ Δυηιλαχε ρεφ ροσ το α ρανδοηηψ σελεχηεδ ιν ηραλαβοραηοψ σηητ. Λαβοραηοψ δυηιλαχεσ ηραδδε ιν φηηαηον ρεγαρδνγ μεηηοδ ηεχηοιον ανδ σαηηε ηεηεραγενηεψ. Τηε ηεηηηεδ ρανγεσ φρ τηε Ρελεηωε Περχαντ Δεωαηον (ΡΡΔ) οφ Λαβοραηοψ Δυηιλαχεσ αρε σπεχηεδ ιν ΑΛΣ Μεηηοδ ΘWΙ-ΕΝ38 ανδ αρε δεηενδεντ ον τηε μαγινηυδε οφ ρεωλοσ ιν χοηηραρσον το τηε λεωλ οφ ρεπορηνγ: Ρεωλοσ < 10 ηηεσ ΛΟΡ: Νο Λιμιτ; Ρεωλοσ βεηωε εν 10 ανδ 20 ηηεσ ΛΟΡ: 0% -50%; Ρεωλοσ > 20 ηηεσ ΛΟΡ: 0% -20%.

Συβ-Μαρξ: SOIL

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EA002 : pH (Soils) (QC Lot: 815803)</b>									
ΕΣ1707373-001	ΘΧ02_250317	EA002: ηΗ ζα λυε	----	0.1	ηΗ Υνιη	8.7	8.8	0.00	0% -20%
ΕΣ1707464-004	Ανωνυμοσ	EA002: ηΗ ζα λυε	----	0.1	ηΗ Υνιη	7.0	7.0	0.00	0% -20%
<b>EA010: Conductivity (QC Lot: 815804)</b>									
ΕΣ1707373-001	ΘΧ02_250317	EA010: ΕλεχηηαλΧονδυηηοψ @ 25°Χ	----	1	μΣ/cm	118	127	7.24	0% -20%
ΕΣ1707464-004	Ανωνυμοσ	EA010: ΕλεχηηαλΧονδυηηοψ @ 25°Χ	----	1	μΣ/cm	43	41	3.83	0% -20%
<b>EA055: Moisture Content (QC Lot: 816134)</b>									
ΕΣ1707373-001	ΘΧ02_250317	EA055-103: Μοισυρε Χονηεντ (δρεδ @ 103°Χ)	----	1	%	8.2	8.4	2.04	No Limit
ΕΣ1707377-011	Ανωνυμοσ	EA055-103: Μοισυρε Χονηεντ (δρεδ @ 103°Χ)	----	1	%	18.8	17.2	8.57	0% -50%
<b>EG005T: Total Metals by ICP-AES (QC Lot: 815899)</b>									
ΕΣ1707373-001	ΘΧ02_250317	ΕΓ 005T-MW: Χαδμιομ	7440-48-9	0.4	mg/kg	<0.4	<0.4	0.00	No Limit
		ΕΓ 005T-MW: Χηρσαιομ	7440-47-3	2	mg/kg	9	8	13.4	No Limit
		ΕΓ 005T-MW: Νιχηελ	7440-02-0	2	mg/kg	5	5	0.00	No Limit
		ΕΓ 005T-MW: Αρσβιη	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		ΕΓ 005T-MW: Χοηηε ρ	7440-50-8	5	mg/kg	10	8	16.5	No Limit
		ΕΓ 005T-MW: Λεαδ	7439-92-1	5	mg/kg	23	22	7.47	No Limit
		ΕΓ 005T-MW: Ζινη	7440-66-6	5	mg/kg	39	34	13.0	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 815900)</b>									
ΕΣ1707373-001	ΘΧ02_250317	ΕΓ 035T-MW: Με ρηηψ	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 814604)</b>									
ΕΣ1707373-001	ΘΧ02_250317	ΕΠ075(ΣΙΜ): Ναηηηαλενε	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		ΕΠ075(ΣΙΜ): Αχηεναηηηψλενε	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		ΕΠ075(ΣΙΜ): Αχηεναηηηενε	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		ΕΠ075(ΣΙΜ): Φλορενε	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		ΕΠ075(ΣΙΜ): Πηεναηηρενε	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Παγε : 3 οφ6  
 WorkOrder : ΕΣ1707373  
 Χλεντ : DPX ENCI PONMENTAL  
 Πρωχτ : ----



Συβ-Μαρξ: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM): Polynuclear Aromatic Hydrocarbons (QC Lot: 814604) - continued</b>									
ΕΣ1707373-001	ΘΧ02_250317	ΕΠ075(SIM): Ανθρακένε	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		ΕΠ075(SIM): Φλουραντηνε	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		ΕΠ075(SIM): Πυρωε	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		ΕΠ075(SIM): Βενζ(α)ανθρακένε	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		ΕΠ075(SIM): Χηρωσσε	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		ΕΠ075(SIM): Βενζο(β+δ)φλουραντηνε	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		ΕΠ075(SIM): Βενζο(κ)φλουραντηνε	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		ΕΠ075(SIM): Βενζο(α)πυρωε	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		ΕΠ075(SIM): Ινδενο(1.2.3.χδ)πυρωε	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		ΕΠ075(SIM): Διβενζ(α.η)ανθρακένε	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		ΕΠ075(SIM): Βενζο(γ.η.ι)περωε	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		ΕΠ075(SIM): Συστ οφτολυχψχχ αρσαπιχ ηψφραρβνσ	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ΕΠ075(SIM): Βενζο(α)πυρωε ΤΕΘ (ζε ρθ)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 814605)</b>									
ΕΣ1707373-001	ΘΧ02_250317	ΕΠ071: Χ15 -Χ28 Φραπιον	----	100	mg/kg	<100	<100	0.00	No Limit
		ΕΠ071: Χ29 -Χ36 Φραπιον	----	100	mg/kg	<100	<100	0.00	No Limit
		ΕΠ071: Χ10 -Χ14 Φραπιον	----	50	mg/kg	<50	<50	0.00	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 814605)</b>									
ΕΣ1707373-001	ΘΧ02_250317	ΕΠ071: >Χ16 -Χ34 Φραπιον	----	100	mg/kg	<100	<100	0.00	No Limit
		ΕΠ071: >Χ34 -Χ40 Φραπιον	----	100	mg/kg	<100	<100	0.00	No Limit
		ΕΠ071: >Χ10 -Χ16 Φραπιον	----	50	mg/kg	<50	<50	0.00	No Limit
<b>EP080: BTEXN (QC Lot: 815773)</b>									
ΕΣ1707373-001	ΘΧ02_250317	ΕΠ080: Βενζενε	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		ΕΠ080: Τολενε	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		ΕΠ080: Ετηψβεζενε	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		ΕΠ080: μετα-& παρα-Ξψνε	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		ΕΠ080: ορηο-Ξψνε	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ΕΣ1707377-010	Ανονυμουσ	ΕΠ080: Βενζενε	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		ΕΠ080: Τολενε	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		ΕΠ080: Ετηψβεζενε	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		ΕΠ080: μετα-& παρα-Ξψνε	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		ΕΠ080: ορηο-Ξψνε	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Παγε : 4 οφ6  
 WorkOrder : ΕΣ1707373  
 Χλεντ : DPX ENCI PONMENTAL  
 Προφχτ : ----



## Method Blank (MB) and Laboratory Control Spike (LCS) Report

Τη θυαλιπ χοντρολ τετμ Μετθοδ / Λαβορατορμ Βλανκ ρεφροστο αν αναλυε φρε ματρξ το ωηιχη αλλ ρεαγεντοσ αρε αδοεδ ιν τη σατε ωαυμεσ ορ προπορτονοσ ασ υσεδ ιν στανδαρδ σαμπλε προεπαρτοιν. Τη πυρποσε οφ ηιτοσ ΘΧ παραπετεροσ το μοντορο ποτεντοαλ λαβορατορμ χονταμινατοιν. Τη θυαλιπ χοντρολ τετμ Λαβορατορμ Χοντρολ Σπικε (ΛΧΣ) ρεφροστο α χεριπεδ ρεφρενχε ματεριαλ ορ α κνοων ιντερεφρενχε φρε ματρξ σπικεδ ωιτη παρετ αναλυεσ. Τη πυρποσε οφ ηιτοσ ΘΧ παραπετεροσ το μοντοροτετηθο προχισον ανδ αχχυρασψινδε πενδε ντ οφ σαμπλε ματρξ. Διψνατιχ Ρεχοσφρψ/ημιτοσ αρε βασειδ ον σπιστοχαλε ωαυατοιν οφ προχεσσεδ ΛΧΣ.

Συβ-Μαρξ: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%)	
							Low	High
<b>EA010: Conductivity (QCLOT: 815804)</b>								
EA010: ΕλεχτροαλΧονδυλιωπιφ@ 25°X	----	1	μΣ/cm	<1	1412 μΣ/cm	98.2	92	108
<b>EG005T: Total Metals by ICP-AES (QCLOT: 815899)</b>								
EG 005T-MW: Αρσενιχ	7440-38-2	5	mg/kg	<5	21.7 mg/kg	87.1	77	121
EG 005T-MW: Χαδμιοιυμ	7440-43-9	0.4	mg/kg	<0.4	4.64 mg/kg	93.3	81	125
EG 005T-MW: Χηροσιοιυμ	7440-47-3	2	mg/kg	<2	----	----	----	----
EG 005T-MW: Χοππερ	7440-50-8	5	mg/kg	<5	32 mg/kg	95.9	85	133
EG 005T-MW: Λεαδ	7439-92-1	5	mg/kg	<5	40 mg/kg	102	76	126
EG 005T-MW: Νιχηελ	7440-02-0	2	mg/kg	<2	55 mg/kg	102	81	125
EG 005T-MW: Ζινχ	7440-66-6	5	mg/kg	<5	60.8 mg/kg	106	75	133
<b>EG035T: Total Recoverable Mercury by FIMS (QCLOT: 815900)</b>								
EG 035T-MW: Μερχυρψ	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	77.2	76	112
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLOT: 814604)</b>								
EP075(SIM): Ναπηηαλενε	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	107	77	125
EP075(SIM): Αχεναπηηηψαλενε	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	107	72	124
EP075(SIM): Αχεναπηηηνε	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	114	73	127
EP075(SIM): Φλυορενε	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	109	72	126
EP075(SIM): Πηενανηρενε	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	109	75	127
EP075(SIM): Ανηηραχενε	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	110	77	127
EP075(SIM): Φλυοραηηνε	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	109	73	127
EP075(SIM): Πψρρε	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	110	74	128
EP075(SIM): Βενζι(α)ανηηραχενε	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	104	69	123
EP075(SIM): Χηρψσρε	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	106	75	127
EP075(SIM): Βενζο(β+δ)φλυοραηηνε	205-99-2	0.5	mg/kg	<0.5	6 mg/kg	103	68	116
	205-82-3							
EP075(SIM): Βενζο(κ)φλυοραηηνε	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	103	74	126
EP075(SIM): Βενζο(α)πψρρε	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	104	70	126
EP075(SIM): Ινδενο(1.2.3.χδ)πψρρε	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	84.3	61	121
EP075(SIM): Διβενζι(α.η)ανηηραχενε	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	86.5	62	118
EP075(SIM): Βενζο(γ.η.)περψαλενε	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	83.1	63	121
<b>EP080/071: Total Petroleum Hydrocarbons (QCLOT: 814605)</b>								
EP071: X10 -X14 Φραχποιν	----	50	mg/kg	<50	200 mg/kg	99.2	75	129
EP071: X15 -X28 Φραχποιν	----	100	mg/kg	<100	300 mg/kg	103	77	131
EP071: X29 -X36 Φραχποιν	----	100	mg/kg	<100	200 mg/kg	106	71	129
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLOT: 814605)</b>								

Παγε : 5 οφ6  
 WorkOrder : ΕΣ1707373  
 Χλεντ : DPX ENCI PONMENTAL  
 Προφχτ : ----



Συβ-Μαρξ: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 814605) - continued</b>									
EP071: >X10 -X16 Φρακτιον	----	50	mg/kg	<50	250 mg/kg	97.9	77	125	
EP071: >X16 -X34 Φρακτιον	----	100	mg/kg	<100	350 mg/kg	90.4	74	138	
EP071: >X34 -X40 Φρακτιον	----	100	mg/kg	<100	150 mg/kg	107	63	131	
<b>EP080: BTEXN (QCLot: 815773)</b>									
EP080: Βενζενε	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	89.1	62	116	
EP080: Τολυενε	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	85.3	67	121	
EP080: Ετηψβεζενε	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	84.2	65	117	
EP080: μετα- & παρα-Ξυβνε	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	90.3	66	118	
EP080: ορηο-Ξυβνε	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	87.2	68	120	

### Matrix Spike (MS) Report

Τηε θυαλιη χοντρολ τεγι Ματριε Σπικε (ΜΣ) ρεφροσ το αν ιντραβοροσφρ σπλι σαμπλε στικεδ ωπη α ρεπρεσεντατιε σετ οφ παρτετ αναλυεσ. Τηε πυρτωσε οφ πηισ ΘΧ παρμετερ ισ το μονιτορ ποτεντιαλ ματριε εφφχισ ον αναλυε ρεχοσφρεσ. Σταπη Ρεχοσφρ/ημιτοσ ασ περλαβοροσφρ Data Θυαλιη Οβφ χηιωσ (DGOσ). Ιδε αλρεχοσφρ/ραγεσ στικεδ μαυβε ωιωσδ ιν τηε εσντ οφοσφρλε ματριε ιντε ρφφρενε.

Συβ-Μαρξ: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%)	
<b>EG005T: Total Metals by ICP-AES (QCLot: 815899)</b>							
ΕΣ1707373-001	ΘΧ02_250317	ΕΓ 005T-MW: Αρσενιχ	7440-38-2	50 mg/kg	98.3	70	130
		ΕΓ 005T-MW: Χαδμιομ	7440-43-9	50 mg/kg	101	70	130
		ΕΓ 005T-MW: Χηρσμιμ	7440-47-3	50 mg/kg	99.7	70	130
		ΕΓ 005T-MW: Χοππερ	7440-50-8	250 mg/kg	102	70	130
		ΕΓ 005T-MW: Λεσδ	7439-92-1	250 mg/kg	99.8	70	130
		ΕΓ 005T-MW: Νιχκελ	7440-02-0	50 mg/kg	96.1	70	130
		ΕΓ 005T-MW: Ζινχ	7440-66-6	250 mg/kg	106	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 815900)</b>							
ΕΣ1707373-001	ΘΧ02_250317	ΕΓ 035T-MW: Μερχιρψ	7439-97-6	5 mg/kg	93.8	70	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 814604)</b>							
ΕΣ1707373-001	ΘΧ02_250317	ΕΠ075(SIM): Αχεναπηηενε	83-32-9	10 mg/kg	92.2	70	130
		ΕΠ075(SIM): Πυρρε	129-00-0	10 mg/kg	95.3	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 814605)</b>							
ΕΣ1707373-001	ΘΧ02_250317	ΕΠ071: X10 -X14 Φρακτιον	----	523 mg/kg	87.6	73	137
		ΕΠ071: X15 -X28 Φρακτιον	----	2319 mg/kg	99.1	53	131
		ΕΠ071: X29 -X36 Φρακτιον	----	1714 mg/kg	106	52	132
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 814605)</b>							
ΕΣ1707373-001	ΘΧ02_250317	ΕΠ071: >X10 -X16 Φρακτιον	----	860 mg/kg	90.8	73	137

Παγε : 6 οφ6  
 WorkOrder : ΕΣ1707373  
 Χλεντ : DPX ENCI PONMENTAΛ  
 Πρωχτ : ----



Συβ-Μαρξ: SOIL

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 814605) - continued</b>							
ΕΣ1707373-01	ΘΧ02_250317	ΕΠ071: >X16 -X34 Φραχτιον	----	3223 mg/kg	105	53	131
		ΕΠ071: >X34 -X40 Φραχτιον	----	1058 mg/kg	93.7	52	132
<b>EP080: BTEXN (QCLot: 815773)</b>							
ΕΣ1707373-01	ΘΧ02_250317	ΕΠ080: Βενζε νε	71-48-2	2.5 mg/kg	84.2	70	130
		ΕΠ080: Τολε νε	108-88-3	2.5 mg/kg	83.1	70	130
		ΕΠ080: Ετηψβε νε	100-41-4	2.5 mg/kg	88.5	70	130
		ΕΠ080: μετα- & παρα-Ξυθνε	108-38-3	2.5 mg/kg	90.3	70	130
			106-42-3				
	ΕΠ080: ορηο-Ξυθνε	95-47-6	2.5 mg/kg	88.5	70	130	



## QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES1707373	Παγε	: 1 οφθ
Χλε ντ	: DRC ENVIRONMENTAL	Λαβορασιω	: ΕνωπαρμενωταλΔιωσιω Σψδνεψ
Χονταχτ	: MP ΠΑΤΡΙΧΚ ΒΑΔWIN	Τελεπιηνε	: +61-3-8549 9636
Προφχτ	: ----	Δατε Σαμπλεσ Ρεχειιωδ	: 28-Μφ-217
Σιπε	: ----	Ισσιε Δατε	: 03-Ατρ-217
Σαμπλερ	: ----	No. οφσαμπλεσ ρεχειιωδ	: 2
Ορδερνυμερ	: ----	No. οφσαμπλεσ αναλυσδ	: 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.

Βρε φωτεπηδδ συμμαρεσ ανδ ρεφ ρεχνεσ αρε αλο πρσδεδ το ασσστιν τρχεαβιλιψ.

### Summary of Outliers

#### Outliers : Quality Control Samples

Τηισ ρεπορτηγιληηισ ουτε ρεφ αγγεδ ιν τηε Θυαλιψ Χοντρολ(ΟΧ) Ρεπορτ

- **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.

#### Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

#### Outliers : Frequency of Quality Control Samples

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

Παγε : 2 οφθ  
 WorkOrder : ΕΣ1707373  
 Χλέντ : DPX ENCI PONMENTAΛ  
 Πρωχτ : ----



## Analysis Holding Time Compliance

Ισαστηρλεσ αρε ιδενιφεδ βελω ασ ηαωνγ βεν εν αναλυσδ ορεξτραχεδ ουσιδε οφροχομμενδεδ ηοδινγ πιμεσ, ηισ σηνυδ βε τακεν εντο χονσιδεραπον ωην εντερπρινγ ρεσυλσ.

Τηισ ρεπορτ συμμαρξεσ εξτραχπον / πρεπαραιον ανδ αναλυσσ πιμεσ ανδ χομπαρσεσ εαχη ωηη ΑΛΣ ρεχομμενδεδ ηοδινγ πιμεσ (ρεφραχνινγ ΥΣΕΠΑ SW 846, ΑΠΗΑ, ΑΣ ανδ ΝΕΠΜ) βασειδ ον τηε σασπλε χονταινερ πρσδεδ. Δατεσ ρεπορτεδ ρεπρσεντ φρσδατε οφεξτραχπον οραναλυσσ ανδ πρεχλυδε σφβεθευεντ διλιπονσ ανδ ρεφωσ. Α λστυν οφβραχηρεσ (ιφανψ)ισ πρσδεδ ηεραν.

Ηοδινγ πιμε φρ λεαχητε μεηοδσ (ε.γ. ΤΧΛΠ) αφψ αχχορνγ το τηε αναλυσσ ρεπορτεδ. Ασσεσμεντ χομπαρσε τηε λεαχη δατε ωηη τηε σπρρεστ αναλυσσ ηοδινγ πιμε φρ τηε εθουωδεντ σαλ μεηοδ. Τηεσε αρε οργανιχο 14 δαψσ, μερχυψδ8 δαψσ& σπηρεμεταλ 180 δαψσ. Α ρεχορδεδ βραχη δοεσ νοτ γυαρατεε α βραχη φραλλον-ωαπλε παρσπετερο.

Ηοδινγ πιμεσ φρ VOC in soils αφψ αχχορνγ το αναλυσσ οφ εντερρεστ ζινψλ Χηλορδε ανδ Σπυρνε ηοδινγ πιμε ισ 7 δαψσ; σπηρεσ 14 δαψσ Α ρεχορδεδ βραχη δοεσ νοτ γυαρατεε α βραχη φρ αλλ ζΟΧ αναλυσσ ανδ σηνυδ βε αφρεδ εν χασε τηε ρεπορτεδ βραχη ισ α φιλσε ποσπασε ορζινψλ Χηλορδε ανδ Σπυρνε αρε νοτ κεψ αναλυσσ οφ εντερρεστ χονχερν.

Ματρξ: SOIL

Εωδωσπον: \* = Ηοδινγ πιμε βραχη; ✓ = Ωητην ηοδινγ πιμε.

Method	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EA002 : pH (Soils)</b>							
Soil Glass Jar - Unpreserved (EA002) OX02_250317, OX04_250317	25-Mar-2017	30-Mar-2017	01-Ατρ-2017	✓	30-Mar-2017	30-Μαρ-2017	✓
<b>EA010: Conductivity</b>							
Soil Glass Jar - Unpreserved (EA010) OX02_250317, OX04_250317	25-Mar-2017	30-Mar-2017	01-Ατρ-2017	✓	30-Mar-2017	27-Ατρ-2017	✓
<b>EA055: Moisture Content</b>							
Soil Glass Jar - Unpreserved (EA055-103) OX02_250317, OX04_250317	25-Mar-2017	----	----	----	30-Mar-2017	08-Ατρ-2017	✓
<b>EA200: AS 4964 - 2004 Identification of Asbestos in Soils</b>							
Snap Lock Bag: Separate bag received (EA200) OX02_250317	25-Mar-2017	----	----	----	30-Mar-2017	21-Σεπ-2017	✓
<b>EA200N: Asbestos Quantification (non-NATA)</b>							
Snap Lock Bag: Separate bag received (EA200N) OX02_250317	25-Mar-2017	----	----	----	30-Mar-2017	21-Σεπ-2017	✓
<b>EG005T: Total Metals by ICP-AES</b>							
Soil Glass Jar - Unpreserved (EG005T-MW) OX02_250317, OX04_250317	25-Mar-2017	30-Mar-2017	21-Σεπ-2017	✓	30-Mar-2017	21-Σεπ-2017	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>							
Soil Glass Jar - Unpreserved (EG035T-MW) OX02_250317, OX04_250317	25-Mar-2017	30-Mar-2017	21-Σεπ-2017	✓	30-Mar-2017	21-Σεπ-2017	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>							
Soil Glass Jar - Unpreserved (EP075(SIM)) OX02_250317, OX04_250317	25-Mar-2017	29-Mar-2017	08-Ατρ-2017	✓	29-Mar-2017	08-Μαρ-2017	✓
<b>EP080/071: Total Petroleum Hydrocarbons</b>							
Soil Glass Jar - Unpreserved (EP071) OX02_250317, OX04_250317	25-Mar-2017	29-Mar-2017	08-Ατρ-2017	✓	30-Mar-2017	08-Μαρ-2017	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>							
Soil Glass Jar - Unpreserved (EP071) OX02_250317, OX04_250317	25-Mar-2017	29-Mar-2017	08-Ατρ-2017	✓	30-Mar-2017	08-Μαρ-2017	✓

Παγε : 3 οφ6  
 WorkOrder : ΕΣ1707373  
 Χλέντ : DPX ΕΝΣΙ ΠΟΝΜΕΝΤΑΛ  
 Πρωχτ : ----



Ματρξ: **SOIL**

Εωδυστον: \* = Ηοδινγ τιοε βρεαχη ; ✓ = Witην ηοδινγ τιοε.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP080: BTEXN</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b> ΘΧ02_250317,	ΘΧ04_250317	25-Mar-2017	30-Mar-2017	08-Ατρ-017	✓	30-Mar-2017	08-Ατρ-017	✓

Παγε : 4 οφθ  
 WorkOrder : ΕΣ1707373  
 Χλε ντ : DPX ENCI PONMENTAL  
 Πρωτ χτ : ----



## Quality Control Parameter Frequency Compliance

Τη φιλωινγ ρεπορτοσημαρσεσ τηε φεθευε νχψοφαβοραορμθΧ σαμπελεσ αναλμσεδ ωπητην τηε αναλυηαλλοι(σ)ιν ωηηχη τηε συβηηηπεδ σαμπελε(σ)ωασ(ωερε) προχεσσεδ. Αηηυαλαρε σρηυδ βε γρεαπερηαν ορεθυαλιτο τηε εεπηχεδε ραε. Α λσηγη οφβραχηεσισ προαδεδιν τηε ΣυμημαρμφοΟυηερο.

Ματρξ: **SOIL**

Εωαδιασπον: \* = Θυαλημ Χοντρολφεθευε νχψνοτ ωπητην στεχηφχαπον ; ✓ = Θυαλημ Χοντρολφεθευε νχψωπητην στεχηφχαπον.

Analytical Methods	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>ΛαβοραορμΔυηλαγεσ (DYΠ)</b>							
ΕλεχηραλΧονδυηωπημ (1:5)	EA010	2	13	15.38	10.00	✓	ΝΕΠΜ 2013 Β3 & ΑΛΣ ΘΧ Στανδαρδ
Μοισυρε Χοννε ντ	EA055-103	2	20	10.00	10.00	✓	ΝΕΠΜ 2013 Β3 & ΑΛΣ ΘΧ Στανδαρδ
ΠΑΗ/Πηε νολσ (ΣΙΜ)	ΕΠ075(ΣΙΜ)	1	2	50.00	10.00	✓	ΝΕΠΜ 2013 Β3 & ΑΛΣ ΘΧ Στανδαρδ
πηΗ (1:5)	EA002	2	15	13.33	10.00	✓	ΝΕΠΜ 2013 Β3 & ΑΛΣ ΘΧ Στανδαρδ
ΤοταλΜε ρχηρμβψΦΜΣ (Μιχρωααε Δηγε σπον)	ΕΓ 035T-MW	1	2	50.00	10.00	✓	ΝΕΠΜ 2013 Β3 & ΑΛΣ ΘΧ Στανδαρδ
ΤοταλΜε ταλσ βψΙΧΠΑΕΣ (Μιχρωααε Δηγε σπον)	ΕΓ 005T-MW	1	2	50.00	5.00	✓	ΝΕΠΜ 2013 Β3 & ΑΛΣ ΘΧ Στανδαρδ
ΤΡΗ -Σε μισαδπηλε Φραηπον	ΕΠ071	1	6	16.67	10.00	✓	ΝΕΠΜ 2013 Β3 & ΑΛΣ ΘΧ Στανδαρδ
ΤΡΗ ζο λπηλε σ/ΒΤΕΞ	ΕΠ080	2	20	10.00	10.00	✓	ΝΕΠΜ 2013 Β3 & ΑΛΣ ΘΧ Στανδαρδ
<b>ΛαβοραορμΧοντρολΣαμπελεσ (ΛΧΣ)</b>							
ΕλεχηραλΧονδυηωπημ (1:5)	EA010	1	13	7.69	5.00	✓	ΝΕΠΜ 2013 Β3 & ΑΛΣ ΘΧ Στανδαρδ
ΠΑΗ/Πηε νολσ (ΣΙΜ)	ΕΠ075(ΣΙΜ)	1	2	50.00	5.00	✓	ΝΕΠΜ 2013 Β3 & ΑΛΣ ΘΧ Στανδαρδ
ΤοταλΜε ρχηρμβψΦΜΣ (Μιχρωααε Δηγε σπον)	ΕΓ 035T-MW	1	2	50.00	5.00	✓	ΝΕΠΜ 2013 Β3 & ΑΛΣ ΘΧ Στανδαρδ
ΤοταλΜε ταλσ βψΙΧΠΑΕΣ (Μιχρωααε Δηγε σπον)	ΕΓ 005T-MW	1	2	50.00	5.00	✓	ΝΕΠΜ 2013 Β3 & ΑΛΣ ΘΧ Στανδαρδ
ΤΡΗ -Σε μισαδπηλε Φραηπον	ΕΠ071	1	6	16.67	5.00	✓	ΝΕΠΜ 2013 Β3 & ΑΛΣ ΘΧ Στανδαρδ
ΤΡΗ ζο λπηλε σ/ΒΤΕΞ	ΕΠ080	1	20	5.00	5.00	✓	ΝΕΠΜ 2013 Β3 & ΑΛΣ ΘΧ Στανδαρδ
<b>Με τηοδ Βλανκσ (ΜΒ)</b>							
ΕλεχηραλΧονδυηωπημ (1:5)	EA010	1	13	7.69	5.00	✓	ΝΕΠΜ 2013 Β3 & ΑΛΣ ΘΧ Στανδαρδ
ΠΑΗ/Πηε νολσ (ΣΙΜ)	ΕΠ075(ΣΙΜ)	1	2	50.00	5.00	✓	ΝΕΠΜ 2013 Β3 & ΑΛΣ ΘΧ Στανδαρδ
ΤοταλΜε ρχηρμβψΦΜΣ (Μιχρωααε Δηγε σπον)	ΕΓ 035T-MW	1	2	50.00	5.00	✓	ΝΕΠΜ 2013 Β3 & ΑΛΣ ΘΧ Στανδαρδ
ΤοταλΜε ταλσ βψΙΧΠΑΕΣ (Μιχρωααε Δηγε σπον)	ΕΓ 005T-MW	1	2	50.00	5.00	✓	ΝΕΠΜ 2013 Β3 & ΑΛΣ ΘΧ Στανδαρδ
ΤΡΗ -Σε μισαδπηλε Φραηπον	ΕΠ071	1	6	16.67	5.00	✓	ΝΕΠΜ 2013 Β3 & ΑΛΣ ΘΧ Στανδαρδ
ΤΡΗ ζο λπηλε σ/ΒΤΕΞ	ΕΠ080	1	20	5.00	5.00	✓	ΝΕΠΜ 2013 Β3 & ΑΛΣ ΘΧ Στανδαρδ
<b>Ματρξ Σηικεσ (ΜΣ)</b>							
ΠΑΗ/Πηε νολσ (ΣΙΜ)	ΕΠ075(ΣΙΜ)	1	2	50.00	5.00	✓	ΝΕΠΜ 2013 Β3 & ΑΛΣ ΘΧ Στανδαρδ
ΤοταλΜε ρχηρμβψΦΜΣ (Μιχρωααε Δηγε σπον)	ΕΓ 035T-MW	1	2	50.00	5.00	✓	ΝΕΠΜ 2013 Β3 & ΑΛΣ ΘΧ Στανδαρδ
ΤοταλΜε ταλσ βψΙΧΠΑΕΣ (Μιχρωααε Δηγε σπον)	ΕΓ 005T-MW	1	2	50.00	5.00	✓	ΝΕΠΜ 2013 Β3 & ΑΛΣ ΘΧ Στανδαρδ
ΤΡΗ -Σε μισαδπηλε Φραηπον	ΕΠ071	1	6	16.67	5.00	✓	ΝΕΠΜ 2013 Β3 & ΑΛΣ ΘΧ Στανδαρδ
ΤΡΗ ζο λπηλε σ/ΒΤΕΞ	ΕΠ080	1	20	5.00	5.00	✓	ΝΕΠΜ 2013 Β3 & ΑΛΣ ΘΧ Στανδαρδ



## Brief Method Summaries

Τη αναλυtical προχεδυρεσσεδ βψη Ενωρα/μενταλ Διωσιον ησσε βε εν δεσθεπεδ φση εσταβλσηδ εντε ρναποαλλη ρεχογιζεδ προχεδυρεσ συχη ασ ησσε πυβλσηδ βψη ΥΣ ΕΠΑ, ΑΠΗΑ, ΑΣ ανδ ΝΕΠΜ. Ιν ηουσε δεσθεπεδ προχεδυρεσ αρε ετρησπεδ ιν τη αβσενχε οφδοχυμενετεδ στανδαρδ ορβηχλιε ντ ρεθυσ Τη φλωινγ ρεπορτηρσδεσ βρε φδε σχρηπιοσ οψη αναλυtical προχεδυρεσ ετρησπεδ φρρστυλο ρεπορεδ ιν τη Χε ρηχατε οφΑναλυσ. Σουρχεσ φση ωηχη ΑΛΣ μετηοδσ ησσε βε εν δεσθεπεδ αρε τρσδεδ ωηχη τη Με τηοδ Δεσχηπιοσ.

Analytical Methods	Method	Matrix	Method Descriptions
πΗ (1:5)	EA002	ΣΟΙΛ	Ιν ηουσε: Ρεφρενχεδ το ΑΠΗΑ 4500Η+. πΗ ισ δετερμινεδ ον σαλσαμπεσ αφερα 1:5 σαλσατε ρεαχη. Τησ μετηοδ ισ χομρλαντ ωηη ΝΕΠΜ (2013) Σχηδυλε Β(3) (Με τηοδ 103)
Ελεχτηραλ Χονδυχιωπιω (1:5)	EA010	ΣΟΙΛ	Ιν ηουσε: Ρεφρενχεδ το ΑΠΗΑ 2510. Χονδυχιωπιω δετερμινεδ ον σαλσαμπεσ υσινγ α 1:5 σαλσατε ρεαχη. Τησ μετηοδ ισ χομρλαντ ωηη ΝΕΠΜ (2013) Σχηδυλε Β(3) (Με τηοδ 104)
Μοιστυρε Χοντε ντ	EA055-103	ΣΟΙΛ	Ιν ηουσε: Α γραμμετρη προχεδυρε βασεδ ον ωειγητ λσσσωφα 12 ηουρδρμω περοδ ατ 103-105 δεγρεσ Χ. Τησ μετηοδ ισ χομρλαντ ωηη ΝΕΠΜ (2013) Σχηδυλε Β(3) Σε χηιον 7.1 ανδ Ταβλε 1 (14 δαψηροδιγ τιμε).
Ασβεσσο Ιδενιφχαπον ιν Σοιλσ	EA200	ΣΟΙΛ	ΑΣ 4964 -2004 Με τηοδ φρηηε θυαλατρωε ιδενιφχαπον οφασβεσσο ιν βυλκ σαμπεσ Αναλυσ βψη Πολαρσεδ Λιγητ Μιχρωσχοπη νηχλδιγ διστε ρσον σταινιγ
Ασβεσσο Χλσσφχαπον ανδ Θυανπιαπον περ ΝΕΠΜ 2013	* EA200N	ΣΟΙΛ	Ασβεσσο Χλσσφχαπον ανδ Θυανπιαπον περ ΝΕΠΜ 2013 ωηη Χονφμαπον οφιδενιφχαπον βψη ΑΣ 4964 -2004 Γ ραμμετρη δετερμιναπον οφασβεσσο Χονταινιγ Ματε ραλ Φραβλε Ασβεσσο ανδ σαμπε ωειγητ ανδ χαχλυαπον οψη ρχενταγε χονχεντρωιοσ περ ΝΕΠΜ πρσχολοσ. Φραβλε Ασβεσσο ισ ρεπορεδ ασ τηε εθυιωα ντ ωειγητ ιν τη σαμπε ρεχειωδ αφε ραχχουνπιγ φρσυβ-σσηρλιγ (ωηε ρε απηλαβλε φρηηε <7mm ανδ/ορ <2mm φρηηιοσ).
Τοταλ Μεταλσ βψη ΙΧΠΑΕΣ (Μιχρωαωε Διγεστων)	ΕΓ 005Τ-ΜW	ΣΟΙΛ	Ιν ηουσε: Ρεφρενχεδ το ΥΣΕΠΑ SW846 -3051 (Μιχρωαωε Διγεστων); ΑΠΗΑ 3120; ΥΣΕΠΑ SW846 -6010. Μεταλσ ιν σολδσ αρε δετερμινεδ φλωινγ α μιχρωαωε διγεστων. Τη ΙΧΠΑΕΣ τεχηνιθιε ιονιζεσ σελεχτεδ ελεμεντοσ. Ιονσ αρε πασσεδ ιν το ηιγητ ωαχυμ μασσσπε χηρατε ρ, ωηχη σεπαρεσ τηε αναλυσε βασεδ ον τηε ιρ διστυχητ μασσ/χηραγε ραιοσ πρρροτ μεασυρμεντ βψη δισχηρε δψωδε ιον δετεχτορ. Τησ μετηοδ ισ χομρλαντ ωηη ΝΕΠΜ (2013) Σχηδυλε Β(3)
Τοταλ Με ρηρυβψη ΦΙΜΣ (Μιχρωαωε Διγεστων)	ΕΓ 035Τ-ΜW	ΣΟΙΛ	Ιν ηουσε: Ρεφρενχεδ το ΥΣΕΠΑ SW846 -3051 (Μιχρωαωε Διγεστων); ΑΣ 3550, ΑΠΗΑ 3112 Ηγ -Β (Φλω-νφχηπον (ΣνΧΛ)(Χοδ ζα πουργε νε ραπον) ΑΑΣ) ΦΙΜ-ΑΑΣ ισ αν αυτοματεδ φαμελεσ σατομιχη αβσορπιον τεχηνιθιε. Με ρηρυβμ σολδσ αρε δετερμινεδ φλωινγ α μιχρωαωε διγεστων. Ιονιχ με ρηρυβμσ ρεδυχεδ ον λνε το ατομιχη με ρηρυβμσ του ρβψη ΣνΧΛ ωηχη ισ τη εν πυρεδ ιν το ηεατεδ θυαρζ χελλ Θυανιφχαπον ισ βψη χομραριγ αβσορβανχε αγαινιστα χαλβραπον χυρωε Τησ μετηοδ ισ χομρλαντ ωηη ΝΕΠΜ (2013) Σχηδυλε Β(3)
ΤΡΗ -Σε μιωδαπλε Φραχηον	ΕΠ071	ΣΟΙΛ	Ιν ηουσε: Ρεφρενχεδ το ΥΣΕΠΑ SW 846 -8015Α Σαμπε εζηρατσ αρε αναλυσδ βψη Χαπιλλαρμφ Χ/ΦΙΔ ανδ θυανιφχεδ αγαινιστα κανε στανδαρδσ οσφρηε ραγε Χ10 -Χ40.
ΠΑΗ/Πηε νολοσ (ΣΙΜ)	ΕΠ075(ΣΙΜ)	ΣΟΙΛ	Ιν ηουσε: Ρεφρενχεδ το ΥΣΕΠΑ SW 846 -8270D Εζηρατσ αρε αναλυσδ βψη Χαπιλλαρμφ Χ/ΜΣ ιν Σελεχηπε Ιον Μοδε (ΣΙΜ) ανδ θυανιφχαπον ισ βψη χομραρσον αγαινισταν εσταβλσηδ 5 ποιντ χαλβραπον χυρωε Τησ μετηοδ ισ χομρλαντ ωηη ΝΕΠΜ (2013) Σχηδυλε Β(3) (Με τηοδ 502 ανδ 507)
ΤΡΗ ζο λπλε σ/ΒΤΕΞ	ΕΠ080	ΣΟΙΛ	Ιν ηουσε: Ρεφρενχεδ το ΥΣΕΠΑ SW 846 -8260B Εζηρατσ αρε αναλυσδ βψη Πυρε ανδ Τρατ, Χαπιλλαρμφ Χ/ΜΣ. Θυανιφχαπον ισ βψη χομραρσον αγαινισταν εσταβλσηδ 5 ποιντ χαλβραπον χυρωε

Preparation Methods	Method	Matrix	Method Descriptions
Μιχρωαωε Διγεστωφ Μεταλσ ιν Σοιλσ, Σε διμεντο ανδ Σλυδγεσ	EN31	ΣΟΙΛ	Ιν ηουσε: Ρεφρενχεδ το ΥΣΕΠΑ SW 846 -3051. Μιχρωαωε Ασσσεδ Νηρη Αχιδ Διγεστων 1.0γ οφσαμπε ισ μιξεδ ωηη 10 mL χονχ. Νηρη αχιδ ιν α χλοσεδ, ηιγητ πρσσπε ωσσελ ανδ ηεατεδ υσινγ α στε χηφχ πρσραπ. Διγεστωσ αππρσρατε φρσσελε χτεδ μεταλσ αναλυσ ιν σλυδγε, σεδιμεντο, σαλσ ανδ οιλσ. Τησ μετηοδ ισ χομρλαντ ωηη ΝΕΠΜ (2013) Σχηδυλε Β(3) (Με τηοδ 203)
1:5 σολδ / ωατε ρεαχη φρσολυβλε αναλυσ	EN34	ΣΟΙΛ	10 γ οφσαλισ μιξεδ ωηη 50 mL οφδιστυλεδ ωατε ρανδ τυμבלεδ ενδ οσφρε νδ φρ1 ηουρ. Ψατε ρσλυβλε σαλσ αρε λεαχηδ φση τηε σαλβψη χονπνυουσ συστε νσιον. Σαμπεσ αρε σεπλεδ ανδ τηε ωατε ρφηε ρεδ οφφρραναλυσ.

Παγε : 6 οφ6  
WorkOrder : ΕΣ1707373  
Χλέντ : DPX ΕΝΣΙ PΟΝΜΕΝΤΑΛ  
Προφχτ : ----



Preparation Methods	Method	Matrix	Method Descriptions
Μετηανολχ Εξτραχτιον οφσολδσ φρΠυργε ανδ Τρατ	* ΟΡΓ 16	ΣΟΙΛ	Ιν ηουσε: Ρεφρενχεδ το ΥΣΕΠΑ SW 846 –5030Α. 5γ οφσολδσ σθακεν ωπη συρρατε ανδ 10mL μετηανολτπρρ το αναλυσσ βψΠυργε ανδ Τρατ – Γ Χ/ΜΣ.
ΤυτβλερΕξτραχτιον οφσολδσ	ΟΡΓ 17	ΣΟΙΛ	Ιν ηουσε: Μεχηνιχαλαγιταπιον (τυτβλερ). 10γ οφσαπρλε, Na2ΣΟ4 ανδ συρρατε αρεεξτραχτεδ ωπη 30mL 1:1 DΧΜ/Αχετονε βψενδ σφερενδ τυτβλε. Τηε σολωντ ισ δεχαντεδ, δεηψφρατεδ ανδ χονχεντρατεδ (βψΚD) το τηε δεσρεδ ωλυτε φραναλυσσ.

## APPENDIX E – CHAIN OF CUSTODY DOCUMENTATION



# CHAIN OF CUSTODY DOCUMENTATION



**DRC ENVIRONMENTAL**  
Division of Resource Conservation  
**DRC Environmental Pty Ltd**

CLIENT: DRC Environmental Pty Ltd

SAMPLER:

ADDRESS / OFFICE: G6 / 79-109 Manningham Road, Bulleah VIC 3105

MOBILE:

PROJECT MANAGER (PM): Patrick Baldwin

PHONE:

PROJECT ID:

EMAIL REPORT TO: [patrick@drcenviro.com.au](mailto:patrick@drcenviro.com.au) [poppy@drcenviro.com.au](mailto:poppy@drcenviro.com.au)

SITE: P.O. NO:

EMAIL INVOICE TO: (if different to report)

RESULTS REQUIRED (Date): QUOTE NO.:

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

**FOR LABORATORY USE ONLY**  
 COOLER SEAL (circle appropriate)  
 Intact: Yes No N/A  
 SAMPLE TEMPERATURE  
 CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL

ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	R-12	R-16	R-17	ASSAYS N/A	Notes
	TP06-0.1	S	24/3		J, Asb, Bag		-			-	Notes: e.g. Highly contaminated samples e.g. "High PAHs expected". Extra volume for QC or trace LORs etc.  HOLD
	TP06-0.6				J						
	TP07-0.1				J, Asb, Bag			1		1	
	TP07-0.6				J						
	TP08-0.1				J, Asb, Bag					1	
	TP08-0.5				J						
	TP08-1.5				J						
	TP08-3.9				J						
	TP09-0.1				J, Asb, Bag			1		1	
	TP09-2.5				J						
	TP10-0.1				J, Asb, Bag					1	
	TP10-2.8	V	V		J						

RELINQUISHED BY:

RECEIVED BY: *SB*

METHOD OF SHIPMENT

Name:

Date:

Name: *SB*

Date: *27/3*

Con' Note No:

Of:

Time:

Of: *EURGINS*

Time: *11:20AM*

Transport Co:

Name:

Date:

Name:

Date:

Transport Co:

Of:

Time:

Of:

Time:

Transport Co:

**Water Container Codes:** P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved, V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulphuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulphuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.



# CHAIN OF CUSTODY DOCUMENTATION



**DRC ENVIRONMENTAL**  
Environmental & Process Services Pty Ltd  
**DRC Environmental Pty Ltd**

CLIENT: DRC Environmental Pty Ltd

SAMPLER: *P. Prochaska*

ADDRESS / OFFICE: G6 / 79-109 Manningham Road, Bulleen VIC 3105

MOBILE: *04-90659492*

PROJECT MANAGER (PM): Patrick Baldwin

PHONE:

PROJECT ID: *St Marys*

EMAIL REPORT TO: *patrick@drcenviro.com.au*

SITE: P.O. NO.:

EMAIL INVOICE TO: (if different to report): *rease@drcenviro.com.au*

RESULTS REQUIRED (Date): *Standard TR* QUOTE NO.:

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

**FOR LABORATORY USE ONLY**

COOLER SEAL (circle appropriate)  
 Intact: Yes No N/A

SAMPLE TEMPERATURE  
 CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	R12	R16	R17	Asbestos NORM	TPH Co-Ca	HO-D
	TP14-2a	S	24/3		J							X
	TB01	N	24/3		2x vials							
	TB02	N	24/3		2x vials							
	TP15-01	S	25/3		J + Asb.	1						
	TP15-20				J							
	TP15-3.5				J							
	TP16-0.2				J + Asb							
	TP16-1.0				J							
	TP16-3.0				J							X
	TP17-0.2				J + Asb							
	TP17-1.5				J							X
	TP17-3.5				J							

Notes: e.g. Highly contaminated samples  
 e.g. "High PAHs expected".  
 Extra volume for QC or trace LORs etc.

SAMPLE INFORMATION (note: S = Soil, W = Water)

ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles
	TP14-2a	S	24/3		J	
	TB01	N	24/3		2x vials	
	TB02	N	24/3		2x vials	
	TP15-01	S	25/3		J + Asb.	1
	TP15-20				J	
	TP15-3.5				J	
	TP16-0.2				J + Asb	
	TP16-1.0				J	
	TP16-3.0				J	
	TP17-0.2				J + Asb	
	TP17-1.5				J	
	TP17-3.5				J	

RELINQUISHED BY:

Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Of: \_\_\_\_\_ Time: \_\_\_\_\_

RECEIVED BY:

Name: *AD* Date: *27/3*  
 Of: *Geoffrey* Time: *11:20am*

METHOD OF SHIPMENT

Con' Note No: \_\_\_\_\_  
 Transport Co: \_\_\_\_\_

**Water Container Codes:** P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Co Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved;  
 V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass.  
 Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.



**Rupan Virk**

*Rupan 28/3*

**From:** Renee Prochazka <renee@drcenviro.com.au> 14:48.  
**Sent:** Tuesday, 28 March 2017 2:48 PM  
**To:** Rupan Virk  
**Subject:** RE: Eurofins | mgt Sample Receipt Advice - Report 539755 : Site DUNHEVED CIRCUIT (ST MARYS)

Ah,  
I see. Please do the asbestos absence/presence analysis if not enough sample was provided. As for Foreign Materials – please change the analysis to no-FM where sample volume is not enough.

Regards  
Renee

---

**From:** [RupanVirk@eurofins.com](mailto:RupanVirk@eurofins.com) [mailto:[RupanVirk@eurofins.com](mailto:RupanVirk@eurofins.com)]  
**Sent:** Tuesday, 28 March 2017 2:31 PM  
**To:** Renee Prochazka <[renee@drcenviro.com.au](mailto:renee@drcenviro.com.au)>; [EnviroSampleNSW@eurofins.com](mailto:EnviroSampleNSW@eurofins.com)  
**Subject:** RE: Eurofins | mgt Sample Receipt Advice - Report 539755 : Site DUNHEVED CIRCUIT (ST MARYS)

Hi Renee

As per COC analysis asked for asbestos is Asbestos-WA analysis which requires approx. 500ml of sample (i.e. 700-800 gms) for which zip-lock bags were used, whereas for Foreign Materials about 4-6 kgs of sample is required. Small Asbestos bags can just be used for Asbestos Absence/Presence analysis. Please provide further instructions.  
Thanks

Rupan Virk  
Sample Receipt | NSW

Phone : +61 2 9900 8400

Email : [RupanVirk@eurofins.com](mailto:RupanVirk@eurofins.com)

---

**From:** Renee Prochazka [mailto:[renee@drcenviro.com.au](mailto:renee@drcenviro.com.au)]  
**Sent:** Tuesday, 28 March 2017 7:54 AM  
**To:** !AU04\_CAU001\_EnviroSampleNSW  
**Subject:** RE: Eurofins | mgt Sample Receipt Advice - Report 539755 : Site DUNHEVED CIRCUIT (ST MARYS)

There should have been asbestos (small) bags provided for all those samples listed.  
As for FM bags, I just used zip lock bags for that analysis.... They should have been double bagged in the esky.

Regards  
Renee

---

**From:** [envirosamplensw@eurofins.com](mailto:envirosamplensw@eurofins.com) [mailto:[envirosamplensw@eurofins.com](mailto:envirosamplensw@eurofins.com)]  
**Sent:** Monday, 27 March 2017 8:38 PM  
**To:** Patrick Baldwin <[patrick@drcenviro.com.au](mailto:patrick@drcenviro.com.au)>  
**Cc:** Renee Prochazka <[renee@drcenviro.com.au](mailto:renee@drcenviro.com.au)>  
**Subject:** Eurofins | mgt Sample Receipt Advice - Report 539755 : Site DUNHEVED CIRCUIT (ST MARYS)

## Alena Bounkeua

---

**To:** Mary Makarios  
**Subject:** RE: Eurofins | mgt Sample Receipt Advice - Report 539755 : Site DUNHEVED CIRCUIT (ST MARYS)

---

**From:** Mary Makarios  
**Sent:** Thursday, 30 March 2017 11:38 AM  
**To:** Charl Du Preez; Alena Bounkeua  
**Cc:** Rupan Virk  
**Subject:** RE: Eurofins | mgt Sample Receipt Advice - Report 539755 : Site DUNHEVED CIRCUIT (ST MARYS)

Anyway I spoke with the client and she said to remove the FM if we cannot do it and just do the R17 instead if she requested R16.thanks

Mary Makarios  
Phone : +61 3 8564 5088  
Email : [MaryMakarios@eurofins.com](mailto:MaryMakarios@eurofins.com)

---

**From:** Alena Bounkeua  
**Sent:** Thursday, 30 March 2017 11:12 AM  
**To:** Mary Makarios  
**Cc:** Charl Du Preez; Rupan Virk  
**Subject:** RE: Eurofins | mgt Sample Receipt Advice - Report 539755 : Site DUNHEVED CIRCUIT (ST MARYS)

Hi Mary,

How are we going about this job with foreign materials as only small bags were received.

Thanks

Alena Bounkeua  
**Sample Receipt | NSW**

Phone : +61 2 9900 8400

Email : [AlenaBounkeua@eurofins.com](mailto:AlenaBounkeua@eurofins.com)

---

**From:** Charl Du Preez  
**Sent:** Tuesday, 28 March 2017 11:01 AM  
**To:** Alena Bounkeua  
**Cc:** Mary Makarios  
**Subject:** FW: Eurofins | mgt Sample Receipt Advice - Report 539755 : Site DUNHEVED CIRCUIT (ST MARYS)

Can you please sort in collaboration with Mary?

Charl DuPreez  
Phone : +61 2 9900 8460  
Email : [CharlDuPreez@eurofins.com](mailto:CharlDuPreez@eurofins.com)

---

**From:** Renee Prochazka [<mailto:renee@drcenviro.com.au>]  
**Sent:** Tuesday, March 28, 2017 7:54 AM  
**To:** !AU04\_CAU001\_EnviroSampleNSW  
**Subject:** RE: Eurofins | mgt Sample Receipt Advice - Report 539755 : Site DUNHEVED CIRCUIT (ST MARYS)

There should have been asbestos (small) bags provided for all those samples listed.  
As for FM bags, I just used zip lock bags for that analysis.... They should have been double bagged in the esky.

Regards  
Renee

**From:** [envirosamplensw@eurofins.com](mailto:envirosamplensw@eurofins.com) [<mailto:envirosamplensw@eurofins.com>]  
**Sent:** Monday, 27 March 2017 8:38 PM  
**To:** Patrick Baldwin <[patrick@drcenviro.com.au](mailto:patrick@drcenviro.com.au)>  
**Cc:** Renee Prochazka <[renee@drcenviro.com.au](mailto:renee@drcenviro.com.au)>  
**Subject:** Eurofins | mgt Sample Receipt Advice - Report 539755 : Site DUNHEVED CIRCUIT (ST MARYS)

No Foreign Material Bags Provided hence analysis changed to R17. No asbestos WA bags(500ml) provided for TP11\_0.2, TP12\_0.1, TP13\_0.1, TP15\_0.1, TP16\_0.2, TP17\_0.2, TP18\_0.2, QC01\_250317, TP19 hence WA analysis cancelled. TB02\_250317 not received hence analysis cancelled. Sample TP11\_2.9 received as broken jar, cannot be salvaged, hence cancelled.

Dear Valued Client,

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 | mgt Analytical Services Manager as soon as possible to make certain that they get changed.

Regards

Rupar Virk  
**Sample Receipt**

**Eurofins | mgt**  
Unit F3, Parkview Building  
16 Mars Road  
LANE COVE WEST NSW 2066  
AUSTRALIA  
Phone: +61 299 008 400  
Email: [EnviroSampleNSW@eurofins.com](mailto:EnviroSampleNSW@eurofins.com)  
Website: [environment.eurofins.com.au](http://environment.eurofins.com.au)  
[EnviroNote 1068 - Eurofins Perth Laboratory](#)  
[EnviroNote 1069 - Eurofins Overnight TAT](#)

[EnviroNote 1071 - QSM 5.1](#)

[EnviroNote 1069 - Eurofins Overnight TAT](#)

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# CHAIN OF CUSTODY DOCUMENTATION



CLIENT: DRC Environmental Pty Ltd

SAMPLER:

ADDRESS / OFFICE: G6 / 79-109 Manningham Road, Bulleen VIC 3105

MOBILE:

PROJECT MANAGER (PM): Patrick Baldwin

PHONE:

PROJECT ID:

EMAIL REPORT TO: patrick@drcenviro.com.au poppy@drcenviro.com.au

SITE: P.O. NO.:

EMAIL INVOICE TO: (if different to report):

RESULTS REQUIRED (Date): QUOTE NO.:

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

FOR USE BY STORAGE ONLY  
COOLERS (check appropriate)  
INSULATED: Yes No N/A  
SAMPLE TEMPERATURE:  
CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

R12 R16 R17  
Asbestos MERM  
TRAC con  
HOLD

Notes: e.g. Highly contaminated samples  
e.g. "High PAHs expected".  
Extra volume for QC or trace LORs etc.

SAMPLE INFORMATION (note: S = Soil, W=Water) CONTAINER INFORMATION

ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles
	TP18 - 0.2	S	25/3		J+Asb.	
	TP18 - 2.5				J#	
	QC01-250317				J+Asb	
1	QC02-250317				J-Asb	
	QC03-250317				J	
2	QC04-250317				J	
	TP19 - 0.2				J	
	TP19 - 3.5				J	
	TB03 - 250317	W			2x vials	
	TB04 - 250317				2 vials	
	TP19				Asb.	

Subcon / Forward Lab / Split WO  
Lab Analysis:  
Organised By / Date: Newell  
Relinquished By / Date: Arbutnot  
Copies to Courier:  
WO No.  
Attach By PO / Internal Sheet:

Please fwd to ALS  
Please fwd to ALS

Name:  
Of:  
Name:  
Of:  
Water Container Codes:  
V = VOA Vial HCl Preserved; V  
Z = Zinc Acetate Preserved Be

Environmental Division  
Sydney  
Work Order Reference  
**ES1707373**



Telephone : - 61-2-8/94 8655

RECEIVED BY		METHOD OF SHIPMENT	
Date:	Name: <i>ALS</i>	Date: 27/3	Con' Note No:
Time:	Of: <i>ALS</i>	Time: 11:20 AM	
Date:	Name: <i>J. Crealy</i>	Date: 28/3/17	Transport Co:
Time:	Of: <i>ALS</i>	Time: 12:50	

Plastic; ORG = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved;  
inc Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;  
Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

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## APPENDIX F – QUALITY ASSURANCE AND QUALITY CONTROL REPORT AND PROUCL CALCULATIONS

# DETAILED SITE INVESTIGATION, 65-73 DUNHEVED CIRCUIT, ST MARYS

## QUALITY ASSURANCE AND QUALITY CONTROL REPORT

A quality assurance/quality control (QA/QC) program was implemented as part of field procedures, which were based on recommended procedures and sample collection methodologies detailed in the following publications:

- Standards Australia (1999) Guide to the Sampling and Investigation of Potentially Contaminated Soil. Part 2: Volatile Substances. Australian Standard AS 4482.2-1999.
- Standards Australia (2005) Guide to the Sampling and Investigation of Potentially Contaminated Soil. Part 1: Non-volatile and Semi-volatile Compounds. Australian Standard AS 4482.1-2005.
- National Environment Protection Council (1999) National Environment Protection (Assessment of site Contamination) Measure, December 1999. May 2013 Amendment.
- ANZECC & NHMRC (January 1992) Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites. Australian and New Zealand Environment & Conservation Council/National Health and Medical Research Council.

The QA/QC program undertaken as part of the assessment by DRC included the following:

- Implementation of field procedures for sampling equipment decontamination between sampling points.
- Preservation of samples with ice during field activities and transport from the field to the laboratory.
- Transportation of samples with accompanying chain of custody (COC) documentation.
- Collection of blind and split duplicate samples and calculation and review of relative percent difference (RPDs).
- Collection and review of trip blank samples.
- Compliance with recommended sample holding times.
- Review of laboratory internal QA/QC data including analysis of blanks, spikes and duplicates.

## DECONTAMINATION PROCEDURES

Soil samples were taken by hand from the excavator bucket, using new nitrile gloves for each sample. Care was taken to make sure soil samples were taken from bulk soil in the excavator bucket that had not touched the sides of the bucket. Based on the sampling method no decontamination of equipment was required.

No rinsate samples were taken off equipment during the field works, however based on the single natured use of the majority of the equipment, DRC does not consider it to impact the overall data quality at the site.

## SAMPLE LABELLING AND ANALYSIS

Each sample was provided with an individual sample ID and placed in the appropriate laboratory provided containers. Asbestos samples were provided in ziplock bags.

## FIELD QC SAMPLING PROGRAM

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

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

$$\text{RPD (\%)} = \frac{\langle C_o - C_s \rangle}{\left\langle \frac{C_o + C_s}{2} \right\rangle} \times 100$$

where  $C_o$  = concentration obtained from the original sample

$C_s$  = 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 30% to 50% limit, correlation of data between the sample pair is considered poor. Where any duplicate or split pair result had one sample that was reported to be below the limit of reporting and the other was positive, then the limit of reporting divided by two was used for calculation of the RPD.

The duplicate pairs and analytical program are summarised in **Table 1** below.

**Table 1: QA/QC Sampling Program**

Sample Type	Date Sampled	Primary ID	Replicate ID	Replicated Analysis
<b>Soil</b>				
Intralab Duplicate	25 March 2017	TP18_0.2	QC01_250317	TRH, BTEX, metals, PAH/phenols, inorganics
Interlab Duplicate			QC02_250317	
Intralab Duplicate	25 March 2017	TP17_3.5	QC03_250317	TRH, BTEX, metals, PAH/phenols, inorganics
Interlab Duplicate			QC04_250317	
<b>Blanks</b>				
Trip Blank	24 March 2017	TB01	-	TRH, BTEX, naphthalene
Trip Blank	25 March 2017	TB03_250317	-	
Trip Blank		TB04_250317	-	

In accordance with AS4482.1 (2005) the soil quality control samples were collected for every 20 primary samples. A full table of RPDs calculated for the blind duplicate pairs and inter-laboratory split pairs have been tabulated (attached **Tables 3**).

A total of 39 soil samples were taken with 2 intra-laboratory and 2 inter-laboratory QAQC samples analysed which meets the required AS4482.1 guidelines.

## TRIP BLANKS

Trip blank samples were generally collected on days of field work and were analysed to ensure that there was no cross contamination of substances whilst en-route to the nominated laboratories.

Trip blank samples were generally analysed for each day of sampling and were considered sufficient to demonstrate the effectiveness of field procedures employed.

Analyte concentrations for trip blank samples were all below the limits of reporting.

Results of laboratory analysis of trip blank samples have been tabulated (**Table 2**), full copies of NATA certified laboratory transcripts are provided in **Appendix D**.

## RPD CALCULATIONS

An RPD was calculated for each replicate analyte pair and these are provided in the **Tables Section** of this report. In some cases, RPDs were reported above the typical range of 30-50% provided in AS4482.1 (2005). Each elevated RPD is listed and discussed below.

### RPD Calculations for Soil Replicate Samples

**Table 2: Summary of Soil Assessment Elevated RPDs**

Primary Sample	Replicate Sample	Analyte	RPD	Discussion Code
TP17_3.5	QC03_250317	Conductivity	69	b
		Lead	53	b
		Chromium (III+VI)	67	a
	QC04_250317	Lead	80	b
		Chromium (III+VI)	75	a
		Copper	60	a
TP18_0.2	QC01_250317	Copper	53	a
	QC02_250317	Zinc	56	a

### Discussion Codes

- a the RPD is greater than 50%, the results are lower than 10x the LOR and are therefore not considered an exceedance in accordance with AS4482.1 (2005).
- b The replicate pairs showed variance, due to the RPDs being within a similar order of magnitude the variance is not considered to have affected the interpretation of the results, the maximum concentrations have been incorporated in our considerations.

Although there was one slight discrepancy between the primary laboratory and secondary laboratory, overall DRC are of the opinion that it does not alter the validity of the data set obtained given the concentrations are less than the adopted investigation levels.

## COMPLIANCE WITH RECOMMENDED HOLDING-TIMES

Samples were immediately forwarded to the laboratory on the day of collection, or, where that was not possible, on the following day, with samples held in refrigeration overnight or iced daily.

Soil samples were generally analysed within applicable laboratory accepted holding times.

## LABORATORY INTERNAL QUALITY CONTROL

Eurofins Pty Ltd and ALS Environmental Pty Ltd conducted their own internal QC programs including sample duplicates, spike recoveries, and method blanks in accordance with NATA certification requirements. A summary of the results of the laboratory internal quality control is provided in **Table 4**.

**Table 4: Summary of Laboratory Internal Quality Control Results**

Laboratory	Method Blank	Spike Percentage Recoveries	Internal Duplicate RPD	Comments
Eurofins	All non-detect	Spike % <ul style="list-style-type: none"> <li>539755 cyanide failed due to matrix interference.</li> </ul>	All non-detect or within acceptable limits	-
ALS	All non-detect	No outliers	All non-detect or within acceptable limits	-

Laboratory quality control data was concluded by the laboratory to meet their own internal quality requirements and all laboratories were accredited by NATA for the analysis undertaken (where NATA accreditation is available).

## CONCLUSIONS OF QA/QC PROGRAM

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

- The internal laboratory quality control program reported acceptable results.
- The field sampling procedure was carried out in general accordance with the DRC QA/QC program.
- The RPDs for blind and split samples were acceptable, although a few elevated RPD (>50%) were noted. However, these are not considered to impact on the integrity of the data set.
- Laboratories used were NATA accredited for the analyses performed.
- Samples were analysed within the applicable holding times.

DRC considers that the sampling and analytical programs were acceptable and the results obtained are of reliable quality.

User Selected Options

Date/Time of Computation 26/04/2017 3:02:04 PM  
 From File WorkSheet.xls  
 Full Precision OFF  
 Confidence Coefficient 95%  
 Number of Bootstrap Operations 2000

**Benzo(a) pyrene**

**General Statistics**

Total Number of Observations	43	Number of Distinct Observations	5
		Number of Missing Observations	1
Number of Detects	4	Number of Non-Detects	39
Number of Distinct Detects	4	Number of Distinct Non-Detects	1
Minimum Detect	0.8	Minimum Non-Detect	0.5
Maximum Detect	3.7	Maximum Non-Detect	0.5
Variance Detects	1.75	Percent Non-Detects	90.7%
Mean Detects	1.75	SD Detects	1.323
Median Detects	1.25	CV Detects	0.756
Skewness Detects	1.797	Kurtosis Detects	3.335
Mean of Logged Detects	0.379	SD of Logged Detects	0.66

**Normal GOF Test on Detects Only**

Shapiro Wilk Test Statistic	0.795	<b>Shapiro Wilk GOF Test</b>
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.354	<b>Lilliefors GOF Test</b>
5% Lilliefors Critical Value	0.443	Detected Data appear Normal at 5% Significance Level

**Detected Data appear Normal at 5% Significance Level**

**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**

Mean	0.616	Standard Error of Mean	0.0887
SD	0.504	95% KM (BCA) UCL	N/A
<b>95% KM (t) UCL</b>	<b>0.766</b>	<b>95% KM (Percentile Bootstrap) UCL</b>	<b>N/A</b>
95% KM (z) UCL	0.762	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.882	95% KM Chebyshev UCL	1.003
97.5% KM Chebyshev UCL	1.17	99% KM Chebyshev UCL	1.499

**Gamma GOF Tests on Detected Observations Only**

A-D Test Statistic	0.428	<b>Anderson-Darling GOF Test</b>
5% A-D Critical Value	0.659	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.317	<b>Kolmogrov-Smirnoff GOF</b>
5% K-S Critical Value	0.397	Detected data appear Gamma Distributed at 5% Significance Level

**Detected data appear Gamma Distributed at 5% Significance Level**

**Gamma Statistics on Detected Data Only**

k hat (MLE)	2.928	k star (bias corrected MLE)	0.899
Theta hat (MLE)	0.598	Theta star (bias corrected MLE)	1.947
nu hat (MLE)	23.42	nu star (bias corrected)	7.189
MLE Mean (bias corrected)	1.75	MLE Sd (bias corrected)	1.846

**Gamma Kaplan-Meier (KM) Statistics**

k hat (KM)	1.496	nu hat (KM)	128.6
Approximate Chi Square Value (128.63, $\alpha$ )	103.4	Adjusted Chi Square Value (128.63, $\beta$ )	102.7
95% Gamma Approximate KM-UCL (use when $n \geq 50$ )	0.766	95% Gamma Adjusted KM-UCL (use when $n < 50$ )	0.772

**Gamma ROS Statistics using Imputed Non-Detects**

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.172
Maximum	3.7	Median	0.01
SD	0.622	CV	3.618
k hat (MLE)	0.291	k star (bias corrected MLE)	0.286
Theta hat (MLE)	0.59	Theta star (bias corrected MLE)	0.6
nu hat (MLE)	25.04	nu star (bias corrected)	24.62
MLE Mean (bias corrected)	0.172	MLE Sd (bias corrected)	0.321
		Adjusted Level of Significance ( $\beta$ )	0.0444
Approximate Chi Square Value (24.62, $\alpha$ )	14.32	Adjusted Chi Square Value (24.62, $\beta$ )	14.05
95% Gamma Approximate UCL (use when $n \geq 50$ )	0.295	95% Gamma Adjusted UCL (use when $n < 50$ )	N/A

**Lognormal GOF Test on Detected Observations Only**

Shapiro Wilk Test Statistic	0.913	<b>Shapiro Wilk GOF Test</b>
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.276	<b>Lilliefors GOF Test</b>
5% Lilliefors Critical Value	0.443	Detected Data appear Lognormal at 5% Significance Level

**Detected Data appear Lognormal at 5% Significance Level**

**Lognormal ROS Statistics Using Imputed Non-Detects**

Mean in Original Scale	0.219	Mean in Log Scale	-3.659
SD in Original Scale	0.616	SD in Log Scale	2.233
95% t UCL (assumes normality of ROS data)	0.377	95% Percentile Bootstrap UCL	0.388
95% BCA Bootstrap UCL	0.467	95% Bootstrap t UCL	0.632
95% H-UCL (Log ROS)	1.238		

**UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed**

KM Mean (logged)	-0.593	95% H-UCL (KM -Log)	0.651
KM SD (logged)	0.357	95% Critical H Value (KM-Log)	1.81
KM Standard Error of Mean (logged)	0.0629		

**DL/2 Statistics**

<b>DL/2 Normal</b>		<b>DL/2 Log-Transformed</b>	
Mean in Original Scale	0.39	Mean in Log Scale	-1.222
SD in Original Scale	0.565	SD in Log Scale	0.548
95% t UCL (Assumes normality)	0.534	95% H-Stat UCL	0.403

**DL/2 is not a recommended method, provided for comparisons and historical reasons**

**Nonparametric Distribution Free UCL Statistics**

**Detected Data appear Normal Distributed at 5% Significance Level**

**Suggested UCL to Use**

95% KM (t) UCL	0.766	95% KM (Percentile Bootstrap) UCL	N/A
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**Warning: One or more Recommended UCL(s) not available!**

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

**General Statistics**

Total Number of Observations	43	Number of Distinct Observations	9
		Number of Missing Observations	1
Number of Detects	10	Number of Non-Detects	33
Number of Distinct Detects	9	Number of Distinct Non-Detects	1
Minimum Detect	100	Minimum Non-Detect	100
Maximum Detect	5500	Maximum Non-Detect	100
Variance Detects	2782939	Percent Non-Detects	76.74%
Mean Detects	855	SD Detects	1668
Median Detects	215	CV Detects	1.951
Skewness Detects	2.93	Kurtosis Detects	8.826
Mean of Logged Detects	5.757	SD of Logged Detects	1.296

**Normal GOF Test on Detects Only**

Shapiro Wilk Test Statistic	0.517	<b>Shapiro Wilk GOF Test</b>
5% Shapiro Wilk Critical Value	0.842	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.349	<b>Lilliefors GOF Test</b>
5% Lilliefors Critical Value	0.28	Detected Data Not Normal at 5% Significance Level

**Detected Data Not Normal at 5% Significance Level**

**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**

Mean	275.6	Standard Error of Mean	133
SD	827.2	<b>95% KM (BCA) UCL</b>	<b>518.4</b>
95% KM (t) UCL	499.2	95% KM (Percentile Bootstrap) UCL	527.9
95% KM (z) UCL	494.3	95% KM Bootstrap t UCL	1793
90% KM Chebyshev UCL	674.5	95% KM Chebyshev UCL	855.2
97.5% KM Chebyshev UCL	1106	99% KM Chebyshev UCL	1599

**Gamma GOF Tests on Detected Observations Only**

A-D Test Statistic	1.116	<b>Anderson-Darling GOF Test</b>
5% A-D Critical Value	0.767	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.3	<b>Kolmogrov-Smirnoff GOF</b>
5% K-S Critical Value	0.279	Detected Data Not Gamma Distributed at 5% Significance Level

**Detected Data Not Gamma Distributed at 5% Significance Level**

**Gamma Statistics on Detected Data Only**

k hat (MLE)	0.619	k star (bias corrected MLE)	0.5
Theta hat (MLE)	1382	Theta star (bias corrected MLE)	1711
nu hat (MLE)	12.37	nu star (bias corrected)	9.993
MLE Mean (bias corrected)	855	MLE Sd (bias corrected)	1210

**Gamma Kaplan-Meier (KM) Statistics**

k hat (KM)	0.111	nu hat (KM)	9.546
Approximate Chi Square Value (9.55, $\alpha$ )	3.66	Adjusted Chi Square Value (9.55, $\beta$ )	3.534
95% Gamma Approximate KM-UCL (use when $n \geq 50$ )	718.8	95% Gamma Adjusted KM-UCL (use when $n < 50$ )	744.4

**Gamma ROS Statistics using Imputed Non-Detects**

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	198.8
Maximum	5500	Median	0.01
SD	854.4	CV	4.297
k hat (MLE)	0.107	k star (bias corrected MLE)	0.115
Theta hat (MLE)	1850	Theta star (bias corrected MLE)	1722
nu hat (MLE)	9.242	nu star (bias corrected)	9.93
MLE Mean (bias corrected)	198.8	MLE Sd (bias corrected)	585.2
		Adjusted Level of Significance ( $\beta$ )	0.0444
Approximate Chi Square Value (9.93, $\alpha$ )	3.898	Adjusted Chi Square Value (9.93, $\beta$ )	3.767
95% Gamma Approximate UCL (use when $n \geq 50$ )	506.5	95% Gamma Adjusted UCL (use when $n < 50$ )	524.1

**Lognormal GOF Test on Detected Observations Only**

Shapiro Wilk Test Statistic	0.854	<b>Shapiro Wilk GOF Test</b>
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.216	<b>Lilliefors GOF Test</b>
5% Lilliefors Critical Value	0.28	Detected Data appear Lognormal at 5% Significance Level

**Detected Data appear Lognormal at 5% Significance Level**

**Lognormal ROS Statistics Using Imputed Non-Detects**

Mean in Original Scale	204.4	Mean in Log Scale	1.667
SD in Original Scale	853.1	SD in Log Scale	3.062
95% t UCL (assumes normality of ROS data)	423.2	95% Percentile Bootstrap UCL	437.3
95% BCA Bootstrap UCL	601.6	95% Bootstrap t UCL	1625
95% H-UCL (Log ROS)	6861		

**UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed**

KM Mean (logged)	4.873	95% H-UCL (KM -Log)	225.5
KM SD (logged)	0.767	95% Critical H Value (KM-Log)	2.124
KM Standard Error of Mean (logged)	0.123		

**DL/2 Statistics**

<b>DL/2 Normal</b>		<b>DL/2 Log-Transformed</b>	
Mean in Original Scale	237.2	Mean in Log Scale	4.341
SD in Original Scale	845.4	SD in Log Scale	0.991
95% t UCL (Assumes normality)	454.1	95% H-Stat UCL	179.7

**DL/2 is not a recommended method, provided for comparisons and historical reasons**

**Nonparametric Distribution Free UCL Statistics**

**Detected Data appear Lognormal Distributed at 5% Significance Level**

**Suggested UCL to Use**

**95% KM (BCA) UCL 518.4**

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

**General Statistics**

Total Number of Observations	43	Number of Distinct Observations	14
		Number of Missing Observations	1
Number of Detects	14	Number of Non-Detects	29
Number of Distinct Detects	13	Number of Distinct Non-Detects	1
Minimum Detect	110	Minimum Non-Detect	100
Maximum Detect	22000	Maximum Non-Detect	100
Variance Detects	34975732	Percent Non-Detects	67.44%
Mean Detects	2236	SD Detects	5914
Median Detects	200	CV Detects	2.644
Skewness Detects	3.337	Kurtosis Detects	11.47
Mean of Logged Detects	5.945	SD of Logged Detects	1.559

**Normal GOF Test on Detects Only**

Shapiro Wilk Test Statistic	0.416	<b>Shapiro Wilk GOF Test</b>
5% Shapiro Wilk Critical Value	0.874	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.468	<b>Lilliefors GOF Test</b>
5% Lilliefors Critical Value	0.237	Detected Data Not Normal at 5% Significance Level

**Detected Data Not Normal at 5% Significance Level**

**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**

Mean	795.6	Standard Error of Mean	538.4
SD	3402	95% KM (BCA) UCL	1790
95% KM (t) UCL	1701	95% KM (Percentile Bootstrap) UCL	1810
95% KM (z) UCL	1681	95% KM Bootstrap t UCL	23901
90% KM Chebyshev UCL	2411	<b>95% KM Chebyshev UCL</b>	<b>3143</b>
97.5% KM Chebyshev UCL	4158	99% KM Chebyshev UCL	6153

**Gamma GOF Tests on Detected Observations Only**

A-D Test Statistic	2.615	<b>Anderson-Darling GOF Test</b>
5% A-D Critical Value	0.817	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.403	<b>Kolmogrov-Smirnoff GOF</b>
5% K-S Critical Value	0.245	Detected Data Not Gamma Distributed at 5% Significance Level

**Detected Data Not Gamma Distributed at 5% Significance Level**

**Gamma Statistics on Detected Data Only**

k hat (MLE)	0.376	k star (bias corrected MLE)	0.343
Theta hat (MLE)	5948	Theta star (bias corrected MLE)	6519
nu hat (MLE)	10.53	nu star (bias corrected)	9.605
MLE Mean (bias corrected)	2236	MLE Sd (bias corrected)	3818

**Gamma Kaplan-Meier (KM) Statistics**

k hat (KM)	0.0547	nu hat (KM)	4.702
Approximate Chi Square Value (4.70, $\alpha$ )	1.017	Adjusted Chi Square Value (4.70, $\beta$ )	0.96
95% Gamma Approximate KM-UCL (use when $n \geq 50$ )	3678	95% Gamma Adjusted KM-UCL (use when $n < 50$ )	3895

**Gamma (KM) may not be used when k hat (KM) is < 0.1**

**Gamma ROS Statistics using Imputed Non-Detects**

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	728.1
Maximum	22000	Median	0.01
SD	3457	CV	4.748
k hat (MLE)	0.104	k star (bias corrected MLE)	0.112
Theta hat (MLE)	6994	Theta star (bias corrected MLE)	6481
nu hat (MLE)	8.953	nu star (bias corrected)	9.662
MLE Mean (bias corrected)	728.1	MLE Sd (bias corrected)	2172
		Adjusted Level of Significance ( $\beta$ )	0.0444
Approximate Chi Square Value (9.66, $\alpha$ )	3.732	Adjusted Chi Square Value (9.66, $\beta$ )	3.604
95% Gamma Approximate UCL (use when $n \geq 50$ )	1885	95% Gamma Adjusted UCL (use when $n < 50$ )	1952

**Lognormal GOF Test on Detected Observations Only**

Shapiro Wilk Test Statistic	0.734	<b>Shapiro Wilk GOF Test</b>
5% Shapiro Wilk Critical Value	0.874	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.256	<b>Lilliefors GOF Test</b>
5% Lilliefors Critical Value	0.237	Detected Data Not Lognormal at 5% Significance Level

**Detected Data Not Lognormal at 5% Significance Level**

**Lognormal ROS Statistics Using Imputed Non-Detects**

Mean in Original Scale	733.9	Mean in Log Scale	2.512
SD in Original Scale	3456	SD in Log Scale	3.061
95% t UCL (assumes normality of ROS data)	1620	95% Percentile Bootstrap UCL	1749
95% BCA Bootstrap UCL	2609	95% Bootstrap t UCL	19619
95% H-UCL (Log ROS)	15896		

**DL/2 Statistics**

<b>DL/2 Normal</b>		<b>DL/2 Log-Transformed</b>	
Mean in Original Scale	761.9	Mean in Log Scale	4.574
SD in Original Scale	3450	SD in Log Scale	1.297
95% t UCL (Assumes normality)	1647	95% H-Stat UCL	386.6

**DL/2 is not a recommended method, provided for comparisons and historical reasons**

**Nonparametric Distribution Free UCL Statistics**

**Data do not follow a Discernible Distribution at 5% Significance Level**

**Suggested UCL to Use**

95% KM (Chebyshev) UCL 3143

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

**General Statistics**

Total Number of Observations	41	Number of Distinct Observations	4
		Number of Missing Observations	3
Number of Detects	3	Number of Non-Detects	38
Number of Distinct Detects	3	Number of Distinct Non-Detects	1
Minimum Detect	54	Minimum Non-Detect	50
Maximum Detect	800	Maximum Non-Detect	50
Variance Detects	183052	Percent Non-Detects	92.68%
Mean Detects	306	SD Detects	427.8
Median Detects	64	CV Detects	1.398
Skewness Detects	1.731	Kurtosis Detects	N/A
Mean of Logged Detects	4.944	SD of Logged Detects	1.51

**Warning: Data set has only 3 Detected Values.**

**This is not enough to compute meaningful or reliable statistics and estimates.**

**Normal GOF Test on Detects Only**

Shapiro Wilk Test Statistic	0.76	<b>Shapiro Wilk GOF Test</b>
5% Shapiro Wilk Critical Value	0.767	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.381	<b>Lilliefors GOF Test</b>
5% Lilliefors Critical Value	0.512	Detected Data appear Normal at 5% Significance Level

**Detected Data appear Approximate Normal at 5% Significance Level**

**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**

Mean	68.73	Standard Error of Mean	22.12
SD	115.6	95% KM (BCA) UCL	N/A
95% KM (t) UCL	106	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	105.1	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	135.1	95% KM Chebyshev UCL	165.1
97.5% KM Chebyshev UCL	206.9	99% KM Chebyshev UCL	288.8

**Gamma GOF Tests on Detected Observations Only**

**Not Enough Data to Perform GOF Test**

**Gamma Statistics on Detected Data Only**

k hat (MLE)	0.766	k star (bias corrected MLE)	N/A
Theta hat (MLE)	399.5	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	4.595	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

**Gamma Kaplan-Meier (KM) Statistics**

k hat (KM)	0.353	nu hat (KM)	28.96
		Adjusted Level of Significance ( $\beta$ )	0.0441
Approximate Chi Square Value (28.96, $\alpha$ )	17.68	Adjusted Chi Square Value (28.96, $\beta$ )	17.36
95% Gamma Approximate KM-UCL (use when $n \geq 50$ )	112.6	95% Gamma Adjusted KM-UCL (use when $n < 50$ )	114.7

**Lognormal GOF Test on Detected Observations Only**

Shapiro Wilk Test Statistic	0.797	<b>Shapiro Wilk GOF Test</b>
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.365	<b>Lilliefors GOF Test</b>
5% Lilliefors Critical Value	0.512	Detected Data appear Lognormal at 5% Significance Level

**Detected Data appear Lognormal at 5% Significance Level**

### Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	22.74	Mean in Log Scale	-5.518
SD in Original Scale	125.1	SD in Log Scale	5.456
95% t UCL (assumes normality of ROS data)	55.63	95% Percentile Bootstrap UCL	61.64
95% BCA Bootstrap UCL	85.39	95% Bootstrap t UCL	339.5
95% H-UCL (Log ROS)	26234556		

### UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	3.988	95% H-UCL (KM -Log)	66.98
KM SD (logged)	0.428	95% Critical H Value (KM-Log)	1.848
KM Standard Error of Mean (logged)	0.0819		

### DL/2 Statistics

#### DL/2 Normal

Mean in Original Scale	45.56
SD in Original Scale	121
95% t UCL (Assumes normality)	77.38

#### DL/2 Log-Transformed

Mean in Log Scale	3.345
SD in Log Scale	0.566
95% H-Stat UCL	39.64

**DL/2 is not a recommended method, provided for comparisons and historical reasons**

### Nonparametric Distribution Free UCL Statistics

**Detected Data appear Approximate Normal Distributed at 5% Significance Level**

### Suggested UCL to Use

95% KM (t) UCL	106	95% KM (Percentile Bootstrap) UCL	N/A
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**Warning: One or more Recommended UCL(s) not available!**

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

User Selected Options

Date/Time of Computation 26/04/2017 3:25:48 PM  
 From File WorkSheet.xls  
 Full Precision OFF  
 Confidence Coefficient 95%  
 Number of Bootstrap Operations 2000

**Benzo(a)pyrene TEQ (LOR)**

**General Statistics**

Total Number of Observations	43	Number of Distinct Observations	5
		Number of Missing Observations	1
Minimum	1.2	Mean	1.307
Maximum	3.4	Median	1.2
SD	0.396	Std. Error of Mean	0.0604
Coefficient of Variation	0.303	Skewness	4.335

**Normal GOF Test**

Shapiro Wilk Test Statistic	0.319
5% Shapiro Wilk Critical Value	0.943
Lilliefors Test Statistic	0.513
5% Lilliefors Critical Value	0.135

**Shapiro Wilk GOF Test**

Data Not Normal at 5% Significance Level

**Lilliefors GOF Test**

Data Not Normal at 5% Significance Level

**Data Not Normal at 5% Significance Level**

**Assuming Normal Distribution**

**95% Normal UCL**

95% Student's-t UCL 1.409

**95% UCLs (Adjusted for Skewness)**

95% Adjusted-CLT UCL (Chen-1995) 1.449  
 95% Modified-t UCL (Johnson-1978) 1.415

**Gamma GOF Test**

A-D Test Statistic	13.41
5% A-D Critical Value	0.748
K-S Test Statistic	0.521
5% K-S Critical Value	0.135

**Anderson-Darling Gamma GOF Test**

Data Not Gamma Distributed at 5% Significance Level

**Kolmogrov-Smirnoff Gamma GOF Test**

Data Not Gamma Distributed at 5% Significance Level

**Data Not Gamma Distributed at 5% Significance Level**

**Gamma Statistics**

k hat (MLE)	19.04	k star (bias corrected MLE)	17.73
Theta hat (MLE)	0.0686	Theta star (bias corrected MLE)	0.0737
nu hat (MLE)	1638	nu star (bias corrected)	1525
MLE Mean (bias corrected)	1.307	MLE Sd (bias corrected)	0.31
		Approximate Chi Square Value (0.05)	1435
Adjusted Level of Significance	0.0444	Adjusted Chi Square Value	1432

**Assuming Gamma Distribution**

95% Approximate Gamma UCL (use when n>=50) 1.389      95% Adjusted Gamma UCL (use when n<50) 1.392

**Lognormal GOF Test**

Shapiro Wilk Test Statistic	0.337
5% Shapiro Wilk Critical Value	0.943
Lilliefors Test Statistic	0.52
5% Lilliefors Critical Value	0.135

**Shapiro Wilk Lognormal GOF Test**

Data Not Lognormal at 5% Significance Level

**Lilliefors Lognormal GOF Test**

Data Not Lognormal at 5% Significance Level

**Data Not Lognormal at 5% Significance Level**

### Lognormal Statistics

Minimum of Logged Data	0.182	Mean of logged Data	0.241
Maximum of Logged Data	1.224	SD of logged Data	0.205

### Assuming Lognormal Distribution

95% H-UCL	1.372	90% Chebyshev (MVUE) UCL	1.422
95% Chebyshev (MVUE) UCL	1.477	97.5% Chebyshev (MVUE) UCL	1.555
99% Chebyshev (MVUE) UCL	1.706		

### Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

### Nonparametric Distribution Free UCLs

95% CLT UCL	1.406	95% Jackknife UCL	1.409
95% Standard Bootstrap UCL	1.404	95% Bootstrap-t UCL	1.539
95% Hall's Bootstrap UCL	1.459	95% Percentile Bootstrap UCL	1.419
95% BCA Bootstrap UCL	1.465		
90% Chebyshev(Mean, Sd) UCL	1.488	95% Chebyshev(Mean, Sd) UCL	1.57
97.5% Chebyshev(Mean, Sd) UCL	1.684	99% Chebyshev(Mean, Sd) UCL	1.908

### Suggested UCL to Use

95% Student's-t UCL	1.409	or 95% Modified-t UCL	1.415
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Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). However, simulation results will not cover all Real World data sets.

For additional insight the user may want to consult a statistician.

User Selected Options

Date/Time of Computation 1/05/2017 12:15:52 PM  
 From File WorkSheet.xls  
 Full Precision OFF  
 Confidence Coefficient 95%  
 Number of Bootstrap Operations 2000

TPH C10-C36

**General Statistics**

Total Number of Observations	43	Number of Distinct Observations	19
Number of Detects	19	Number of Non-Detects	24
Number of Distinct Detects	18	Number of Distinct Non-Detects	1
Minimum Detect	76	Minimum Non-Detect	50
Maximum Detect	26060	Maximum Non-Detect	50
Variance Detects	37282085	Percent Non-Detects	55.81%
Mean Detects	2060	SD Detects	6106
Median Detects	220	CV Detects	2.965
Skewness Detects	3.813	Kurtosis Detects	15.05
Mean of Logged Detects	5.816	SD of Logged Detects	1.507

**Normal GOF Test on Detects Only**

Shapiro Wilk Test Statistic	0.362	<b>Shapiro Wilk GOF Test</b>	
5% Shapiro Wilk Critical Value	0.901	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.48	<b>Lilliefors GOF Test</b>	
5% Lilliefors Critical Value	0.203	Detected Data Not Normal at 5% Significance Level	

**Detected Data Not Normal at 5% Significance Level**

**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**

Mean	938	Standard Error of Mean	638.4
SD	4075	95% KM (BCA) UCL	2131
95% KM (t) UCL	2012	95% KM (Percentile Bootstrap) UCL	2126
95% KM (z) UCL	1988	95% KM Bootstrap t UCL	21607
90% KM Chebyshev UCL	2853	<b>95% KM Chebyshev UCL</b>	<b>3721</b>
97.5% KM Chebyshev UCL	4925	99% KM Chebyshev UCL	7290

**Gamma GOF Tests on Detected Observations Only**

A-D Test Statistic	3.407	<b>Anderson-Darling GOF Test</b>	
5% A-D Critical Value	0.829	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.378	<b>Kolmogrov-Smirnoff GOF</b>	
5% K-S Critical Value	0.213	Detected Data Not Gamma Distributed at 5% Significance Level	

**Detected Data Not Gamma Distributed at 5% Significance Level**

**Gamma Statistics on Detected Data Only**

k hat (MLE)	0.368	k star (bias corrected MLE)	0.345
Theta hat (MLE)	5602	Theta star (bias corrected MLE)	5975
nu hat (MLE)	13.97	nu star (bias corrected)	13.1
MLE Mean (bias corrected)	2060	MLE Sd (bias corrected)	3508

**Gamma Kaplan-Meier (KM) Statistics**

k hat (KM)	0.053	nu hat (KM)	4.557
Approximate Chi Square Value (4.56, $\alpha$ )	0.953	Adjusted Chi Square Value (4.56, $\beta$ )	0.899
95% Gamma Approximate KM-UCL (use when $n \geq 50$ )	4483	95% Gamma Adjusted KM-UCL (use when $n < 50$ )	4754

Gamma (KM) may not be used when k hat (KM) is < 0.1

### Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	910.1
Maximum	26060	Median	0.01
SD	4129	CV	4.537
k hat (MLE)	0.117	k star (bias corrected MLE)	0.124
Theta hat (MLE)	7791	Theta star (bias corrected MLE)	7330
nu hat (MLE)	10.05	nu star (bias corrected)	10.68
MLE Mean (bias corrected)	910.1	MLE Sd (bias corrected)	2583
		Adjusted Level of Significance ( $\beta$ )	0.0444
Approximate Chi Square Value (10.68, $\alpha$ )	4.37	Adjusted Chi Square Value (10.68, $\beta$ )	4.23
95% Gamma Approximate UCL (use when $n \geq 50$ )	2224	95% Gamma Adjusted UCL (use when $n < 50$ )	2297

### Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.787	<b>Shapiro Wilk GOF Test</b>
5% Shapiro Wilk Critical Value	0.901	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.222	<b>Lilliefors GOF Test</b>
5% Lilliefors Critical Value	0.203	Detected Data Not Lognormal at 5% Significance Level

**Detected Data Not Lognormal at 5% Significance Level**

### Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	916.1	Mean in Log Scale	3.438
SD in Original Scale	4128	SD in Log Scale	2.63
95% t UCL (assumes normality of ROS data)	1975	95% Percentile Bootstrap UCL	2141
95% BCA Bootstrap UCL	2983	95% Bootstrap t UCL	20139
95% H-UCL (Log ROS)	6386		

### DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	924	Mean in Log Scale	4.366
SD in Original Scale	4126	SD in Log Scale	1.636
95% t UCL (Assumes normality)	1982	95% H-Stat UCL	665.7

**DL/2 is not a recommended method, provided for comparisons and historical reasons**

### Nonparametric Distribution Free UCL Statistics

**Data do not follow a Discernible Distribution at 5% Significance Level**

### Suggested UCL to Use

95% KM (Chebyshev) UCL 3721

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).


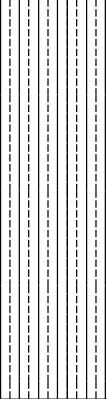
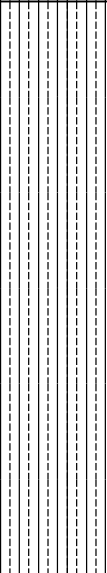

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

## APPENDIX G – TEST PIT LOGS

# TEST PIT LOG TP01

PROJECT No. 63-73 Dunheved Cir	DRILLING DATE 24/03/2017	X COORDINATE Refer to Site Layout Figure
SITE 63-73 Dunheved Cir, St Marys	LOGGED BY RP	Y COORDINATE Refer to Site Layout Figure
CLIENT Borg Manufacturing	TOTAL DEPTH 1.6 m	ELEVATION

LOCATION DISCRIPTION

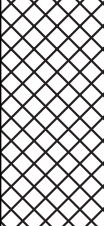
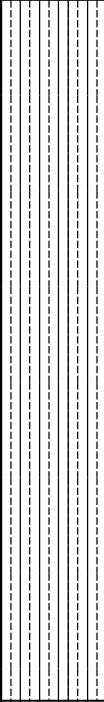
Depth (m)	Well Installation	Graphic Log	Material Description	Additional Observations	Consistency	Moisture Content	PID	Samples	Water	Elevation (m)
			Gravel with silt and clay; brown to black; low plasticity; loose; moist.		L	M				
			Silty CLAY with trace sand; brown / red / grey; small pieces of brick and gravel; medium plasticity; loose; dry to moist.	No odour or staining present.	L	D/M	0.7	TP01_0.1		
			Silty CLAY with trace sand; brown / red; lower clay content that previous; medium plasticity; loose; dry to moist.	Asbestos bag collected			0.8	TP01_0.7		
1			End of Test Pit @ 1.6 m BGL		L	D/M				1
							0.8	TP01_1.6		

Disclaimer This bore log is intended for environmental not geotechnical purposes.

# TEST PIT LOG TP02

PROJECT No. 63-73 Dunheved Cir	DRILLING DATE 24/03/2017	X COORDINATE Refer to Site Layout Figure
SITE 63-73 Dunheved Cir, St Marys	LOGGED BY RP	Y COORDINATE Refer to Site Layout Figure
CLIENT Borg Manufacturing	TOTAL DEPTH 1.4 m	ELEVATION

**LOCATION DISCRIPTION**

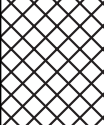
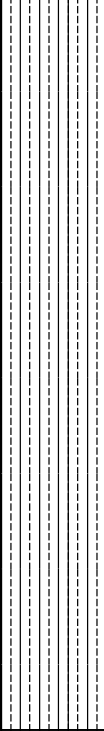
Depth (m)	Well Installation	Graphic Log	Material Description	Additional Observations	Consistency	Moisture Content	PID	Samples	Water	Elevation (m)
			Gravel / road-base, 20 mm sub-angular				0.4	TP02_0.05		
			Asphalt		H	M				
			Road base							
			Silty CLAY; grey with red and brown mottle; medium plasticity; hard; dry.	Asbestos bag collected						
				No odour or staining present.	H	D				
1							0.4	TP02_1.2		1
			End of Test Pit @ 1.4 m BGL							

Disclaimer This bore log is intended for environmental not geotechnical purposes.

# TEST PIT LOG TP03

PROJECT No. 63-73 Dunheved Cir	DRILLING DATE 24/03/2017	X COORDINATE Refer to Site Layout Figure
SITE 63-73 Dunheved Cir, St Marys	LOGGED BY RP	Y COORDINATE Refer to Site Layout Figure
CLIENT Borg Manufacturing	TOTAL DEPTH 1.3 m	ELEVATION

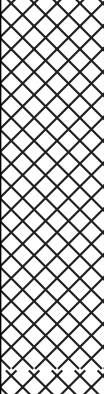
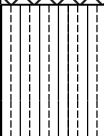
**LOCATION DISCRIPTION**

Depth (m)	Well Installation	Graphic Log	Material Description	Additional Observations	Consistency	Moisture Content	PID	Samples	Water	Elevation (m)
			Gravel / road-base		D	M	0.4	TP03_0.1		
			Silty CLAY; red; low to medium plasticity; dense; dry.	Asbestos bag collected	D	D				
1			Silty CLAY; grey with brown / orange mottle; loose; dry.	No odour or staining present.			0.5	TP03_1.0		1
			End of Test Pit @ 1.3 m BGL		D	D	1.2	TP03_1.2		

# TEST PIT LOG TP04

PROJECT No. 63-73 Dunheved Cir	DRILLING DATE 24/03/2017	X COORDINATE Refer to Site Layout Figure
SITE 63-73 Dunheved Cir, St Marys	LOGGED BY RP	Y COORDINATE Refer to Site Layout Figure
CLIENT Borg Manufacturing	TOTAL DEPTH 0.8 m	ELEVATION

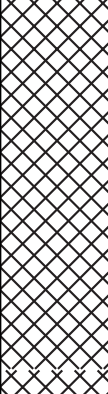
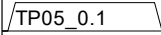
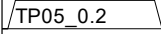


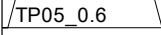

LOCATION DISCRIPTION

Depth (m)	Well Installation	Graphic Log	Material Description	Additional Observations	Consistency	Moisture Content	PID	Samples	Water	Elevation (m)
1			Gravel / road-base; FILL; sandy CLAY; bricks and dark brown concrete; dry.	<p>Ruptured storm water from site next door, abandoned hole.</p> <p>Asbestos bag collected</p>		D		TP04_0.2		1
			Silty CLAY; red / grey; medium plasticity; dry.	No odour or staining present.		D		TP04_0.6		
			End of Test Pit @ 0.8 m BGL							

# TEST PIT LOG TP05

PROJECT No. 63-73 Dunheved Cir	DRILLING DATE 24/03/2017	X COORDINATE Refer to Site Layout Figure
SITE 63-73 Dunheved Cir, St Marys	LOGGED BY RP	Y COORDINATE Refer to Site Layout Figure
CLIENT Borg Manufacturing	TOTAL DEPTH 1.0 m	ELEVATION

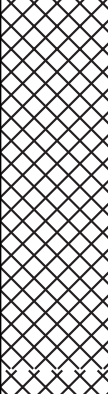

LOCATION DISCRIPTION

Depth (m)	Well Installation	Graphic Log	Material Description	Additional Observations	Consistency	Moisture Content	PID	Samples	Water	Elevation (m)
			Road-base / Crushed Rock					 		
			FILL: sandy CLAY; beige; sandstone cobbles, bricks and PVC.							
			FILL: sandy CLAY.							
			CLAY; red with grey mottle; medium plasticity; dense.	Asbestos bag collected						
				No odour or staining present.						
1			End of Test Pit @ 1.0 m BGL							1

# TEST PIT LOG TP06

PROJECT No. 63-73 Dunheved Cir	DRILLING DATE 24/03/2017	X COORDINATE Refer to Site Layout Figure
SITE 63-73 Dunheved Cir, St Marys	LOGGED BY RP	Y COORDINATE Refer to Site Layout Figure
CLIENT Borg Manufacturing	TOTAL DEPTH 0.9 m	ELEVATION

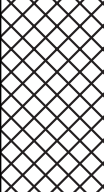


**LOCATION DISCRIPTION**

Depth (m)	Well Installation	Graphic Log	Material Description	Additional Observations	Consistency	Moisture Content	PID	Samples	Water	Elevation (m)
1			FILL: road-base; sandy CLAY; dark brown to black; concrete pieces; dry.	Staining on surface and a diesel odour.		D		TP06_0.1		1
			Sandy CLAY; red with grey mottle; dense; firm; dry	Asbestos bag collected	F/D	D	0.3	TP06_0.6		
			End of Test Pit @ 0.9 m BGL							

# TEST PIT LOG TP07

PROJECT No. 63-73 Dunheved Cir	DRILLING DATE 24/03/2017	X COORDINATE Refer to Site Layout Figure
SITE 63-73 Dunheved Cir, St Marys	LOGGED BY RP	Y COORDINATE Refer to Site Layout Figure
CLIENT Borg Manufacturing	TOTAL DEPTH 1.0 m	ELEVATION

LOCATION DISCRIPTION

Depth (m)	Well Installation	Graphic Log	Material Description	Additional Observations	Consistency	Moisture Content	PID	Samples	Water	Elevation (m)
			FILL: road-base; very compacted; angular gravels; hard; dry.				0.5	TP07_0.1		
			Sandy CLAY; dark brown; medium plasticity; stiff dense; stiff; dry.		St/D	D				
			Sandy CLAY; red with grey mottle; medium plasticity; dense; firm; dry.	Asbestos bag collected	F/D	D	0.5	TP07_0.6		
1			End of Test Pit @ 1.0 m BGL	No odour or staining present.						1

# TEST PIT LOG TP08

PROJECT No. 63-73 Dunheved Cir	DRILLING DATE 24/03/2017	X COORDINATE Refer to Site Layout Figure
SITE 63-73 Dunheved Cir, St Marys	LOGGED BY RP	Y COORDINATE Refer to Site Layout Figure
CLIENT Borg Manufacturing	TOTAL DEPTH 3.9 m	ELEVATION

LOCATION DISCRPTION

Depth (m)	Well Installation	Graphic Log	Material Description	Additional Observations	Consistency	Moisture Content	PID	Samples	Water	Elevation (m)
1			FILL: road-base FILL: sandy CLAY; brown with orange mottle; pieces of sandstone gravel with loose shale with clay clumps; low to medium plasticity.	Asbestos bag collected No odour or staining present	L	D	0.4	TP08_0.1		1
2							0.6	TP08_0.5		2
3							0.5	TP08_1.5		3
4			FILL: sandy SILT / shale; light brown; loose powdery. End of Test Pit @ 3.9 m BGL	Max reach of excavator, natural soil not encountered	L	D	0.7	TP08_3.9		4

Disclaimer This bore log is intended for environmental not geotechnical purposes.

# TEST PIT LOG TP09

PROJECT No. 63-73 Dunheved Cir	DRILLING DATE 24/03/2017	X COORDINATE Refer to Site Layout Figure
SITE 63-73 Dunheved Cir, St Marys	LOGGED BY RP	Y COORDINATE Refer to Site Layout Figure
CLIENT Borg Manufacturing	TOTAL DEPTH 3.9 m	ELEVATION

LOCATION DISCRIPTION

Depth (m)	Well Installation	Graphic Log	Material Description	Additional Observations	Consistency	Moisture Content	PID	Samples	Water	Elevation (m)
1			FILL: road-base	Brick and concrete prior to 0.4 m  Asbestos bag collected  No staining present	L	D	0.4	TP09_0.1		1
			FILL: silty CLAY; dark brown; sandstone cobbles; low plasticity; loose; dry.							
			FILL: silty CLAY; black to dark grey; sandstone cobbles; low plasticity; loose; dry.							
			FILL: clayey SAND; grey							
2			FILL: sandy CLAY; brown with black mottle; medium plasticity; dense; dry	2 m organic peaty odour noted  Concrete still present at 2.5 m			1.1	TP09_2.5		2
			End of Test Pit @ 2.8 m BGL							
3				Natural soil not encountered						3

Disclaimer This bore log is intended for environmental not geotechnical purposes.

# TEST PIT LOG TP10

PROJECT No. 63-73 Dunheved Cir	DRILLING DATE 24/03/2017	X COORDINATE Refer to Site Layout Figure
SITE 63-73 Dunheved Cir, St Marys	LOGGED BY RP	Y COORDINATE Refer to Site Layout Figure
CLIENT Borg Manufacturing	TOTAL DEPTH 2.8 m	ELEVATION

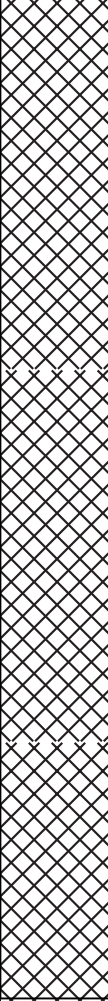
LOCATION DISCRIPTION

Depth (m)	Well Installation	Graphic Log	Material Description	Additional Observations	Consistency	Moisture Content	PID	Samples	Water	Elevation (m)
1			FILL: road-base FILL: sandy CLAY; red to brown; gravels; loose; dry.  FILL: sandy CLAY; grey band; concrete pieces; loose; dry.  FILL: sandy CLAY; red to brown; gravels; clayey cobbles; loose; dry	From 0.1 m tiles, VC pipe and bricks present.  Asbestos bag collected  No staining present  Bricks and concrete present at 1.3 m.	L	D	0.4	TP10_0.1		1
2			FILL: Sandy CLAY; red to brown; gravels; clayey cobbles; sandstone cobbles; loose; dry	Concrete present at 2.5 m slight decaying odour at 2.8 m						2
3			End of Test Pit @ 2.8 m BGL	Natural soil not encountered.			0.7	TP10_2.8		3

# TEST PIT LOG TP11

PROJECT No. 63-73 Dunheved Cir	DRILLING DATE 24/03/2017	X COORDINATE Refer to Site Layout Figure
SITE 63-73 Dunheved Cir, St Marys	LOGGED BY RP	Y COORDINATE Refer to Site Layout Figure
CLIENT Borg Manufacturing	TOTAL DEPTH 2.8 m	ELEVATION

## LOCATION DISCRIPTION

Depth (m)	Well Installation	Graphic Log	Material Description	Additional Observations	Consistency	Moisture Content	PID	Samples	Water	Elevation (m)
1			FILL: crushed rock FILL: clayey SAND; brown; loose; dry.  FILL: clayey SAND; dark brown; more clay; loose; dry.  FILL: silty CLAY; banded orange/ brown/ grey at different depth intervals; sand stone cobbles; loose; dry.	bricks, concrete and sandstone present at 0.2 m  slight oily odour at 0.7 m  Plastic, bricks and concrete pieces to 2 m	L	D	0	TP11_0.2		1
2							0.6	TP11_0.7		2
3			End of Test Pit @ 3.0 m BGL	Natural soil not encountered.			0.5	TP11_2.9		3



Disclaimer This bore log is intended for environmental not geotechnical purposes.

Page 1 of 1

# TEST PIT LOG TP12

PROJECT No. 63-73 Dunheved Cir	DRILLING DATE 24/03/2017	X COORDINATE Refer to Site Layout Figure
SITE 63-73 Dunheved Cir, St Marys	LOGGED BY RP	Y COORDINATE Refer to Site Layout Figure
CLIENT Borg Manufacturing	TOTAL DEPTH 3.2 m	ELEVATION

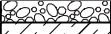
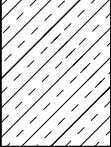
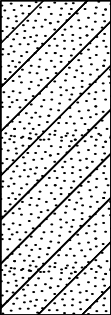
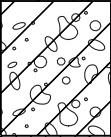
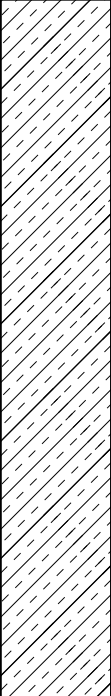

LOCATION DISCRIPTION

Depth (m)	Well Installation	Graphic Log	Material Description	Additional Observations	Consistency	Moisture Content	PID	Samples	Water	Elevation (m)
1			FILL: gravel / road-base.	Plastic at 0.2 m. Pieces of brick at 0.3 m.  concrete pieces at 1 m.	L	D	0.9	TP12_0.1		1
			FILL: silty CLAY with trace sand; dark brown; sandstone cobbles; low to medium plasticity; loose; dry.							
			FILL: silty CLAY with trace sand; brown with red mottle; sandstone cobbles; low to medium plasticity; loose; dry.							
2			FILL: silty CLAY; dark brown; low to medium plasticity; loose; dry.	Bricks and steel wire at 2 m.  Concrete at 2.3 m.			13.6	TP12_2.2		2
3				Burnt timber at 2.8 m.						3
				End of Test Pit @ 3.2 m BGL	Natural soil not encountered.			0.7	TP12_3.2	

## ENVIRONMENTAL TEST PIT LOG TP13

PROJECT No. Dunheved Circuit, St Marys	EQUIPMENTS & METHODS Test Pitting with Excavator	X COORDINATE Refer to site layout plan
SITE 65-87 Dunheved Circuit, St Marys, NSW		Y COORDINATE Refer to site layout plan
		ELEVATION 37.4
CLIENT Borg Manufacturing	DATE COMPLETED 25/03/17	
LOGGED BY RP		

**LOCATION DESCRIPTION**

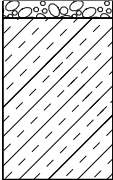

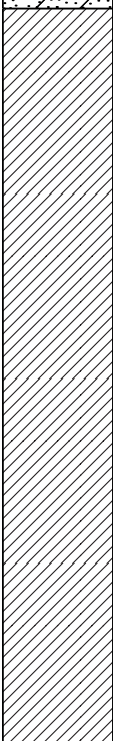
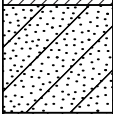
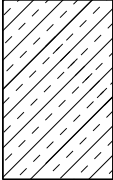
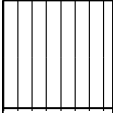
Graphic Log	Material Description	Depth (m)	PID	Samples	Consistency	Moisture	Additional Observations
	Gravel/Road base						
	FILL: silty CLAY; medium plasticity; brown orange		0.7	TP13_0.1	H	D	Small pieces of brick @ 0.1m Wire @ 0.2m
	FILL: sandy CLAY; dark brown with sandstone cobbles	1			L		
	FILL: sandy silty CLAY; grey; with small angular gravels		1.1	TP13_1.2	H		Concrete with rebar @ 1.2m
	FILL: silty CLAY; red brown; with sandstone cobbles	2			F		
	End of Test Pit @ 3.0m	3		TP13_2.9			



## ENVIRONMENTAL TEST PIT LOG TP15

PROJECT No. Dunheved Circuit, St Marys	EQUIPMENTS & METHODS Test Pitting with Excavator	X COORDINATE Refer to site layout plan
SITE 65-87 Dunheved Circuit, St Marys, NSW		Y COORDINATE Refer to site layout plan
		ELEVATION 37.4
CLIENT Borg Manufacturing	DATE COMPLETED 25/03/17	
LOGGED BY RP		

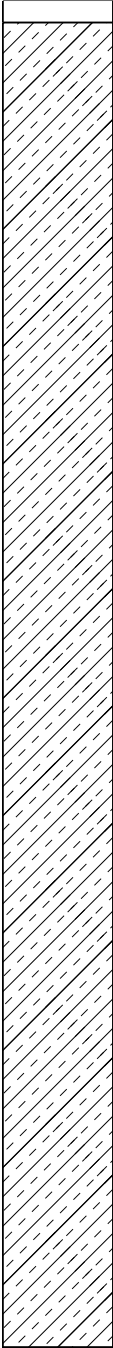
LOCATION DESCRIPTION SW corner of site

Graphic Log	Material Description	Depth (m)	PID	Samples	Consistency	Moisture	Additional Observations
	Gravel FILL: silty CLAY; medium plasticity; brown; with gravels	0.7		TP15_0.1	L	D	Bricks, sandstone cobbles, and tile pieces
	FILL: sandy CLAY; dark brown						
	FILL: silty CLAY; low to medium plasticity; brown; with some sand  Increasing clay content with depth	1					Concrete pieces @ 1.3m
	FILL: sandy CLAY; low to medium plasticity; dark brown	2		TP15_2.0			Concrete and sandstone boulders @ 2.0m
	FILL: silty CLAY; medium plasticity; dark brown with red mottles; trace sand	3			F		
	FILL: SILT; beige	0.7		TP15_3.5	S		Natural soil not encountered
	End of Test Pit @ 3.8m						

## ENVIRONMENTAL TEST PIT LOG TP16

PROJECT No. Dunheved Circuit, St Marys	EQUIPMENTS & METHODS Test Pitting with Excavator	X COORDINATE Refer to site layout plan
SITE 65-87 Dunheved Circuit, St Marys, NSW		Y COORDINATE Refer to site layout plan
		ELEVATION 37.4
CLIENT Borg Manufacturing	DATE COMPLETED 25/03/17	
LOGGED BY RP		


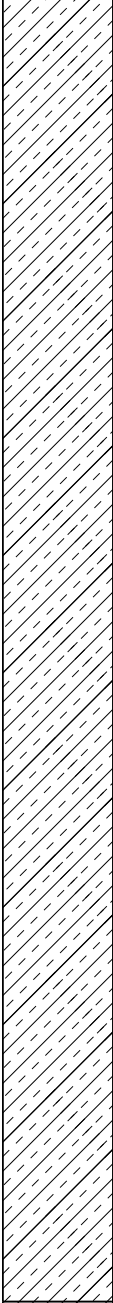
**LOCATION DESCRIPTION**

Graphic Log	Material Description	Depth (m)	PID	Samples	Consistency	Moisture	Additional Observations
	Grass						
	FILL: silty CLAY; medium plasticity; brown; with trace sand and sandstone gravels		0.5	TP16_0.2			sandstone cobbles present @ 0.2-0.5m
	FILL: silty CLAY; medium plasticity; brown with orange grey mottles	1	0.5	TP16_1.0			Timber and brick pieces @ 1.0m
	FILL: silty CLAY; low to medium plasticity; brown; with some sand  Becoming brown with orange red mottles and increasing clay content	2					Sandstone cobble and plastic @ 1.5m
	End of Test Pit @ 3.0m	3	0.6	TP16_3.0			Brick pieces @ 2.4-3.0m  Steel rod (~50cm) @ 2.7m  Natural soil not encountered

# ENVIRONMENTAL TEST PIT LOG TP17

PROJECT No. Dunheved Circuit, St Marys	EQUIPMENTS & METHODS Test Pitting with Excavator	X COORDINATE Refer to site layout plan
SITE 65-87 Dunheved Circuit, St Marys, NSW		Y COORDINATE Refer to site layout plan
		ELEVATION 37.4
CLIENT Borg Manufacturing	DATE COMPLETED 25/03/17	
LOGGED BY RP		


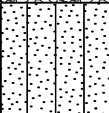

**LOCATION DESCRIPTION**

Graphic Log	Material Description	Depth (m)	PID	Samples	Consistency	Moisture	Additional Observations
	Gravel						
	FILL: silty CLAY; medium plasticity; brown with orange mottles; gravels and trace sand present		0.6	TP17_0.2			Plastic, brick pieces, concrete, and vitrified clay pipe @ 0.3m. Possible ACM placed in bag
		1					
	some grey mottles @ 2m and sandstone cobbles/gravels	2	0.6	TP17_1.5			
	becoming dark brown	3					
	End of Test Pit @ 3.5m		1.0	TP17_3.5			plastic pipe @ 3.0m  Timber pieces and shale cobbles @ 3.4m  Natural soil not encountered
				QC03/QC04			

## ENVIRONMENTAL TEST PIT LOG TP18

PROJECT No. Dunheved Circuit, St Marys	EQUIPMENTS & METHODS Test Pitting with Excavator	X COORDINATE Refer to site layout plan
SITE 65-87 Dunheved Circuit, St Marys, NSW		Y COORDINATE Refer to site layout plan
		ELEVATION 37.4
CLIENT Borg Manufacturing	DATE COMPLETED 25/03/17	
		LOGGED BY RP


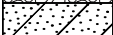
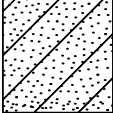
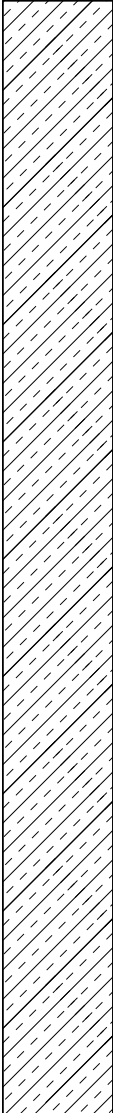
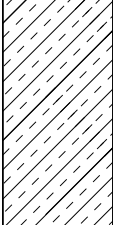
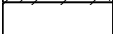
**LOCATION DESCRIPTION**

Graphic Log	Material Description	Depth (m)	PID	Samples	Consistency	Moisture	Additional Observations
	Gravel/Crushed Rock				L	D	Brick and concrete pieces present @ 0.2-0.5m  PVC and sandstone/shale cobbles @ 0.4m  Timber pieces and ceramic tiles @ 0.5m
	FILL: silty SAND; brown; medium grained; with brick and concrete pieces		0.6	TP18_0.2 QC01/QC02			
	FILL: silty CLAY; brown with orange red mottles	1			F		
	becoming dark brown with sand				L		Concrete pieces and shale cobbles @ 1.5m
		2					
	FILL: silty CLAY; medium plasticity; brown with red orange mottles; with some sandstone gravel				F		Rubber, bricks, sandstone cobbles, and timber @ 2-3m
				TP18_2.5			Plastic @ 2,7m
		3					
	End of Test Pit @ 3.5m						Natural soil not encountered

# ENVIRONMENTAL TEST PIT LOG TP19

PROJECT No. Dunheved Circuit, St Marys	EQUIPMENTS & METHODS Test Pitting with Excavator	X COORDINATE Refer to site layout plan
SITE 65-87 Dunheved Circuit, St Marys, NSW		Y COORDINATE Refer to site layout plan
		ELEVATION 37.4
CLIENT Borg Manufacturing	DATE COMPLETED 25/03/17	
		LOGGED BY RP

**LOCATION DESCRIPTION**

Graphic Log	Material Description	Depth (m)	PID	Samples	Consistency	Moisture	Additional Observations
	Gravel				L	D	
	FILL: clayey SAND; brown; with sand and gravels		0.7	TP19_0.2			
	FILL: silty CLAY; medium plasticity; brown with orange mottles; with some sand				F		Concrete and pieces of brick @ 0.5m
	Increasing clay content with depth and becoming darker brown	1					Vitrified clay pipe pieces
	dark brown to black	3			ST		
	End of Test Pit @ 3.6m		1.2	TP19_3.5		M	Hole full of water within 1 minute. Water has slight diesel odour. No evidence of service 'hit'. Last two scoops moist.

## APPENDIX H – EQUIPMENT CALIBRATION SHEETS

**PID Calibration Certificate**



Instrument      PhoCheck Tiger  
 Serial No.      T-105422

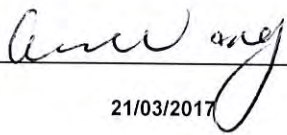
Air-Met Scientific Pty Ltd  
 1300 137 067

Item	Test	Pass	Comments			
Battery	Charge Condition	✓				
	Fuses	✓				
	Capacity	✓				
	Recharge OK?	✓				
Switch/keypad	Operation	✓				
	Display	✓				
Display	Intensity	✓				
	Operation (segments)	✓				
Grill Filter	Condition	✓				
	Seal	✓				
Pump	Operation	✓				
	Filter	✓				
	Flow	✓				
	Valves, Diaphragm	✓				
PCB	Condition	✓				
Connectors	Condition	✓				
Sensor	PID	✓	10.6 ev			
Alarms	Beeper	✓	Low	High	TWA	STEL
	Settings	✓	50ppm	100ppm	N/A	N/A
Software	Version	✓				
Data logger	Operation	✓				
Download	Operation	✓				
Other tests:						

**Certificate of Calibration**

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No		Instrument Reading
PID Lamp		98ppm Isobutylene	NATA	SY137		98.3ppm

Calibrated by:  Lin Wang

Calibration date: 21/03/2017

Next calibration due: 20/04/2017

## APPENDIX I – EPA CORRESPONDANCE 13 FEBRUARY 2018



DOC18/82693-01

Norton Rose Fulbright Australia  
GPO Box 3872  
SYDNEY NSW 2001

**EMAIL**

**13 February 2018**

Attention: Mr Richard Cohen

**65 Dunheved Cct, St Marys NSW 2760**

Thank you for your letter dated 8 February 2018 regarding Clean-up Notice No.1540293 issued to Maganic Brothers and Sister Pty Limited for clean-up of 65 Dunheved Cct, St Marys 2760 ("the Premises").

The EPA responds to your questions as follows:

1. The purchaser of the property should conduct their own investigations to satisfy themselves that all waste has been removed from the Premises.
2. The EPA does not intend to pursue any further regulatory action in relation to Clean-up Notice No.1540293 at this stage.
3. See comment 2 above.

If you have any questions regarding this matter, please contact Melissa Ward on 9995 5747.

Yours sincerely

A handwritten signature in black ink that reads "Spitts." with a period at the end.

DEANNE PITTS  
**A/Unit Head Waste Compliance**  
**Environment Protection Authority**

Contact officer: MELISSA WARD  
(02) 9995 5747