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# VALIDATION REPORT MUNICIPAL LANDFILL

## VALIDATION REPORT MUNICIPAL LANDFILL, HYDRO BUFFER LAND

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Description **Ramboll has supervised remediation and validation works associated with a Municipal Landfill located within the Buffer Zone of the Hydro Aluminium Kurri Kurri Smelter, Loxford, NSW. An outline of the remedial works and validation results are presented in this Validation Report.**

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## ABBREVIATIONS

Abbreviation	Description
ACM	Asbestos Containing Materials
AEC	Area of Environmental Concern
AHD	Australian Height Datum
ALS	Australian Laboratory Services
ASET	Australian Safer Environment and Technology Pty Ltd. (Laboratory)
ANZECC	Australian and New Zealand Environment and Conservation Council
B(a)P	Benzo(a)pyrene
BGS	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene & Xylenes (Monocyclic aromatic Hydrocarbons)
CN	Cyanide (total or free)
CT	Certificate of Title
DP	Deposited Plan
DQO	Data Quality Objective
EIL	Ecological Investigation Level
EPA	Environment Protection Authority
ESA	Environmental Site Assessment
Ha	Hectare
km	Kilometres
LOR	Limit of Reporting
m	Metres
MAH	Monocyclic Aromatic Hydrocarbons
Mercury	Inorganic mercury unless noted otherwise
Metals	As: Arsenic, Cd: Cadmium, Cr: Chromium, Cu: Copper, Fe: Iron, Ni: Nickel, Pb: Lead, Zn: Zinc, Hg: Mercury
mg/kg	Milligrams per Kilogram
mg/L	Milligrams per Litre
m BGL	Metres below ground level
mg/L	Micrograms per Litre
MW	Monitoring well
NATA	National Association of Testing Authorities
NC	Not Calculated
ND	Not Detected
NEHF	National Environmental Health Forum
NEPM	National Environment Protection Measure
NHMRC	National Health and Medical Research Council
OCPs	Organochlorine Pesticides
OH&S	Occupational Health & Safety
OPPs	Organophosphorus Pesticides
PAEC	Potential Area of Environmental Concern
PAHs	Polycyclic Aromatic Hydrocarbons

Abbreviation	Description
PCBs	Polychlorinated Biphenyls
PQL	Practical Quantitation Limit
pH	a measure of acidity, hydrogen ion activity
QA/QC	Quality Assurance/Quality Control
RPD	Relative Percent Difference
SILs	Soil Investigation Levels
SVOCs	Semi Volatile Organic Compounds
TPHs	Total Petroleum Hydrocarbons
UCL	Upper Confidence Limit
VENM	Virgin Excavated Natural Material
VOCs	Volatile Organic Compounds
µg/L	Micrograms per Litre
-	On tables is "not calculated", "no criteria" or "not applicable"

## EXECUTIVE SUMMARY

Ramboll Australia Pty Ltd was engaged by Hydro Aluminium Kurri Kurri Pty to validate the remediation of the Municipal Landfill located within the Hydro Buffer Land.

A Phase 2 Environmental Site Assessment completed at the Municipal Landfill in April 2014 confirmed the presence of buried municipal waste materials and impacts to soil in the form of asbestos, lead and polycyclic aromatic hydrocarbons. Minor impacts to the soil matrix from concentrations of soluble fluoride, petroleum hydrocarbons, copper, nickel and zinc exceeding the ecological criteria were also identified.

The presence of municipal waste materials and impacted soil was considered to pose an unacceptable risk to human health and the environment in the context of the current land use and the proposed commercial/ industrial use and represents an impact on visual amenity. A remediation program was detailed in a Remedial Action Plan, which identified that the preferred remedial strategy was excavation of the waste and impacted materials and relocation to the engineered containment cell proposed to be constructed on the Smelter site.

Remedial works for the Municipal Landfill were undertaken by CMA Contracting (CMA) between February 2019 and March 2019 and involved the following:

- Establishment of a designated stockpile area on Dickson Road within the Smelter Site
- Bulk excavation of wastes and impacted soils from the Municipal Landfill
- Safe work measures for asbestos work, including water sprays over the open face of the excavation, use of a hose to wet down the material during transfer from the excavation to the trucks, use of a water cart when required, asbestos air monitoring on a daily basis and PPE requirements for the contaminated zone
- Transportation of wastes to the designated stockpile area
- Materials tracking over smelter weighbridge to record mass of material removed
- Hen picking of ACM fragments from the excavation by Aztech
- Completion of asbestos clearance certificates by Hazmat
- Collection and analysis of validation samples by Ramboll
- Survey of the final excavation footprint
- Backfilling of the excavation with certified ENM material stockpiled at the Smelter Site.

Validation of the removal of wastes and contaminated soil from the Municipal Landfill was achieved via multiple lines of evidence, including:

- Visual observation of the removal of wastes and contaminated soils
- Asbestos air monitoring during remedial works
- Hen picking of ACM fragments from the excavation surface
- Provision of an Asbestos Clearance Certificate at the completion of the works
- Analysis of validation soil samples for contaminants of concern identified during the Phase 2 ESA: PAHs, asbestos, soluble fluoride, TRH, BTEX, copper, lead, nickel and zinc
- Comparison of validation soil results to validation criteria for the most sensitive future landuse of Environmental Conservation (E2)

Validation of the removal of wastes and contaminated soil from the Municipal Landfill was achieved via multiple lines of evidence, including:

- Visual observation of the removal of wastes
- Asbestos air monitoring during remedial works
- Hen picking of ACM fragments from the excavation surface
- Provision of Asbestos Clearance Certificates at the completion of the works
- On-site sieving of validation samples to validate the removal of bonded ACM fragments

- Analysis of validation soil samples for contaminants of concern identified during the Phase 2 ESA: PAHs, asbestos, soluble fluoride, TRH, BTEX, copper, lead, nickel and zinc
- Comparison of validation soil results to validation criteria for the most sensitive future land use of Environmental Conservation (E2)

Based on observations made of the final remedial excavation at Municipal Landfill and the validation analytical results, it is considered that the site is suitable for the proposed Business Park (B7) and Environmental Conservation (E2) land use.

Remediation via source removal will also result in improvements to groundwater quality within the former landfill site, where elevated zinc and nitrate concentrations were identified within a localised, discontinuous shallow aquifer during the Phase 2 ESA investigations. No ongoing long term management of groundwater is required.



# 1. INTRODUCTION

Ramboll Australia Pty Ltd was engaged by Hydro Aluminium Kurri Kurri Pty Ltd to validate the remediation of the Municipal Landfill located within the Hydro Buffer Land. The Municipal Landfill was located within the Buffer Zone of the Hydro Aluminium Kurri Kurri Smelter, Loxford, NSW 2326.

## 1.1 Background

Hydro Aluminium Kurri Kurri Pty Ltd (Hydro) owns the Hydro Aluminium Kurri Kurri Aluminium Smelter (the Smelter) located at Hart Road Loxford NSW 2326. The Smelter comprises approximately 80 hectares of land and is surrounded by approximately 1,940 hectares of buffer zone land that is owned and managed by Hydro (together the Hydro Land).

The Smelter commenced operations in 1969, however, smelting activities ceased in September 2012. In May 2014 Hydro formally announced the closure of the Smelter. Since this time Hydro has evaluated the future use of the Smelter and the Hydro Land including investigations of contamination within the Hydro Buffer Land. Investigations identified the presence of a landfill believed to have been used historically for municipal purpose (the Municipal Landfill).

The Municipal Landfill is located within land located in the southern portion of the Buffer Zone referred to as Parcel 9. The Rezoning Masterplan identified proposed General Industrial (IN1) and Environmental Conservation (E2) land use for Parcel 9.

A Phase 1 Environmental Site Assessment (Environ 2013), (previously prepared for all Hydro owned lands), evaluated the potential for contamination of the Smelter Site and surrounding Buffer Zone and identified the presence of buried municipal waste materials in an area to the east of Hart Road.

A Phase 2 Environmental Site Assessment (Environ 2014b) was conducted at the Municipal Landfill which included a site inspection, excavation of test pits, installation of groundwater monitoring wells, soil sampling and analysis, surface water and groundwater sampling and analysis. The assessment confirmed the presence of buried municipal waste materials. An evaluation of soil identified impacts in the form of asbestos, lead and polycyclic aromatic hydrocarbons (PAHs). Minor impacts to the soil matrix from concentrations of soluble fluoride, petroleum hydrocarbons, copper, nickel and zinc exceeding the ecological criteria were also identified.

The presence of municipal waste and contaminated soils was considered to pose an unacceptable risk to human health and the environment in the context of the current land use and the proposed commercial/ industrial use and represents an impact on visual amenity.

A remediation program, detailed in a Remedial Action Plan (Ramboll 2018) prepared for the site considered a range of appropriate remedial options. The RAP identified that the preferred remedial strategy was excavation of the waste and impacted materials and relocation to the engineered containment cell proposed to be constructed on the Smelter site. The engineered containment cell, comprising a double cap and liner system, is currently subject to State Significant Planning Approval (SSD 6666), and will conjointly house other wastes and contaminated soils originating from the Hydro land.

Remedial works at the Municipal Landfill were completed in 2019 and are the subject of this Validation Report.

## 1.2 Objective

The objective of the works was to remediate the Municipal Landfill to a level suitable for the proposed General Industrial (IN1) and Environmental Conservation (E2) land use. This Validation Report forms part of those works and provides a description of the impacted area requiring

remediation, the methodology to remediate this area and validation of this area in order to meet the project objective.

### 1.3 Scope of Work

To meet the objective, Ramboll has completed the following scope of work:

- Review previous reports prepared for the Hydro Land including:
  - Environ Australia Pty Ltd (2013) Phase 1 Environmental Site Assessment, Hydro Kurri Kurri Aluminium Smelter
  - Environ Australia Pty Ltd (2014a) Phase 2 Environmental Site Assessment, Parcel 9.
  - Environ Australia Pty Ltd (2014b) Phase 2 Environmental Site Assessment, Kurri Kurri Municipal Landfill, Hart Road, Loxford
  - Ramboll Australia Pty Ltd (November 2018) Remedial Action Plan, Lots 435, 436 and 437 DP755231, Kurri Kurri, NSW.
- Consultation with regulatory guidelines
- Supervise contractors who conducted the site remediation works in accordance with the RAP
- Undertaken validation sampling
- Review documentation provided by the contractors
- Prepare this Validation Report.

## 2. SITE IDENTIFICATION

### 2.1 Site Location

The Hydro Land is located approximately 30 km west of the town of Newcastle and 150 km north of Sydney in New South Wales, Australia. Parcel 9 is located in the southern portion of the Hydro Land. The Municipal Landfill ('the site') is located in the south western portion of Parcel 9.

Site identification and location details are presented in **Table 2.1**. The location of the Municipal Landfill within the Hydro Land is shown on **Figure 1, Appendix 1**.

**Table 2.1 Site Identification**

Item	Description
Site Owner	Hydro Aluminium Kurri Kurri Pty Limited (subject to Deed of Company Arrangement)
Street Address	Hart Road, Loxford, New South Wales, Australia, 2326
Local Government Area	Cessnock City Council
Parish and County	Heddon, Northumberland
Distance from Nearest CBD	Approximately 3.5 km north-west of Kurri Kurri, and 30 km north-west of Newcastle
Geographical Coordinates	Latitude 32°48'06" S, Longitude 151°28'15" E
Lot and DP Numbers	Lots 435, 436 and 437 in DP 755231
Site Area	11.8 ha.
Zoning (current)	RU2 – Rural Landscape
Zoning (future)	Business Park (B7) and Environmental Conservation (E2)
Site Elevation	Approximately 13m AHD to 21 m AHD
Site Map	<b>Figure 1, Appendix 1</b>

### 2.2 Site Boundaries

The site is located within the following boundaries:

- East: Swamp Creek then undeveloped bushland within the Buffer Zone owned by Hydro
- North: Undeveloped bushland and rural residential properties within the Buffer Zone owned by Hydro
- West: Hart Road then undeveloped bushland within the Buffer Zone owned by Hydro
- South: Rural residential properties

### 2.3 Proposed Landuse

The Hydro Land is proposed to be redeveloped to allow a range of new development. A draft land use strategy is shown in **Figure 2, Appendix 1** and it is expected that the future uses of the site would include Business Park (B7) and Environmental Conservation (E2) land.

### 3. SITE BACKGROUND

Site history investigations included in the Phase 1 ESA for the Hydro Land (Environ 2013) indicated that Lots 435, 436 and 437 form part of the Buffer Zone and therefore may be subject to dust deposition from the smelter operations. In addition, Lot 436 and Lot 437 had indications of ground disturbance (often indicative of filled land).

Further discussion with Hydro site personnel and long-term residents of the local area indicated that the site was the location of the former Kurri Kurri Municipal Landfill which was closed in the 1960s. The landfill had been operating since at least the 1940s, as bottles from this time were previously excavated from the landfill. Anecdotal information indicates that the landfill operations included a gate keeper and restricted access and that during operation of the landfill, waste was burned on-site prior to being buried.

A preliminary reconnaissance investigation was conducted in November 2013 (Environ 2014a), comprising excavation of several test holes using a backhoe across the suspected former landfill area. This limited investigation identified a fill layer up to a depth of approximately 1.5 m below surface, comprising domestic waste including glass (broken bottles), plastic, ash and steel. Fragments of potential asbestos containing material (ACM) were also identified.

The site is within the local government area of Cessnock City Council under whose auspices the landfill would have operated. At the time of reporting in 2013, enquiries to the Council concerning potential site records had been made by Hydro and Council has not located records relating to the site. Hydro provided the sale transfer documents which show the site was purchase by Hydro from the Council of the City of Cessnock on the 29 January 1990.

A Phase 2 Environmental Site Assessment was completed in April 2014 (Environ 2014b) with the aim of fully defining the physical extent of the former landfill (area and depth), characterising the landfill in terms of contaminants present, assessing the impacts on the wider environment and identifying what remediation would be required to render the site suitable for the proposed future land use. The former landfill was characterised by uneven hummocky ground with localised subsidence and scattered partially buried glass, steel and minor wood/ timber wastes. A total of 15 test pits and hand auger holes were excavated within the former landfill and soil samples were collected for laboratory analysis. Five boreholes were drilled within the former landfill to investigate impacts to groundwater. Groundwater was encountered in two of the five boreholes and groundwater wells were installed at these locations. Further information pertaining to the soil and groundwater results and extent of contamination is included in **Section 4.6**.

## 4. SITE CHARACTERISATION

### 4.1 Topography

The north western third of Lots 435, 436 and 437 (which includes the Municipal Landfill) is generally flat and at a higher elevation (approximately 20 m AHD) than the remainder of the site. There is a significant slope towards the south east of the site and in the south east, the site slopes towards Swamp Creek, which is located on the eastern site boundary. Swamp Creek is at an elevation of approximately 13 m AHD.

The area comprising the Municipal Landfill within the site appears to be a linear in-filled former channel, possibly deepened during its operation.

### 4.2 Regional Geology

According to the review of the regional geology described on the Hunter Coal Field Geological 1:100 000 Sheet, most of the Hydro Land is underlain by the Lower Permian-aged Rutherford Formation comprising, sandstone and siltstone. The south eastern low-lying areas are underlain by Quaternary-aged undifferentiated alluvium (clays, sands and silts), associated with the modern surface water bodies.

The site is likely underlain by a weathered profile of Rutherford Formation sandstones/siltstones with a veneer of Quaternary Alluvial sands associated with Swamp Creek.

### 4.3 Regional Hydrogeology

Regional groundwater is expected to follow regional topography and flow north east towards the surface water bodies that discharge to the Hunter River.

Locally, groundwater beneath the site is expected to flow to the south east down-slope towards Swamp Creek on the south east site boundary.

According to the NSW Office of Environment and Heritage (Natural Resource Atlas), there are 17 licensed groundwater abstractions (bores) located within 2 km of the site. The majority of the groundwater bores are located within the Hydro Land.

Wells were installed at the Smelter during environmental investigations in 2012 and 2014 and are located approximately one to two kilometres to the north of the site. These wells generally encountered water between two and five metres depth in residual clays and weathered siltstones.

The Hunter River Alluvium Groundwater Management Unit (GMU) is an important groundwater resource to the region. Groundwater extraction for irrigation, urban supply, drought supply, stock, domestic and commercial/ industrial use occurs, with volumes in excess of 10,000ML per annum extracted from the Hunter River Alluvium GMU. Aquifer storage and recovery is also an important use of this GMU. It is noted that the Hunter River GMU is not the primary drinking water supply in the region, although the protection of drinking water is a water quality objective for the Hunter River (NSW Water Quality and River Flow Objectives) ([www.environment.nsw.gov.au/ieo/Hunter/index.htm](http://www.environment.nsw.gov.au/ieo/Hunter/index.htm)).

### 4.4 Site Hydrology

Surface water from the site is likely to discharge via ephemeral drainage lines to the south east following topography.

Swamp Creek flows across the south-eastern boundary of the Lots 435 and 436, flowing toward the north east. A number of small ephemeral water channels also cross the site directing surface water to the north east and east.

#### 4.5 Site Sensitivity

The site's sensitivity with respect to surface water and groundwater is considered to be moderate based on the following:

- Surface water and groundwater discharge into Swamp Creek, which is located 3.5 km from Wentworth Swamp and 15 km from the Hunter River within the Fishery Creek Catchment;
- Declining stream water quality and a reduction in diversity of native plants and animals has occurred within the Fishery Creek Catchment and water quality down gradient of the site has been impacted by historical coal mining (Hunter-Central Rivers Catchment Management Authority);
- The Hunter River GMU is used for irrigation, urban supply, drought supply, stock, domestic and commercial/ industrial use but it is not the main drinking water supply in the region.

#### 4.6 Assessment of Contamination

A Phase 2 Environmental Site Assessment (ESA) was completed at the Municipal Landfill in April 2014 (Environ 2014b). A Phase 2 ESA of Parcel 9, the land parcel in which the landfill is located, was also completed in April 2014 (Environ 2014a). Observations made during these assessments are included below:

- Lots 435, 436 and 437 are predominantly covered in dense bush/ vegetation with some more open grass/ shrub covered areas (including the former landfill area) close to Hart Road on the western boundary.
- The Municipal Landfill is typically characterised by uneven hummocky ground and waste is clearly visible on the surface.
- The site is fenced along the western, southern, northern and eastern boundaries. The fence is post and wire and there is no impact to soil stability on the site boundary.
- Visible signs of plant stress and odours were not recorded on the field sheets.

Fill comprising domestic wastes including glass (typically broken bottles), plastic, paper, timber, metal, brick and concrete was encountered under a thin sand layer (typically less than 0.15 m) to a maximum depth of 1.5 m below ground surface (bgs). Layers and pockets of ash were encountered in several pits, typically characterised by a gritty, coarse sandy texture. Numerous fragments of ACM material was found within the fill profile and on the surface of the former landfill. The fill was underlain by alluvial sediments comprising light brown and grey sands. No water was encountered within the test pits to the maximum depth of the investigation (1.6 m bgs).

The surface of some areas of the former landfill was observed to be deeply rutted, with areas of subsidence where voids within the fill had collapsed (e.g. where large containers like steel drums had been buried). In several locations, large metals wastes (typically old car bodies) were lying on the surface or partially buried. Animal activity (rabbit or wombat burrows) had resulted in the movement of buried wastes to the surface. Based on the site history and close proximity to the smelter, contaminants of concern were considered to be asbestos, heavy metals, polycyclic aromatic hydrocarbons (PAHs), soluble fluoride and petroleum hydrocarbons. Based on the age of the landfill being between 1940s and 1960s, per-fluoroalkyl substances (PFAS) were not considered a contaminant of concern.

A summary of the soil results at the Municipal Landfill is presented in **Table 4.1**. Results indicate that fill soils within the landfill were contaminated with elevated concentrations of PAHs, lead and asbestos. Concentrations of copper, nickel, zinc, soluble fluoride and benzo(a)pyrene exceeded the ecological criteria.

**Table 4.1 Summary of Soil Results, Phase 2 ESA (2014b)**

Analyte	No. of Samples	Maximum Concentration (mg/kg)	No. exceeding Site Criteria	Criteria Exceeded (mg/kg)
Soluble Fluoride	13	220	<b>13</b>	4.3 (EIL)
Total Cyanide	13	<0.5	0	-
BaP	13	17.1	<b>2</b>	0.7 (ESL)
BaP TEQ	13	24.4	<b>2</b>	3 (HIL)
Total PAHs	13	173	0	-
TRH C6-C10 less BTEX (F1)	13	<25	0	-
TRH >C10-C16 less naphthalene (F2)	13	<50	0	-
TRH >C16-C34	13	1800	0	-
TRH >C34-C40	13	420	0	-
Arsenic	13	6	0	-
Cadmium	13	4	0	-
Chromium	13	32	0	-
Copper	13	75	<b>5</b>	45 (EIL)
Lead	13	779	<b>2</b>	600 (HIL)
Nickel	13	29	<b>8</b>	9 (EIL)
Zinc	13	1330	<b>11</b>	120 (EIL)
Mercury	13	1.2	0	-
Dieldrin*	13	0.37	0	-
Asbestos (quantification)	13	0.186%	<b>5</b>	FA and AF <7 mm (Asbestos HSL)

\* All other pesticides were below detection limits

FA: Friable Asbestos; AF: Asbestos Fines

Two wells, MW1 and MW2, were installed during the Phase 2 ESA. MW1 is located upgradient of the Municipal Landfill and MW2 is located within the former landfill. Groundwater was encountered at a depth of 5 m bgs within alluvial sands in these wells. Three other boreholes were drilled to a maximum depth of 14 m bgs and groundwater was not encountered. Groundwater intersected at wells MW1 and MW2 is considered to represent a discontinuous perched aquifer within shallow alluvial sediments overlying less permeable weathered siltstone. This aquifer is considered to be of limited areal extent and unlikely to be connected to Swamp Creek, the closest surface water receptor located on the eastern site boundary. Groundwater samples were collected from MW1 and MW2 and concentrations of most contaminants of concern were below the relevant guidelines for irrigation, stock watering and 95% protection of fresh water species. Concentrations of zinc were identified above the ecological protection criteria in both wells and concentrations of nitrate in the well within the landfill were above ecological protection criteria.

#### 4.7 Conceptual Site Model

A conceptual site model (CSM) is a representation of the source, pathway and receptor linkages at a site. The CSM for the Municipal Landfill is provided in **Table 4.2**.



**Table 4.2 Conceptual Site Model**

Pathway	Potentially Complete Source-Pathway-Receptor Linkage? (Yes/No/Potential/Not Applicable)					Justification
	Current and future onsite employees (non-intrusive)	Current and future onsite intrusive construction and maintenance workers	Current and future recreational users	Hydro Lands ecological receptors	Ecological receptors of Swamp Creek	
<b>Fill Material with Municipal Waste</b>						
Dermal contact with soil and dust	Y	Y	Y	Y	N	Asbestos as bonded ACM sheeting fragments and small, degraded ACM fragments (asbestos fines/ fibrous asbestos) was detected in fill soils. Inhalation is the only pathway for asbestos to impact humans. Dermal contact and incidental ingestion are not pathways for asbestos.
Incidental ingestion of dust/ soil	Y	Y	Y	Y	N	
Dermal contact with dust only	Y	Y	Y	Y	NA	
Outdoor dust inhalation	Y	Y	Y	Y	NA	
Indoor dust inhalation	Y	Y	NA	NA	NA	Elevated lead and benzo(a)pyrene concentrations were detected in fill soils exceeding the health investigation levels. Current and future site users may come into contact with these contaminants in soil.  Elevated soluble fluoride, copper, nickel, lead and zinc concentrations were detected in fill soils exceeding the site-specific ecological investigation level. Fauna may come into contact with fluoride and zinc in soil through direct contact and ingestion. Perched groundwater at the site is unlikely to be connected to Swamp Creek, so there is no pathway for ecological receptors of Swamp Creek.
<b>Groundwater</b>						
Dermal contact	Y	Y	N	N	N	Localised perched groundwater was identified within the landfill site, which is unlikely to be connected to Swamp Creek.
Incidental ingestion	Y	Y	N	N	N	

#### **4.8 Statement of Suitability for Existing and Proposed Site Use**

The proposed future development of the site for Business Park (B7) and Environmental Conservation (E2) land use will alter the exposure scenarios.

It is considered that the change in exposure/receptor conditions will pose a potential risk to human health in relation to asbestos and elevated lead and benzo(a)pyrene concentrations and the environment in relation to elevated copper, nickel, zinc, soluble fluoride and benzo(a)pyrene concentrations in fill, and visual amenity is compromised due to the presence of buried waste. Remediation of the buried waste is required.

## 5. REMEDIAL ACTION PLAN

Ramboll prepared a Remedial Action Plan (RAP) prior to undertaking the remediation:

- 'Remedial Action Plan, Lots 435, 436 and 437 DP755231, Kurri Kurri, NSW, dated November 2018

A summary of the RAP is provided below.

### 5.1 Summary of RAP

#### 5.1.1 Remediation Goal

The goal of this remediation project is to render the site suitable for business Park (B7) and environmental conservation (E2) landuse.

#### 5.1.2 Extent of Remediation Required

Sub-surface contamination including buried wastes in a soil matrix requires remediation across the area identified as the Municipal Landfill as shown in **Figure 3, Appendix 1**. Two fill mounds with asphalt near the western boundary fenceline of Lot 436 and old tyres near the southern boundary fenceline of Lot 436 also require removal as shown in **Figure 3, Appendix 1**.

The contaminant profile identified comprises a gully that has been progressively filled with municipal wastes and then covered with a thin sand layer.

The approximate fill volume estimates are presented in **Table 5.1**. Volume calculations were determined from an estimation of the lateral and vertical extent determined during site investigations. Tonnages were calculated from the anticipated bulk density as shown for each material present. There is inherent uncertainty in the volume estimates.

**Table 5.1 Fill Quantity Estimates**

Type	Volume estimates (m <sup>3</sup> )			Bulk Density (T/m <sup>3</sup> )	Mass estimates (T)	
	Range				Range	
	Estimate	Low	High		Low	High
Municipal wastes	5600	2800	8400	1.6	4480	13,440

Minimal migration of contaminants vertically through the soil profile is anticipated however validation of the natural materials within the exposed excavations will be required.

#### 5.1.3 Remediation Options and Selected Option

The following remedial options were evaluated for the Municipal Landfill:

- Do nothing
- Excavate, sort and dispose to waste facility
- Encapsulation of wastes at another location within Hydro owned land
- Encapsulate and manage in-situ

Remediation options were considered in terms of cost, risk of failure, long term legacy and onsite management, corporate responsibility and sustainability. In terms of these evaluators Option 3 was preferred.

Hydro has conducted a whole-of-site remediation options study in 2014 to identify the most appropriate remediation strategy applicable to the issues across all Hydro Land. Option 3 allows municipal wastes from the Municipal Landfill to be incorporated with other smelter derived wastes that require remediation on another part of the Smelter Site. This option will also remove the source of asbestos and impacts to visual amenity.

## 6. REMEDIAL WORKS

Remedial works were undertaken by CMA Contracting (CMA) between February 2019 and March 2019. CMA subcontracted Aztech as the asbestos supervisor and to complete asbestos removal works. Hazmat were subcontracted to provide asbestos air monitoring and asbestos clearance reports. Remedial activities involved the following:

- Preparation of the site for remedial works – importation of road base and construction of a road, set up of site sheds, water tank, asbestos decontamination unit
- Felling and mulching of trees located within the footprint of the Municipal Landfill and a buffer area for a truck route
- Set up of environmental controls including sediment fencing and berms downgradient of the Municipal Landfill
- Demarcation of a contaminated zone at the location of the Municipal Landfill and a non-contaminated zone outside the excavation area
- Bulk excavation of wastes from the Municipal Landfill
- Loading wastes directly into B double road trucks
- Safe work measures for asbestos work, including water sprays over the open face of the excavation, use of a hose to wet down the material during transfer from the excavation to the trucks, use of a water cart when required, asbestos air monitoring on a daily basis and PPE requirements for the contaminated zone
- Transportation of wastes to the designated stockpile area located on Dickson Road within the Smelter
- Materials tracking over the smelter weighbridge to record mass of material removed
- Hen picking of ACM fragments from the excavation by Aztech
- Completion of asbestos clearance certificates by Hazmat
- Collection of validation samples by Ramboll, laboratory analysis by ALS and Eurofins|MGT
- Survey of the final excavation footprint by Veris
- Backfilling of the excavation with Excavated Natural Material (EMN) stockpiled at the Smelter Site
- Placement of felled trees over the backfilled area to complete the final landform.

## 7. VALIDATION SAMPLING, ANALYSIS AND QUALITY PLAN

The following is the validation sampling, analysis and quality plan (SAQP) that was implemented to validate the remedial objective has been achieved at the Municipal Landfill. The SAQP was presented in the RAP (Ramboll 2018).

### 7.1 Validation Sampling and Analysis

Validation sampling of soil will be required to demonstrate that, following excavation of all fill materials, remaining soils are within the adopted guidelines for the site.

Validation involved:

- Visual assessment and documentation (photographic) of remaining soils for absence of waste materials and fill soils;
- Completion of validation sampling from the base of the remedial excavation for analysis for TRH, PAHs, heavy metals, fluoride and asbestos.
- Completion of Asbestos Clearance Certificate for the area of the Municipal Landfill.

### 7.2 Validation Data Quality Objectives

In order to achieve the objectives and purpose of the validation program, both the field and laboratory programs must be representative of the actual extent of contamination in soil. As such, specific Data Quality Objectives (DQOs) have been developed for the validation of field and analytical data obtained during the remediation. The DQO process is a systemic, seven step process that defines the criteria that the validation sampling should satisfy in accordance with the requirements of EPA (2017) *Guidelines for the NSW Site Auditor Scheme* (3<sup>rd</sup> Edition). The DQOs are as follows:

#### 7.2.1 Step 1: State the Problem

Prior to remediation, the Municipal Landfill was not considered suitable for the proposed Business Park (B7) landuse and remediation is required. Remediation of the following site contaminants is required:

- Buried municipal wastes, which represent an impact to visual amenity;
- Soil contamination: ACM fragments were identified within the waste materials at concentrations exceeding the human health criteria. Benzo(a)pyrene and lead were identified at concentrations exceeding the health investigation levels. Soluble fluoride, copper, nickel and zinc were identified at concentrations exceeding the ecological investigation level. Petroleum hydrocarbons were detected at concentrations exceeding the ecological screening level.

#### 7.2.2 Step 2: Identify the Decisions

The validation SAQP is to ensure that remediation has been carried out successfully. To validate the effectiveness of the remediation strategy, the following is required:

- Visual assessment and documentation (photographic) of remaining soils for absence of waste materials and fill soils;
- Completion of validation sampling from the base of the remedial excavation for analysis for TRH, soluble fluoride, lead, zinc, PAHs and asbestos.
- Completion of Asbestos Clearance Certificate for the area of the Municipal Landfill.

The site will be considered remediated when the remediation and validation program has been carried out successfully. Remediation is deemed to be successful when:

- Waste materials and ACM fragments have been excavated from the Municipal Landfill and appropriately relocated
- Excavations have been reinstated with suitable material to an accepted landform

- Sampling shows concentrations of contaminants of concern are below the Assessment Criteria in **Section 9**.

#### 7.2.3 Identify Inputs to the Decision

For the Municipal Landfill, the following inputs into the decision-making process are required:

- A visual evaluation of the removal of all buried waste materials
- Provision of an Asbestos Clearance Certificate
- Validation sampling laboratory results for asbestos, soluble fluoride, lead, zinc, PAHs and TRH
- Documented materials tracking that demonstrates all materials have been appropriately relocated
- Final survey that demonstrates the landform has been reinstated to achieve the objectives of the final landform

#### 7.2.4 Step 4: Define the Study Boundary

The site boundaries have been outlined and defined within this RAP and are presented in **Figure 3**. Remediation applies to buried wastes and associated fill soils impacted with ACM, soluble fluoride, lead, zinc, PAHs and petroleum hydrocarbons and identified as the Municipal Landfill.

The temporal study boundary is the duration of the remediation and validation works.

#### 7.2.5 Step 5: Development of Decision Rules

Decision rules for the validation of the remedial works are based around visual and chemical validation of the removal of stockpiled and buried materials, including glass, metal, brick, ceramic, ACM fragments, 44 gallon drums and buried cars. The decision rules are as follows:

- Can it be visually confirmed that buried waste materials have been removed from the Municipal Landfill?
- Visual validation shows that the walls and base of the excavation are within yellow to white coarse grained alluvial sands?
- Are laboratory results for validation samples below the Assessment Criteria?

The types of data quality required, appropriate field methods (including sampling procedure and preservation of samples) and the quality of analytical data undertaken by the commercial laboratories are summarised in the following.

- All sample analyses are to be conducted using National Association of Testing Authorities (NATA) registered methods in accordance with ANZECC (1996) and NEPC (2013) guidelines.
- All samples are to be extracted within the laboratory specified acceptable sample holding time.
- Samples are to be appropriately preserved and handled in accordance with the sampling methodology outlined in Step 7.
- PQLs are to be less than the adopted assessment criteria.
- Duplicates, spikes, blanks, and control samples are to meet the DQIs presented in Step 6.

#### 7.2.6 Step 6: Specific Limits of Decision Error

Acceptable limits and the manner of addressing possible decision errors are outlined in the sections below:

- The decision to be made is that all buried waste materials have been excavated from the Municipal Landfill and that the resultant excavation is within alluvial yellow/ white sand.
- Possible decision errors include deciding that all buried waste materials have been removed when they have not or deciding that the resultant excavation is within alluvial yellow/ white sand when it is not.

Acceptable limits and the manner of addressing possible decision errors are outlined in the sections below:

*Accuracy:* Accuracy is defined as the nearness of a result to the true value, where all random errors have been statistically removed. Internal accuracy is measured using percent recovery '%R' and external accuracy is measured using the Relative Percent Difference '%RPD'.

*Internal accuracy* will be tested utilising:

Surrogates	Surrogates are QC monitoring spikes, which are added to all field and QA/QC samples at the beginning of the sample extraction process in the laboratory, where applicable. Surrogates are closely related to the organic target analytes being measured, are to be spiked at similar concentrations, and are not normally found in the natural environment;
Laboratory control samples	An externally prepared and supplied reference material containing representative analytes under investigation. These will be undertaken at a frequency of one per analytical batch;
Matrix spikes	Field samples which are injected with a known concentration of contaminant and then tested to determine the potential for adsorption onto the matrix. These will be undertaken at a frequency of 5%.

Recovery data shall be categorised into one of the following control limits:

- 70%-130%R confirming acceptable data, note that there are some larger %R for intractable substances;
- 69%-20%R indicates discussion required. May be considered acceptable data, or may be regarded with uncertainty;
- 10-19 %R indicating that the data should be treated as an estimate result;
- <10 %R indicating that the data should be rejected.

*External accuracy* will be determined by the submission of inter-laboratory duplicates at a frequency of 5%. Data will be analysed in accordance with the following control limits:

- 60% RPD at concentration levels greater than ten times the PQL.
- 85% RPD at concentrations between five to ten times the PQL.
- 100% RPD at concentration levels between two and five times the PQL.

Where concentration levels are less than two times the PQL, the Absolute Difference (AD) shall be calculated. Data will be considered acceptable if the AD < 2.5 times the PQL.

Any data which does not conform to these acceptance criteria will be examined for determination of suitability for the purpose of site characterisation.

*Precision:* The degree to which data generated from replicate or repetitive measurements differ from one another due to random errors. Precision is measured using the standard deviation 'SD' or Relative Percent Difference '%RPD'.

*Internal precision* will be determined by the undertaking of laboratory duplicates, where two sub samples from a submitted sample are analysed. These will be undertaken at a frequency of 10%. A RPD analysis is calculated and results compared to:

- 50% RPD at concentration levels greater than ten times the PQL.
- 75% RPD at concentrations between five to ten times the PQL.

- 100% RPD at concentration levels between two and five times the PQL.

Where concentration levels are less than two times the PQL, the Absolute Difference (AD) shall be calculated. Data will be considered acceptable if the:  $AD < 2.5$  times the PQL.

Any data which does not conform to these acceptance criteria will be examined for determination of suitability for the purpose of site characterisation.

*External precision* will be determined by the submission of intra-laboratory duplicates at a frequency of 5%. The external duplicate samples are to be obtained by mixing and then splitting the primary sample to create two identical sub samples. Field duplicate samples are to be labelled with a unique identification that does not reveal the association between the primary and duplicate samples e.g. QA1.

It must be noted that significant variation in duplicate results is often observed (particularly for solid matrix samples) due to sample heterogeneity or concentrations reported near the Practical Quantification Limit (PQL).

Data will be analysed in accordance with the following control limits:

- 50% RPD at concentration levels greater than ten times the PQL.
- 75% RPD at concentrations between five to ten times the PQL.
- 100% RPD at concentration levels between two and five times the PQL.

Where concentration levels are less than two times the PQL, the Absolute Difference (AD) shall be calculated. Data will be considered acceptable if the:  $AD < 2.5$  times the PQL.

Any data which does not conform to these acceptance criteria will be examined for determination of suitability for the purpose of site characterisation.

Blank samples will be submitted with the analytical samples and analysed for the contaminants of concern: Field Blank One per matrix type each batch samples/each day.

The laboratory will additionally undertake a method blank with each analytical batch of samples. Laboratory method blank analyses are to be below the PQLs. Results shall be examined and any positive results shall be examined. Positive blank results may not be subtracted from sample results.

Positive results may be acceptable if sample analyte concentrations are significantly greater than the amount reported in the blank (ten times for laboratory reagents such as methylene chloride, chloroform, and acetone etc., and five times for all other analytes). Alternatively, the laboratory PQL may be raised to accommodate blank anomalies provided that regulatory guidelines are not compromised by any adjustment made to the PQL.

*Completeness:* The completeness of the data set shall be judged as:

- The percentage of data retrieved from the field compared to the proposed scope of works. The acceptance criterion is 95%;
- The percentage of data regarded as acceptable based on the above data quality objectives. 95% of the retrieved data must be reliable.
- The reliability of data based on cumulative sub-standard performance of data quality objectives.

Where two or more data quality objectives indicate less reliability than what the acceptance criteria dictates, the data will be considered with uncertainty.



**Representativeness:** Sufficient samples must have been collected from the soil present at the Site. This will be calculated for soil samples by Procedure B, NSW EPA Sampling Design Guidelines, 1995.

Samples must be collected and preserved in accordance with the sampling methodology proposed in Step 7 to ensure that the sample is representative of the assessed stratum.

**Comparability:** The data must show little to no inconsistencies with results and field observations and include likely associates e.g. TPH C6-C10 and BTEX.

**Decision Error Protocol**

If the data received is not in accordance with the defined acceptable limits outlined in Steps 5 and 6, it may be considered to be an estimate or be rejected. Determination of whether this data may be used or if re-sampling is required will be based on the following considerations:

- Closeness of the result to the guideline concentrations.
- Specific contaminant of concern (e.g. response to carcinogens may be more conservative).
- The area of site and the potential lateral and vertical extent of questionable information.
- Whether the uncertainty can be effectively incorporated into site management controls.

**Rectifying Non-conformances**

If any of the validation procedures or criteria identified are not followed or met, this will constitute a non-conformance. The significance of the non-conformance will determine if rectification is required after discussion with the Site auditor. In order to address any non-conformances, the Contractor's Environmental Consultant must assess the significance of each non-conformance and put their conclusion and recommendation to the auditor for approval.

7.2.7 Step 7: Optimise the Design for Obtaining Data – Soil Validation

The excavation is to be photographed on a daily basis to show the removal of buried waste materials and ACM impacted soil. The photolog shall be used to demonstrate compliance with the remedial strategy.

The validation program is presented in **Table 7.1**.

**Table 7.1 Validation Sampling Program**

Validation Method	Validation Requirements	Chemical Analysis
Visual validation of the removal of buried wastes	Excavations are to be photographed and a photographic log maintained and included in the Validation Report.	None
Chemical validation of walls and base of excavation	Sampling and analysis to demonstrate the removal of waste materials. Sampling across the base of the excavation is to be undertaken on a 30 m grid spacing. For the walls of the excavation, one validation sample per soil type present within the face of the excavation per 10 lineal metres. This sampling density is considered sufficient to confirm the absence of a contaminant hot spot greater than 5 m in diameter. This sampling program is in accordance with NSW EPA (1995) <i>Sampling Design Guidelines</i> .	Soluble fluoride, Copper, Nickel, Lead, Zinc, PAHs, TRH

Validation Method	Validation Requirements	Chemical Analysis
Validation of the removal of asbestos	Validation soil samples will be collected from the base of the excavation on a 30 m grid spacing. A 10 L bulk sample is to be collected and sieved through a 7 mm sieve. ACM fragments retained on the sieve are to be weighed and a weight for weight concentration of bonded ACM calculated. An additional 500 mL sample is to be submitted to the laboratory for analysis for asbestos fines/ fibrous asbestos.	Asbestos
Asbestos Clearance Certificate	A suitably qualified asbestos assessor is to provide an Asbestos Clearance Certificate indicating that no visual ACM remains at the site.	None
Visual validation of the removal of wastes from other areas of the site	A photographic log is to be maintained of the removal of wastes from other areas of the site, including two fill mounds with asphalt near the western boundary fenceline of Lot 436 and old tyres near the southern boundary fenceline of Lot 436.	None

### 7.3 Validation Sampling Methods

The following sampling methodology should be implemented:

- Discrete sampling will be undertaken by collecting surface soil using a steel trowel or collection directly from the soil surface by hand. Discrete samples will be spaced in a 30m grid formation across the area to ensure that an even coverage of the site is achieved.
- Decontamination of sampling equipment will be undertaken before sampling and between samples by cleaning with “Decon 90/Xtran” and potable water.
- Disposable gloves will be worn for all sample collection.
- Where walls of excavations are present and are not proposed to be excavated and are deeper than 0.2m, discrete sampling will be undertaken from each soil type present every 10 lineal metres.
- Where walls of excavations are present and are not proposed to be excavated and are deeper than 0.2m, discrete sampling will be undertaken from each soil type present every 10 lineal metres.
- All samples will be given a unique identifier and marked on a plan.

## 8. BASIS FOR ASSESSMENT CRITERIA

### 8.1 Contaminants of Concern

Contaminants of concern associated with the Municipal Landfill:

- Asbestos
- PAHs
- Copper, lead, nickel, zinc
- Soluble fluoride
- Petroleum hydrocarbons

### 8.2 Soil

The guidelines proposed for the assessment of soil contamination at the site were sourced from the following references:

- NEPC (1999) National Environmental Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1) (NEPM).

The future landuse of the majority of the site is for commercial/ industrial landuse, zoning Business Park (B7) under Cessnock City Council's Local Environment Plan 2011. A small portion of the site along the eastern boundary with Swamp Creek is intended to be zoned Environmental Conservation (E2). Under this landuse, it is anticipated this portion of the site will be used for recreational activities such as dog walking, trail bike riding, walking and running. Guidelines for recreational/ open space landuse are considered to be the most relevant guidelines for protection of human health for this landuse. For protection of ecology, guidelines for areas of ecological significance are considered to be the most relevant.

The guidelines adopted for the site from the NEPM are as follows:

- HIL C – Health investigation level for recreational/ open space landuse. The HILs are applicable for assessing human health risk via all relevant pathways of exposure. The HILs are generic to all soil types and apply generally to a depth of 3 m below the surface for industrial use.
- EIL for areas of ecological significance – ecological investigations levels applicable for assessing risk to terrestrial ecosystems. EILs depend on specific soil physicochemical properties and generally apply to the top 2 m of soil.
- ESLs for areas of ecological significance – ecological screening levels developed for selected petroleum hydrocarbon compounds and fractions and are applicable for assessing risk to terrestrial ecosystems. These are also generally applicable to the top 2m of soil.
- Management Limits where petroleum hydrocarbon concentrations above these limits may indicate poor aesthetics, high odour and potentially explosive vapour. Management limits are to be applied after consideration of relevant ESLs and HSLs.

The applicable guidelines for heavy metals, PAHs and fluoride in soil are presented in **Table 8.1**. As there is no EIL for fluoride, fluoride concentrations will be assessed against the background concentration for the Smelter Site and Buffer Zone lands.

**Table 8.1 Soil Assessment Criteria (mg/kg) – Health and Ecological Investigation Levels**

Contaminant of Concern	HIL C	EIL
Fluoride	1200 <sup>1</sup>	4.3 <sup>3</sup>
Arsenic	300	40
Cadmium	90	-
Chromium (VI)	300	-
Chromium (III)	-	60 (1% clay)
Copper	17,000	45 <sup>2</sup>
Lead	600	470
Nickel	1200	9 <sup>2</sup>
Zinc	30,000	120 <sup>2</sup>
Mercury	80	-
Naphthalene	-	10
Carcinogenic PAHs (as BaP TEQ)	3	-
Total PAHs	300	-

*1 Site-specific recreational fluoride value calculated in the Preliminary Screening Level Health Risk Assessment for Fluoride and Aluminium (ENVIRON 2013)*

*2 EILs were calculated using the average CEC 4.1 meq/100g), soil pH (6.5) and total organic carbon (0.9%) values from 13 soil samples collected from the Municipal Landfill during February 2013 investigation. The NEPM (2013) EIL Spreadsheet was used to generate the numbers and a site-specific ambient background concentration (ABC) was not included, rather a default ABC was used as calculated in the EIL calculator*

*3 Background fluoride concentration for Smelter Site and Buffer Zone lands(Environ 2013)*

Petroleum hydrocarbons are assessed for vapour intrusion into a building. As recreational/ open space use criteria consider exposure scenarios such as parks and playgrounds, recreational areas and playing fields and limited use of buildings such as amenity blocks, Ramboll considers that the criteria for vapour intrusion for commercial/ industrial landuse is the most relevant at the site. The applicable vapour intrusion assessment criteria for petroleum hydrocarbons in soil are presented in **Table 8.2**.

**Table 8.2: Soil Assessment Criteria for Vapour Intrusion – HSL D (mg/kg) – Sand**

	0 to <1m	1m to <2m	2m to <4m	4m+
Toluene	NL <sup>1</sup>	NL	NL	NL
Ethylbenzene	NL	NL	NL	NL
Xylenes	230	NL	NL	NL
Naphthalene	NL	NL	NL	NL
Benzene	3	3	3	3
F1 <sup>3</sup> C6-C10	260	370	630	NL

F2 <sup>4</sup> >C10-C16	NL	NL	NL	NL
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1 The soil saturation concentration (C<sub>sat</sub>) is defined as the soil concentration at which the porewater phase cannot dissolve any more of an individual chemical. The soil vapour that is in equilibrium with the porewater will be at its maximum. If the derived soil HSL exceeds C<sub>sat</sub>, a soil vapour source concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or 'NL'.

2 (For soil texture classification undertaken in accord with AS 1726, the classifications of sand, silt and clay may be applied as coarse, fine with liquid limit <50% and fine with liquid limit >50% respectively, as the underlying properties to develop the HSLs may reasonably be selected to be similar. Where there is uncertainty, either a conservative approach may be adopted or laboratory analysis should be carried out.

3 To obtain F1 subtract the sum of BTEX concentrations from the C6-C10 fraction.

4 To obtain F2 subtract naphthalene from the >C10-C16 fraction.

ESLs and management limits are also available for petroleum hydrocarbons. ESLs for areas of ecological significance and Management Limits for open space landuse were considered the most conservative for the site. The applicable ESLs and management limits for petroleum hydrocarbons in soil are presented in **Table 8.3**.

**Table 8.3 ESLs and Management Limits for Petroleum Hydrocarbons in Soil (mg/kg)**

TPH fraction	Soil texture	ESLs (mg/kg dry soil)		Management Limits <sup>1</sup> (mg/kg dry soil)	
		Areas of Ecological Significance		Open Space	
F1 <sup>2,3</sup> C6- C10	Coarse	125*		700	
F2 >C10-C16	Coarse	25*		1000	
F3 >C16-C34	Coarse	-		2500	
F4 >C34-C40	Coarse	-		10,000	
Benzene	Coarse	10		-	
Toluene	Coarse	10		-	
Ethyl benzene	Coarse	1.5		-	
Xylene	Coarse	10		-	
Benzo(a)pyrene	Coarse	0.7		-	

1 Management limits are applied after consideration of relevant ESLs and HSLs.

2 Separate management limits for BTEX and naphthalene are not available hence these should not be subtracted from the relevant fractions to obtain F1 and F2.

3 To obtain F1, subtract the sum of BTEX from C6-C10 fraction.

The HSLs for asbestos are applicable for assessing human health risk via the exposure pathway of inhalation of airborne asbestos fibres and are presented in **Table 8.4**. The HSLs are generic to all soil types.

**Table 8.4 Health Screening Levels for Asbestos Contamination in Soil (w/w)**

Form of asbestos	Recreational C <sup>1</sup>
Bonded ACM	0.02%
FA and AF <sup>1</sup> (friable asbestos)	0.001%
All forms of asbestos	No visible asbestos for surface soil

*1 The screening level of 0.02% 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.*

Consistent with the guidance provided in the NEPM, the data was assessed against the above adopted site guidelines by:

- Comparing individual concentrations against the relevant guidelines and if discrete samples are in excess of the relevant guideline then;
- Comparing the 95% upper confidence limit of mean against the relevant guideline also ensuring that:
  - the standard deviation of the results is less than 50% of the relevant investigation or screening level, and
- no single value exceeds 250% of the relevant investigation or screening level.

## 9. QUALITY ASSURANCE AND QUALITY CONTROL

A quality assurance/ quality control (QA/QC) assessment is presented in **Tables 9.1, 9.2 and 9.3** below. An assessment was made of data completeness, comparability, representativeness, precision and accuracy based on field and laboratory considerations, as outlined in NSW EPA (2017) guidelines. These Data Quality Indicators (DQIs) are outlined in **Section 7.2.6**.

**Table 9.1 QA/QC Sampling and Analysis Methodology Assessment**

Sampling Methodology	Ramboll Assessment
Sampling Pattern and Locations	<p>Validation samples were collected on a grid spacing of 10 lineal metres on the walls and 30 m grid on the floor of the excavation.</p> <p>Due to the consistency of material across the walls of the excavation, every second sample was analysed (1 sample per 20 lineal metres). All remaining wall samples were placed on hold at the primary laboratory. Further analysis was not considered to be required based on the consistency of analyte concentrations in the validation samples analysed.</p> <p>Validation sampling locations were photographed and a photographic log is included in <b>Appendix 2</b>.</p>
Sampling Density	A total of 54 soil samples were analysed, 20 from the base and 34 from the walls of the excavation.
Sample depths	Validation samples from the walls of the excavation were targeted at a depth approximately half the wall height. There was no variation in stratigraphy in the walls, so multiple sample depths were not required. Base samples were collected from the surface of the excavation base.
Sample Collection Method	Soil samples were collected directly from the walls and base of the excavation using a shovel to loosen material at each sample location. Soil samples were collected by hand into laboratory-supplied glass jars.
Decontamination Procedures	Decontamination was not required as soil samples were collected by hand directly from the material loosened by the shovel. Dedicated disposable gloves were worn to collect each sample.
Sample handling and containers	Soil samples were placed into laboratory-supplied, acid-rinsed glass jars. Soil samples were placed on ice following collection and during transportation to the laboratory. The 500 ml sample for asbestos fines analysis was collected into a laboratory-supplied plastic zip-lock bag. These bags were then collected into a large plastic bag for transportation to the laboratory.
Detailed description of field screening protocols	<p>Field screening of validation samples for bonded asbestos &gt;7 mm was undertaken at the majority of validation sampling locations using a 7 mm hand-held sieve. Soil samples were collected into a 10L bucket, then manually transferred to the sieve. Sieving was undertaken over a blue tarpaulin to capture the fines. A photograph was taken of the oversize material retained on the sieve and of the fines. Where field screening was not undertaken, 10 L samples were collection for screening at the laboratory. Field notes are included in <b>Appendix 3</b>.</p> <p>Field screening for volatiles was not required, as volatiles were not the main contaminant of concern.</p>
Chain of Custody	<p>Samples were transported to the laboratory under chain of custody conditions. The chain of custody forms were signed by the laboratory on receipt of the samples. Chain of custody forms are included in <b>Appendix 4</b>.</p>

Sampling Methodology	Ramboll Assessment
Calibration of field equipment	No field equipment requiring calibration was used.
Sampling Logs	The lithology of validation soil samples was documented during sampling, as reported in <b>Table 1, Appendix 5</b> .

**Table 9.2 Field and Lab Quality Assurance and Quality Control**

Field and Lab QA/QC	Ramboll Assessment
Field quality control samples	<p>Seven intra-laboratory duplicate samples were collected and analysed for 54 primary samples, exceeding the targeted rate of 10%.</p> <p>Three inter-laboratory duplicate samples were collected for the 54 primary samples. A miscommunication with the primary laboratory resulted in the internal analyses of inter-laboratory duplicate T01_140319 and the subsequent triplicate rate of 3.7% slightly lower than the targeted rate of 5%.</p> <p>A rinsate blank sample was not collected as reusable sampling equipment (the spade) was used to loosen soil at the sampling location but did not touch the soil collected as the sample. Trip spike and trip blank samples were not required as volatile contaminants were not the main contaminants of concern.</p>
Field quality control results	<p>RPD results for soil were within acceptable limits, with the exception of the following exceedances:</p> <ul style="list-style-type: none"> <li>• ML_VAL10/D01_080319 RPD of 40% for nickel and 89 % for zinc</li> <li>• ML_VAL29/D03_100419 RPD of 62% for zinc</li> <li>• ML_VAL40/D04090419 RPD of 40% for nickel</li> <li>• ML_VAL40/T02_090419 RPD of 37% for zinc</li> <li>• ML_VAL60/D06_120419 RPD of 141% for copper, 115% for lead and 77% for zinc</li> <li>• ML_VAL60/T03_120419 RPD of 75% for copper, 73% for lead and 77% for zinc</li> </ul> <p>RPD results are included in <b>Table 2, Appendix 5</b>.</p>
NATA registered laboratory and NATA endorsed methods	<p>ALS was used as the primary laboratory and Eurofins was used as the secondary laboratory. ALS and Eurofins laboratory certificates are NATA stamped and both laboratories are accredited for the analyses performed for this assessment. Laboratory analytical reports are included in <b>Appendix 4</b>.</p>
Analytical methods	<p>A summary of analytical methods were included in the laboratory test certificates.</p>
Holding times	<p>Review of the COCs and laboratory certificates indicate that holding times were met.</p>
Practical Quantitation Limits (PQLs)	<p>PQLs for soil analytes were below the assessment criteria.</p>
Laboratory quality control samples	<p>Laboratory quality control samples including duplicates, laboratory control samples, matrix spikes, surrogate spikes and blanks were undertaken by the laboratories at appropriate frequencies.</p>
Laboratory quality control results	<p>All results for laboratory soil duplicates, laboratory control samples, matrix spikes and surrogates were acceptable, and no detections were made in blank samples.</p>

Assessment of the Data Quality Indicators of completeness, comparability, representativeness, precision and accuracy, which are outlined in **Section 6.2.6**, is made in **Table 9.3**.



**Table 9.3 QA/QC Assessment DQIs**

DQI	Ramboll Comments
Completeness	<p>Completeness is a measure of whether all the data necessary to meet the project objectives was collected.</p> <p>As noted in <b>Table 9.1</b>, validation soil samples were collected from the walls and base of the municipal landfill excavation at the nominated rate. Ramboll considers the investigation to be complete.</p>
Comparability	<p>Comparability is a measure of confidence that the data may be considered to be equivalent for each sampling and analysis event.</p> <p>Validation sample collection was completed by experienced personnel from Ramboll using standard operating procedures. The fieldwork was completed by Jordyn Kirsch, with assistance from Kirsty Greenfield and Joshua Blackwell. Jordyn has two years' experience and has completed the course Remove Non-Friable Asbestos (CPCCDE3014A). Kirsty Greenfield has over 15 years of experience, is a certified Site Contamination Specialist under EIANZ (No. SC40104) and has completed numerous field investigations at Hydro. Joshua Blackwell graduated from Newcastle University in 2019 and was supervised by Jordyn during field sieving of validation samples.</p> <p>The laboratory analysis was undertaken by NATA registered laboratories using accredited analytical methods.</p> <p>A miscommunication with the primary laboratory resulted in a primary sample (ML_VAL69) being analysed at the secondary laboratory. The secondary laboratory mistakenly reported total fluoride as opposed to soluble fluoride concentrations on the primary sample as well as all inter-laboratory duplicates (T02_090419 and T03_120419). Fluoride concentrations from the two laboratories are not comparable.</p> <p>Ramboll considers all other soil data collected during this investigation to be comparable, with the exception of total fluoride concentrations in inter-laboratory duplicate samples.</p>
Representativeness	<p>Representativeness is the confidence that the data is representative of each media present at the site.</p> <p>In the field, representativeness was achieved by completing an adequate number of validation sampling points to validate that the municipal landfill excavation was not contaminated.</p>
Precision	<p>Precision is a measure of the reproducibility of the data.</p> <p>In the field, Ramboll achieved precision by using standard operating procedures for the collection of soil samples and by collecting duplicate and triplicate samples for analysis.</p> <p>Intra-laboratory duplicates were collected at a rate of 14.81% while inter-laboratory duplicates were collected at a rate of 3.7%.</p> <p>All analytes presenting exceedances in the RPD criteria were below the assessment criteria, with the exception of ML_VAL40 in which the inter-laboratory duplicate reported a concentration exceeding the EIL for zinc.</p>
Accuracy	<p>Accuracy is a measure of the closeness of a measurement to the true parameter value.</p> <p>In the field, Ramboll achieved accuracy by using standard operating procedures for the collection of soil samples.</p> <p>At the laboratory, accuracy is assessed using blind replicate samples and split samples. As outlined in laboratory reports, all results for laboratory soil duplicates were acceptable and no detections were made in blank samples.</p>
Sensitivity	<p>Sensitivity is a measure of the suitability of the laboratory LOR against the adopted assessment criteria.</p> <p>The LOR values adopted by the primary laboratory were below the adopted assessment criteria with the exception of fluoride in one sample, ML_VAL69,</p>

DQI	Ramboll Comments
	<p>which was analysed at the secondary laboratory due to a mis-communication. The LOR for this sample was &lt;100 mg/kg, significantly higher than the LOR of &lt;1 mg/kg at the primary laboratory. Eurofins MGT indicated that 100 mg/kg is the standard LOR they use for fluoride analysis.</p> <p>Of the 53 samples analysed for soluble fluoride, 48 were reported at an LOR sufficiently below the lowest assessment criteria of 4.3mg/kg. For the remaining 5 samples, a reported value of &lt;5mg/kg was due to sample extract/digestate dilution. Half the LOR of 5 mg/kg was used for these samples for the calculation of the 95% upper confidence limit for soluble fluoride.</p>

Overall, the Data Quality Indicators of completeness, comparability, representativeness, precision and accuracy have been met. It is considered that the data is of suitable quality to meet the project objectives.

## 10. VALIDATION RESULTS

### 10.1 Visual Observations

#### 10.1.1 Municipal Landfill

The validation program included visual validation of the removal of buried wastes. A Ramboll Environmental Scientist was on-site during the remedial works to observe the removal of buried wastes from the Municipal Landfill. Buried wastes were observed to be located within a dark brown fill soil and comprised glass, metal, ceramic, ash and ACM fragments. The walls and base of the excavation were observed to be in a grey to white to yellow medium to coarse grained sand.

A photographic log was collected during and at the completion of the remedial works, as provided in **Appendix 2**.

#### 10.1.2 Other Dumped Wastes

On 11 April 2019, a site walkover was undertaken to locate the other dumped wastes identified in the Phase 2 ESA and RAP, including two fill mounds with asphalt near the western boundary fence line of Lot 436 and old tyres near the southern boundary fence line of Lot 436.

The two fill mounds of asphalt were unable to be located during a walkover of the western site boundary. The old tyres were located and collected for relocation to the Stockpile Area on Dickson Road. A photograph of the tyres is included in **Appendix 2**.

### 10.2 Asbestos Air Monitoring Results

Hazmat were engaged by CMA to complete air monitoring on each day of asbestos removal works at the Municipal Landfill. Four air monitors were located around the perimeter of the worksite. Air monitoring results were below detection on each day monitored. Asbestos air monitoring reports are provided in **Appendix 6**.

### 10.3 Asbestos Clearance Certificates

Hazmat were subcontracted by CMA to provide an asbestos clearance certificate at the completion of the remedial works. Hazmat completed inspections during the removal works and following completion of the excavation works. The Asbestos Clearance Certificates provided by Hazmat are included in **Appendix 7**.

### 10.4 Validation Sampling Results

#### 10.4.1 Asbestos Sieving Results

On-site sieving of 10 L soil samples was completed by a Ramboll Environmental Scientist to validate the removal of bonded asbestos from the walls and base of the excavation. The following methodology was used to complete this sampling:

- Sampling locations were marked out on a grid and recorded using a GPS
- A spade was used to collect the sample into a 10 L bucket
- A blue tarpaulin was laid out at the sample location to collect the sieved fines
- A hand-held 7 mm sieve was used to sieve the material from the bucket
- Once the 10 L sample had been sieved, the material retained on the sieve was photographed and recorded
- The fines material on the tarpaulin was also photographed and a 500 ml sample collected into a laboratory-supplied ziplock bag. The ziplock bag was labelled with the sample identification.

Forty-two validation samples were sieved on-site. No ACM fragments were retained on the sieve at any of the validation sampling locations. Photographs of the material retained on the sieve are

included in **Appendix 2**. A site plan showing sampling locations is included in **Figure 4, Appendix 1**.

The first eleven samples were collected into bulk bags and sieved at the laboratory. No ACM was identified in the laboratory results. The laboratory report is included in **Appendix 4**.

#### 10.4.2 Laboratory Analytical Results

One validation sample was collected into a laboratory-supplied acid-rinsed glass jar at each sampling location for laboratory analysis and one 500 ml ziplock bag of sieved fines material was also collected. Samples were labelled with a unique sample identification from ML\_VAL01 to ML\_VAL74. The GPS coordinates and lithology at each sampling location were recorded and a photograph was taken.

Validation soil samples were analysed for soluble fluoride, copper, nickel, lead, zinc, PAHs, TRH and BTEX. A summary of the laboratory results compared to the validation criteria is included in **Table 10.1**.

**Table 10.1 Validation Soil Results – Summary Table (mg/kg)**

Analyte	n	Detections	Maximum	n > Human Health Screening Criteria	n > Terrestrial Ecological Screening Criteria
ACM >7 mm	53	0	<LOR	0 above HSL C 0.02%	-
AF/FA	53	0	<LOR	0 above HSL 0.001%	-
Asbestos trace analysis	53	0	<LOR	-	-
Benzene	53	0	<LOR	0 above HSL D (sand 0-<1 m) 3 mg/kg	0 above ESL (AES) (coarse) 10 mg/kg
Toluene	53	0	<LOR	0 above HSL D (sand 0-<1 m) NL	0 above ESL (AES) (coarse) 10 mg/kg
Ethylbenzene	53	0	<LOR	0 above HSL D (sand 0-<1 m) NL	0 above ESL (AES) (coarse) 1.5 mg/kg
Total Xylenes	53	0	<LOR	0 above HSL D (sand 0-<1 m) 230 mg/kg	0 above ESL (AES) (coarse) 10 mg/kg
F1 (TRH C <sub>6</sub> -C <sub>10</sub> minus BTEX)	53	0	<LOR	0 above HSL D (sand 0-<1 m) 260 mg/kg	-
F2 (TRH >C <sub>10</sub> -C <sub>16</sub> minus naphthalene)	53	0	<LOR	0 above HSL D (sand 0-<1 m) NL	-
TRH C <sub>6</sub> -C <sub>10</sub>	53	0	<LOR	0 above ML (open space) 700 mg/kg	0 above ESL (AES) 125 mg/kg
TRH >C <sub>10</sub> -C <sub>16</sub>	53	0	<LOR	0 above ML (open space) 1000 mg/kg	0 above ESL (AES) 25 mg/kg
TRH >C <sub>16</sub> -C <sub>34</sub>	53	0	<LOR	0 above ML (open space) 2500 mg/kg	-
TRH >C <sub>34</sub> -C <sub>40</sub>	53	0	<LOR	0 above ML (open space) 10,000 mg/kg	-
Naphthalene	53	0	<LOR	0 above HSL D NL	0 above EIL (AES) 10 mg/kg

Analyte	n	Detections	Maximum	n > Human Health Screening Criteria	n > Terrestrial Ecological Screening Criteria
Benzo(a)pyrene	53	0	<LOR	-	3 above ESL (open space) 0.7 mg/kg
Benzo(a)pyrene TEQ	53	0	<LOR	0 above HIL C 3 mg/kg	-
Total PAHs	53	0	<LOR	0 above HIL C 300 mg/kg	-
Soluble Fluoride	53	8	11	0 above HIL C 440 mg/kg	10 above EIL (open space) 4.3 mg/kg
Copper	53	2	7	0 above HIL C 17,000 mg/kg	0 above site-specific EIL (open space) 45 mg/kg
Lead	53	11	46	0 above HIL C 600 mg/kg	0 above generic ACL (open space) 470 mg/kg
Nickel	53	22	7	0 above HIL C 1200 mg/kg	0 above site-specific EIL (open space) 9 mg/kg
Zinc	53	35	160	0 above HIL C 30,000 mg/kg	1 above site-specific EIL (open space) 120 mg/kg

*n* number of samples  
 - No criteria available/used  
 NL Non-limiting  
 <PQL Less than the practical quantitation limit  
 AES Area of Ecological Significance

Concentrations of asbestos, PAHs and TRH/BTEX were below the limit of reporting and below the site criteria. Concentrations of copper, lead and nickel were below the site criteria.

Soluble fluoride was identified at concentrations exceeding the site-specific ecological criteria in ten validation samples. The 95% upper confidence limit (UCL) soluble fluoride concentration is 2.79 mg/kg, below the site criteria. ML\_VAL69 was excluded from the UCL calculation due to its reported total fluoride concentration, rather than soluble fluoride.

Zinc was identified at concentrations exceeding the site-specific ecological criteria in inter-laboratory duplicate T02\_090419. The duplicate value was adopted as a conservative approach. The 95% UCL zinc concentration is 49.05 mg/kg, below the site criteria. UCL calculations are included in **Appendix 8**.

A site plan showing validation sampling locations included in **Figure 4, Appendix 1**. Laboratory analytical reports are included in **Appendix 4**. Validation sampling results are tabulated in **Appendix 5**. Field notes are included in **Appendix 3**.

### 10.5 Survey

A survey of the final excavation footprint was undertaken at the completion of the remedial works. The survey indicated that the volume of the excavation was approximately 9,399 m<sup>3</sup>. A copy of the survey is provided in **Appendix 9**.

### 10.6 Final Landform

Following the completion of remedial works at the Municipal Landfill, the excavation was reshaped by pushing in the sides and then importing material to create a free draining surface. A total of 3580.93 tonnes of material was imported from a stockpile located at the Smelter Site. The final landform was observed to generally be a level surface, with no areas of ponding.

The stockpile at the Smelter Site comprises material excavated from within the Buffer Zone for the construction of the Hunter Expressway in 2012. Ramboll completed an Excavated Natural Material (ENM) assessment in 2012 prior to stockpiling of the material at the Smelter Site. A copy of the ENM assessment is included in **Appendix 10**.

## 11. MATERIAL TRACKING

### 11.1 Tracking of Waste Removed from Municipal Landfill

Materials excavated from the Municipal Landfill were transported to the Stockpile Area on Dickson Road via the weighbridge at Hydro and weights of each truckload were recorded for materials tracking purposes.

Weighbridge tracking information indicates that a total of 15,271.16 tonnes of material was relocated from Municipal Landfill to the Stockpile Area on Dickson Road.

A copy of the weighbridge tracking information is included in **Appendix 11**.

### 11.2 Tracking of Material Imported to Backfill

Material from the ENM stockpile at the Smelter Site used to backfill the Municipal Landfill excavation was transported over the weighbridge for material tracking purposes. A total of 3580.93 tonnes of ENM stockpile material was relocated to Municipal Landfill.

A copy of the weighbridge tracking information is included in **Appendix 11**.

## 12. REGULATORY REQUIREMENTS

On 16 November 2018, NSW EPA made a change to the Protection of the Environment Operations (Waste) Regulation 2014 to prohibit the exhumation of waste at current or former landfills. Hydro requested and received written approval from NSW EPA on 21 January 2019 to exhume waste from the Municipal Landfill under their Environment Protection Licence 1548. The approval was subject to thirteen conditions, as outlined in **Table 12.1**. Compliance with these conditions is also described in **Table 12.1**.

**Table 12.1 NSW EPA Approval Conditions and Compliance Information**

Condition	Compliance Information
The exhuming of waste is restricted to the old Municipal Landfill and other subsidence related waste deposition areas as proposed by Ramboll but does not include the old Dixon Road Landfill, exhuming of any waste from this area is prohibited by clause 110A of the Regulation	Remedial works were completed at Municipal Landfill only. No works were undertaken at the Dickson Road landfill.
The exhuming of waste permitted by condition 1 above must be undertaken in accordance with CMA's Work Method Statement dated 3/11/2018 Rev C as provided to the EPA by Ramboll on 8 January 2019 and Emergency Response Plan dated 10/11/2018 as provided to the EPA by Ramboll on 21 December 2018	Remedial works were completed in accordance with CMA's Work Method Statement dated 3/11/2018 Rev C and Emergency Response Plan dated 10/11/2018.
Prior to commencement of works the EPA must be provided with a signed copy of the Work Method Statement referred to in condition 2 of this approval	Hydro provided to NSW EPA via email a signed copy of the Work Method Statement.
All works associated with this approval are to be overseen by an appropriate qualified environmental scientist	Remedial works were overseen by Ramboll Environmental Scientist Kirsty Greenfield, who has 15 years of experience and is certified as a Site Contamination Specialist CEnvP No. SC40104 under the Environment Institute Australia and New Zealand (EIANZ).
All works associated with this approval that relate to any asbestos containing material excavation, handling, movement and storage are to be overseen by a suitably qualified industrial hygienist and comply with all legislative requirements and codes of practices relating to asbestos	Asbestos works were overseen by Hazmat Occupational Hygienist and Licenced Asbestos Assessor (LAA001366) Dr. Jeffrey Yu, who has 10 years of experience. Compliance with legislative requirements and codes of practices relating to asbestos included the following: Identification of an asbestos work area and a clean area, with a decontamination unit at the boundary Mandatory personal protective equipment (PPE) within the asbestos work area, including coveralls and half face respirator Air monitoring on the boundaries of both the Municipal Landfill and the Dickson Road Stockpile Area



Condition	Compliance Information
<p>The storage of any asbestos containing waste material is to be wetted down at all times to prevent asbestos fibres from becoming airborne or otherwise escaping, regardless of weather conditions, when the waste is not covered and must be covered with impervious cover that will prevent the escape of all asbestos fibres or dust when works cease at the each of each day</p>	<p>Use of water sprays to prevent dust generation during landfill exhumation and tipping off of waste</p> <p>Water sprays were used to wet down the waste materials being exhumed from the Municipal Landfill. Waste materials stockpiled at the Dickson Road Stockpile Area were covered with Bidim A34 geofabric material.</p>
<p>The storage must, once deposition from the former landfill sites is completed, be continually covered with an impervious cover that will prevent the escape of all asbestos fibres or dust. The cover must remain in place until the waste is disposed of</p>	<p>The stockpile of waste material at the Dickson Road Stockpile Area has been covered with xx material, which will remain in place until the waste is disposed of. The Dickson Road Stockpile Area has been fenced to prevent unauthorised access.</p>
<p>The cover material must be suitable for its intended use and must not rip, tear or be damaged by exposure to any weather conditions that would allow dust of asbestos fibres to escape</p>	<p>The material used to cover the temporary stockpile at the Dickson Road Stockpile Area was Bidim A34 geofabric. The joints were overlapped, glued and stapled in accordance with the installation guide.</p>
<p>All trucks are to be covered prior to leaving any waste exhumation area and must remain covered until arriving at the storage site</p>	<p>Trucks transporting waste from the Municipal Landfill to the Dickson Road Stockpile Area were covered prior to leaving Municipal Landfill until arrival at the Dickson Road Stockpile Area.</p>
<p>Truck tipping waste off at any locations must not generate any visible dust or asbestos fibres</p>	<p>Dust from tipping of waste at the Dickson Road Stockpile Area was controlled by the use of water sprays during tipping.</p>
<p>Any unexpected finds are to be immediately reported to the EPA's Environment Line Telephone Service on 131 555</p>	<p>No unexpected finds were uncovered during the remedial works.</p>
<p>A containment vessel shall be available at all times on or directly adjacent to any excavation site that is suitable to fully contain and isolate any unexpected finds</p>	<p>CMA sourced a plastic lined bin, which was placed at the Municipal Landfill for the duration of the remedial works.</p>
<p>72 hours prior to the commencement of any works associated with this approval, Hydro or its representatives must notify the EPA via</p>	<p>Hydro notified the EPA via email 72 hours prior to the commencement of works.</p>

Condition	Compliance Information
hunter.region@epa.nsw.gov.au that works are due to commence	

A copy of the approval from NSW EPA is included in **Appendix 12**. Remedial works at the Municipal Landfill were completed in accordance with NSW EPA's approval conditions.

## 14. CONCLUSIONS

Ramboll Australia Pty Ltd was engaged by Hydro Aluminium Kurri Kurri Pty to validate the remediation of the Municipal Landfill located within the Hydro Buffer Land.

A Phase 2 Environmental Site Assessment completed at the Municipal Landfill in April 2014 confirmed the presence of buried municipal waste materials and impacts to soil in the form of asbestos, lead and polycyclic aromatic hydrocarbons. Minor impacts to the soil matrix from concentrations of soluble fluoride, petroleum hydrocarbons, copper, nickel and zinc exceeding the ecological criteria were also identified.

The presence of municipal waste materials and impacted soil was considered to pose an unacceptable risk to human health and the environment in the context of the current land use and the proposed commercial/ industrial use and represents an impact on visual amenity. A remediation program was detailed in a Remedial Action Plan, which identified that the preferred remedial strategy was excavation of the waste and impacted materials and relocation to the engineered containment cell proposed to be constructed on the Smelter Site.

### 14.1 Summary of Findings

Remediation and validation works at the Municipal Landfill were completed between February and April 2019, including the following works:

- Preparation for site works, including felling and mulching of trees located within the Municipal Landfill, set up of environmental controls including sediment fencing, berms and demarcation of a contaminated zone at the location of the Municipal Landfill and a non-contaminated zone outside the excavation area
- Bulk excavation of wastes from the Municipal Landfill and loading wastes directly into trucks for transportation to the designated stockpile area located on Dickson Road within the Smelter Site
- Safe work measures for asbestos work
- Materials tracking over smelter weighbridge to record mass of material removed
- Hen picking of ACM fragments from the excavation by Aztech
- Completion of asbestos clearance certificates by Hazmat
- Collection of validation samples by Ramboll, laboratory analysis by ALS and Eurofins|MGT
- Survey of the final excavation footprint by Veris
- Backfilling of the excavation with Excavated Natural Material (EMN) stockpiled at the Smelter Site
- Placement of felled trees over the backfilled area to complete the final landform.

Validation of the removal of wastes and contaminated soil from the Municipal Landfill was achieved via multiple lines of evidence, including:

- Visual observation of the removal of wastes
- Asbestos air monitoring during remedial works
- Hen picking of ACM fragments from the excavation surface
- Provision of Asbestos Clearance Certificates at the completion of the works
- On-site sieving of validation samples to validate the removal of bonded ACM fragments
- Analysis of validation soil samples for contaminants of concern identified during the Phase 2 ESA: PAHs, asbestos, soluble fluoride, TRH, BTEX, copper, lead, nickel and zinc
- Comparison of validation soil results to validation criteria for the most sensitive future landuse of Environmental Conservation (E2)

Remediation and validation works were completed in accordance with Ramboll (2018) Remedial Action Plan and in accordance with the conditions of NSW EPA's written approval to exhume a landfill.

## 14.2 Statement of Validation

Based on observations made of the final remedial excavation at Municipal Landfill and the validation analytical results, it is considered that the site is suitable for the proposed Business Park (B7) and Environmental Conservation (E2) land use.

Remediation via source removal will also result in improvements to groundwater quality within the former landfill site, where elevated zinc and nitrate concentrations were identified within a localised, discontinuous shallow aquifer during the Phase 2 ESA investigations. No on-going long term management of groundwater is required.

## 15. REFERENCES

- Environ Australia Pty Ltd (October 2013) Phase 1 ESA, Hydro Kurri Kurri Aluminium Smelter
- Environ Australia Pty Ltd (April 2014) Phase 2 Environmental Site Assessment, Parcel 9 (2014a)
- Environ Australia Pty Ltd (April 2014) Phase 2 Environmental Site Assessment, Former Kurri Kurri Municipal Landfill, Hart Road, Loxford, NSW (2014b)
- Hunter Catchment Management Trust (HCTM 2000) Wallis and Fishery Creeks Total Catchment Management Strategy
- NEPC (1999) National Environmental Protection (Assessment of Site Contamination) Amendment Measure (NEPM) 2013
- New South Wales Department of Environment and Conservation (NSW DEC 2006) Guidelines for the NSW Site Auditor Scheme (Second Edition)
- New South Wales Department of Environment and Conservation (NSW DEC 2007) Guidelines for the Assessment and Management of Groundwater Contamination
- Ramboll (Ramboll 2018) Remedial Action Plan, Lots 435, 436 and 437 DP755231, Kurri Kurri NSW

## 16. LIMITATIONS

Ramboll Australia Pty Ltd prepared this report in accordance with the scope of work as outlined in our proposal to Hydro Aluminium Pty Ltd and in accordance with our understanding and interpretation of current regulatory standards.

A representative program of sampling and laboratory analyses was undertaken as part of this investigation, based on past and present known uses of the Site. While every care has been taken, concentrations of contaminants measured may not be representative of conditions between the locations sampled and investigated. We cannot therefore preclude the presence of materials that may be hazardous.

Site conditions may change over time. This report is based on conditions encountered at the Site at the time of the report and Ramboll disclaims responsibility for any changes that may have occurred after this time.

The conclusions presented in this report represent Ramboll's professional judgment based on information made available during the course of this assignment and are true and correct to the best of Ramboll's knowledge as at the date of the assessment.

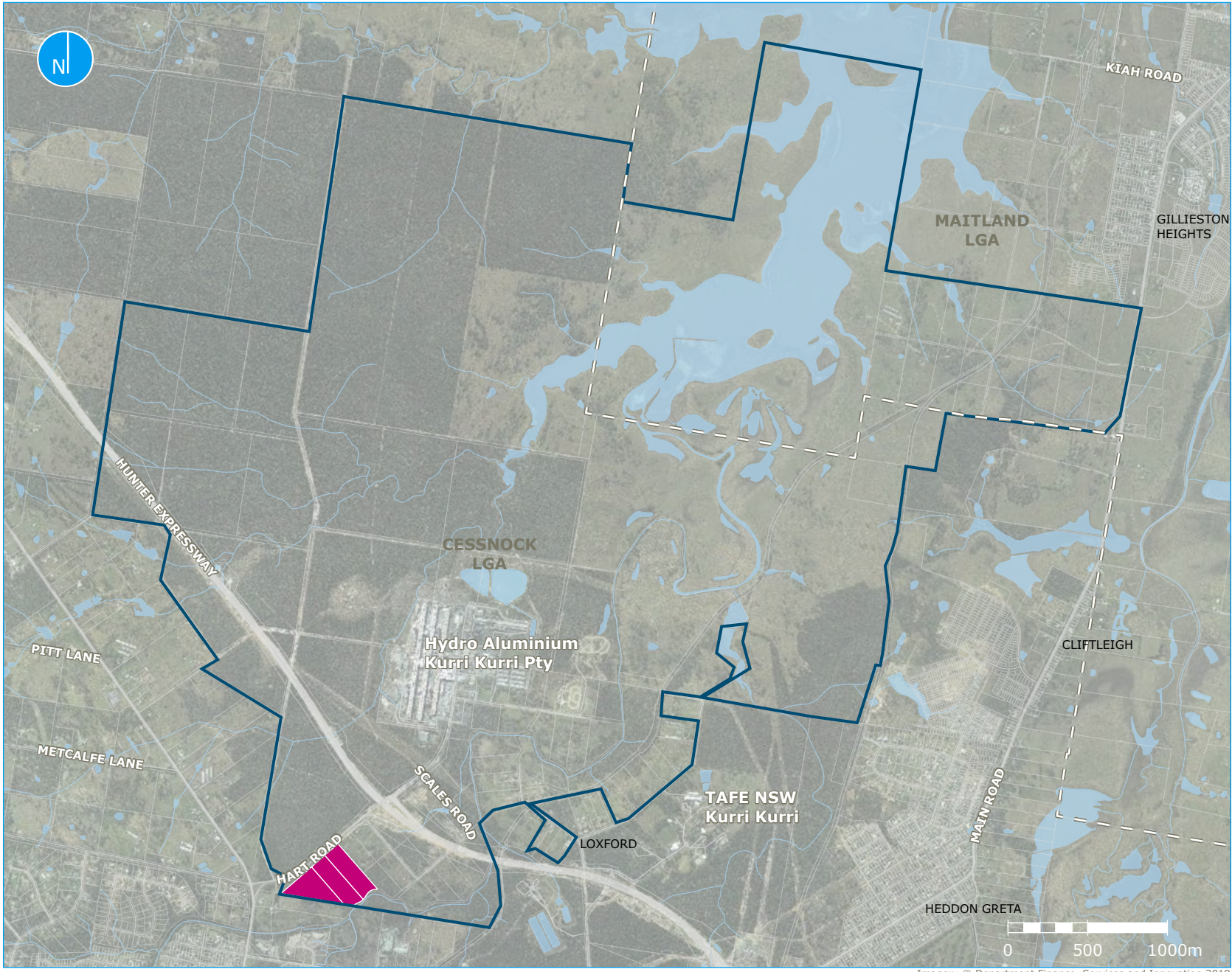
Ramboll did not independently verify all of the written or oral information provided to Ramboll during the course of this investigation. While Ramboll has no reason to doubt the accuracy of the information provided to it, the report is complete and accurate only to the extent that the information provided to Ramboll was itself complete and accurate.

This report does not purport to give legal advice. This advice can only be given by qualified legal advisors.




### 16.1 User Reliance

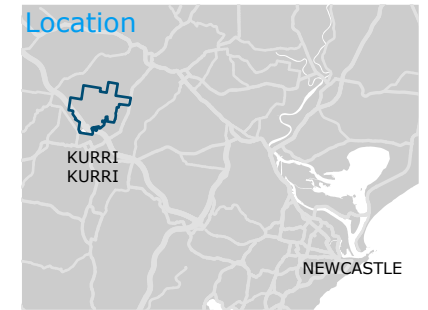
This report has been prepared exclusively for Hydro Aluminium Pty Ltd and may not be relied upon by any other person or entity without Ramboll's express written permission.

## APPENDIX 1 FIGURES



**Legend**

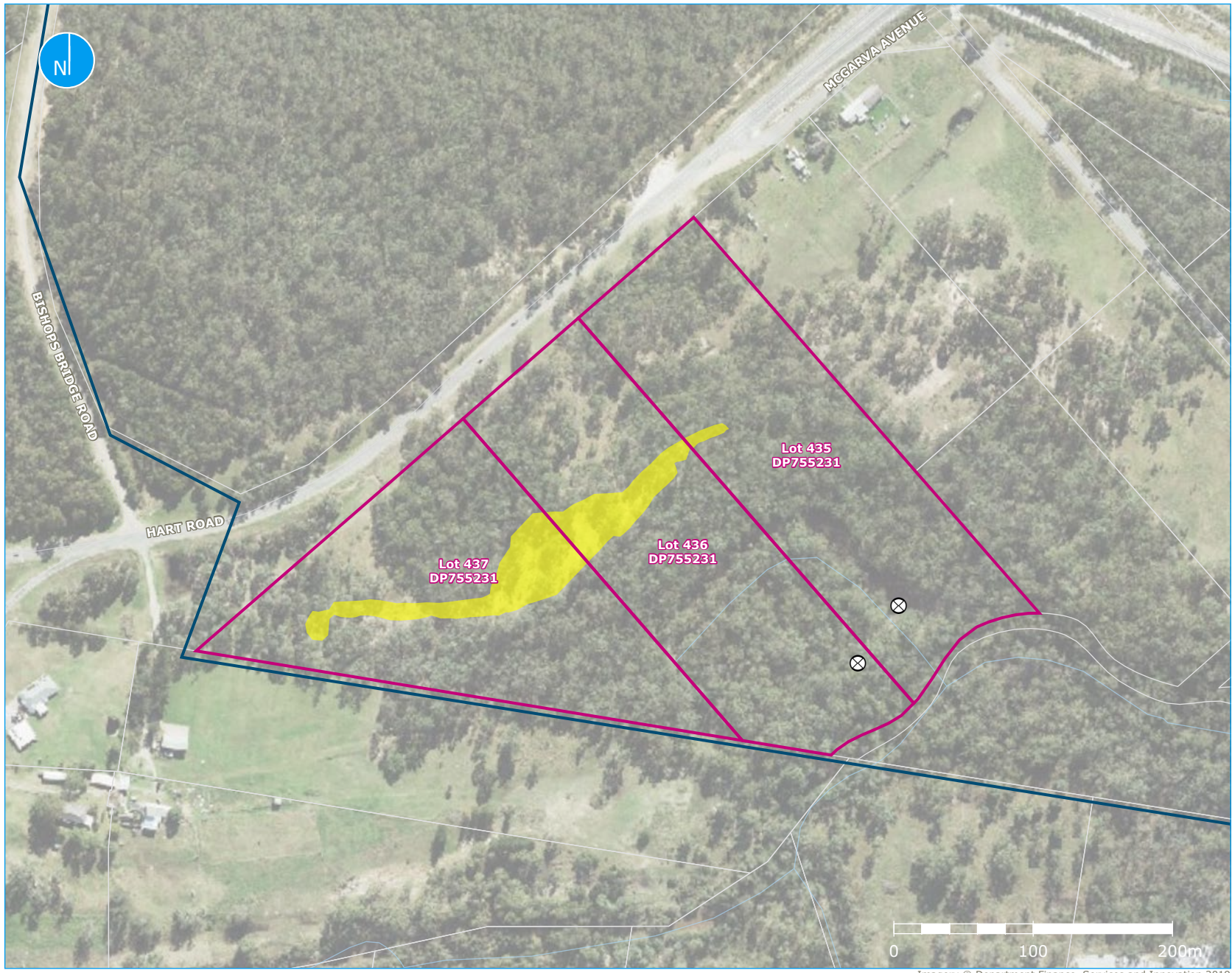
-  Hydro owned land
-  LGA boundary
-  Municipal Landfill affected lot



1:35,000

FIGURE 1 | Site locality





- Legend**
- Hydro owned land
  - Municipal Landfill affected lot
  - X Car tyre
  - Landfill extent

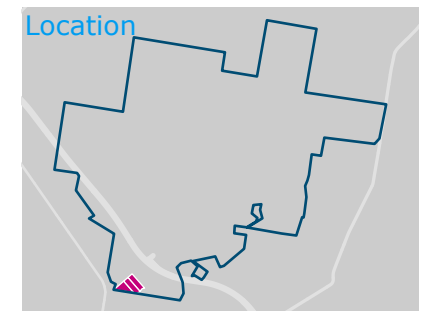
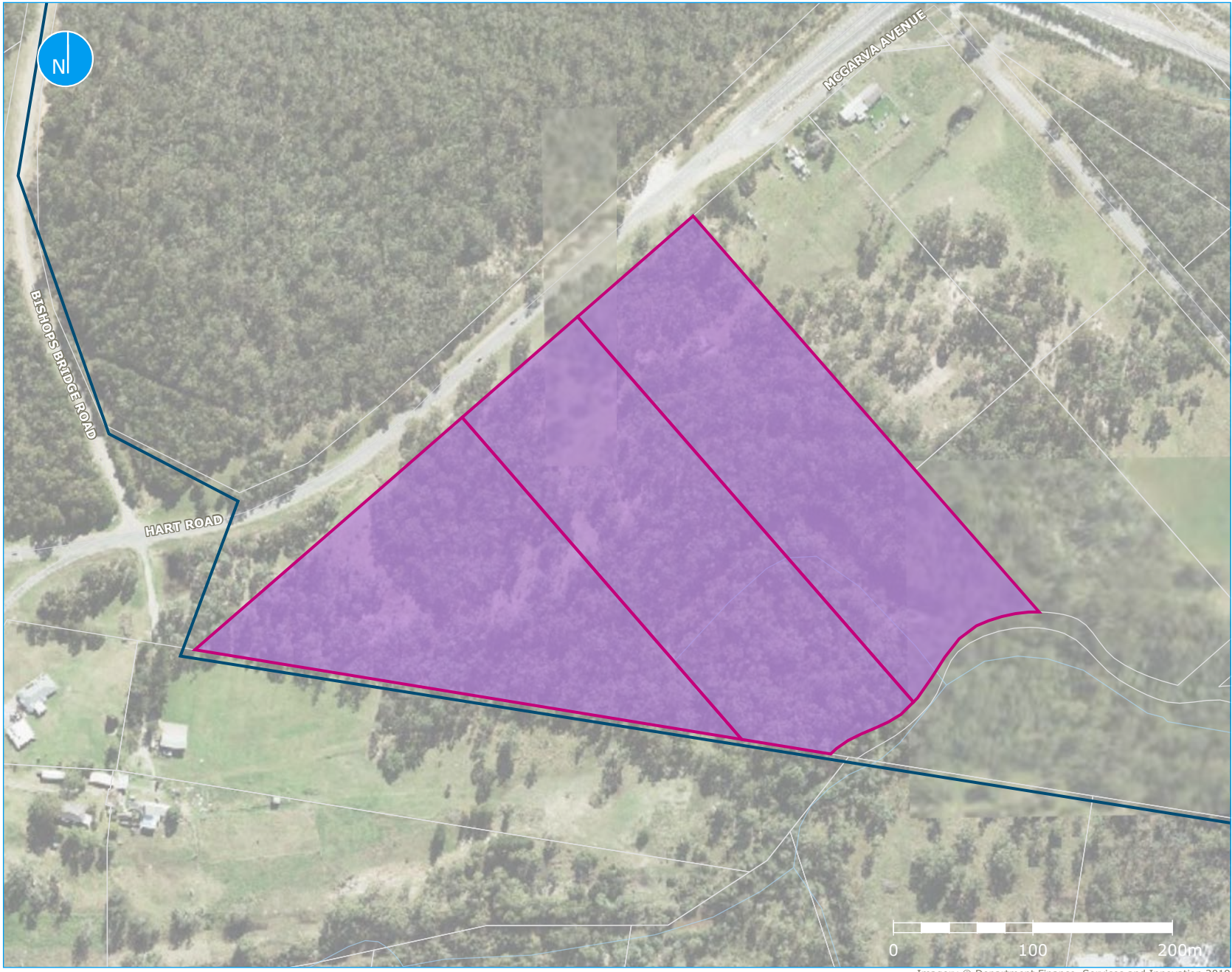
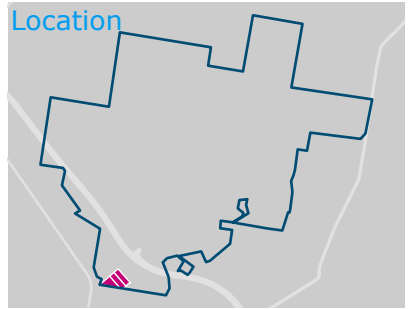


FIGURE 3 | Extent of Landfill



**Legend**

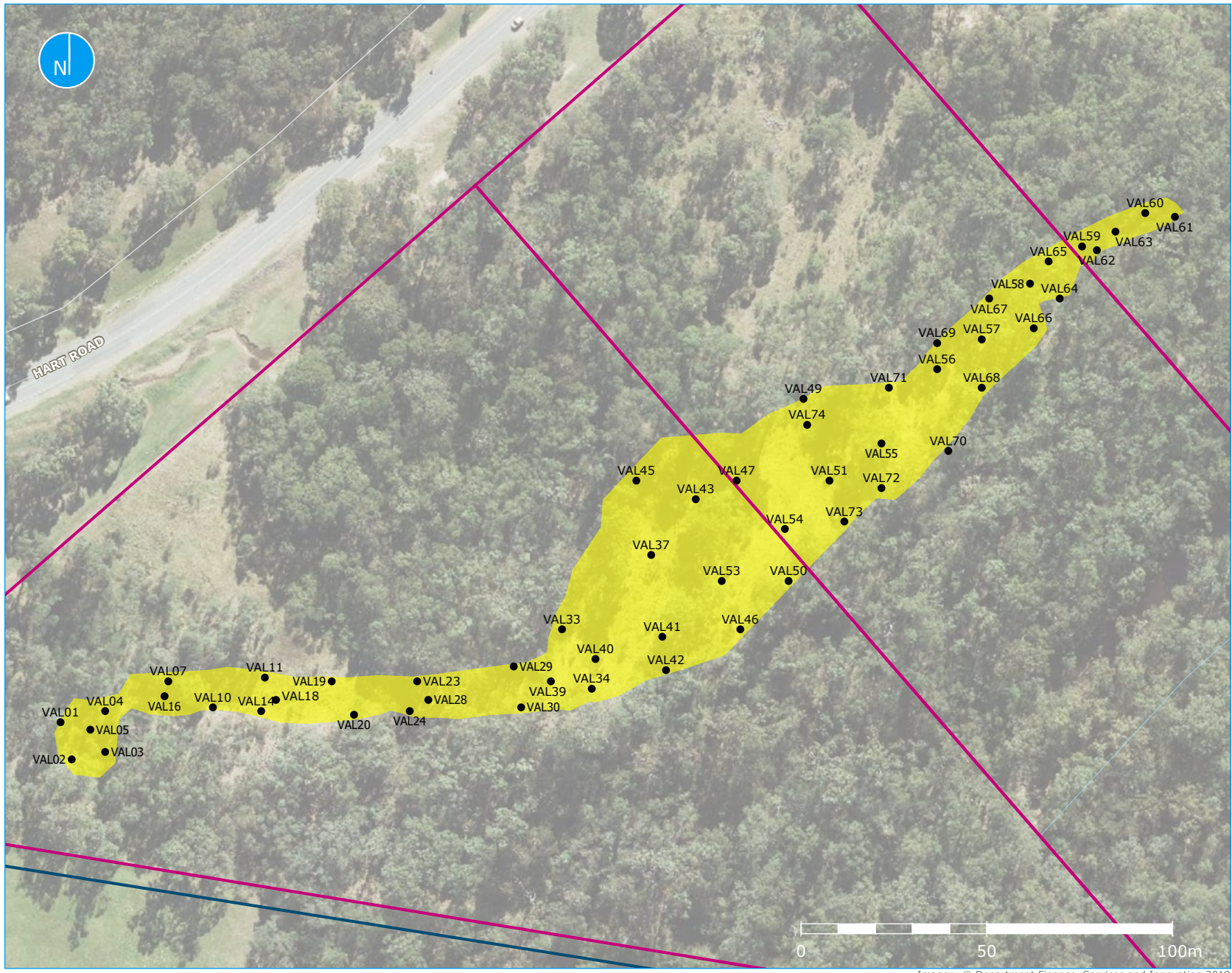
- Hydro owned land
- Proposed zoning for Industrial and Environmental Conservation use



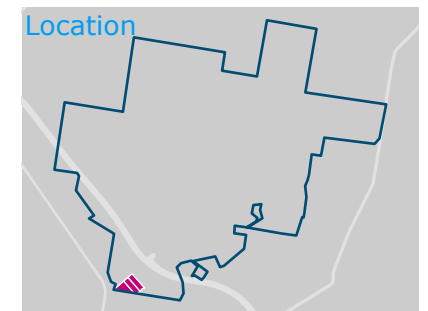
Imagery © Department Finance, Services and Innovation 2019

1:4,000

FIGURE 2 | Draft Land Use Strategy



- Legend**
- Hydro owned land
  - Municipal Landfill affected lot
  - Sampling location
  - Landfill extent



Imagery © Department Finance, Services and Innovation 2019

1:1,500

FIGURE 4 | Validation Sampling Plan

## APPENDIX 2 PHOTO LOG

**1. Municipal Landfill Pre Remedial Works.jpg**

West end (Lot 437) of landfill post vegetation clearing. Surface materials comprise brown sand to silty sand with visible waste including plastic, metal and glass.

Long: 151.469353  
Lat: -32.80217



**1a. Municipal Landfill Pre Remedial Works.jpg**

West mid-section (Lot 437) of landfill post vegetation clearing. Waste materials visible at surface.

Long: 151.469613  
Lat: -32.801965



**1b. Municipal Landfill Pre Remedial Works.jpg**

West mid-section (adjacent landfill bottleneck Lot 437) post vegetation clearing. Visible waste in surface materials.

Long: 151.469837  
Lat: -32.801968



**1c. Municipal Landfill Pre Remedial Works.jpg**

North east extent of landfill (Lot 435). Rusted car bodies partially buried in gully.

Long: 151.472751  
Lat: -32.800786



**2. Waste Material Characterisation.jpg**

Consolidated waste material west mid-section (Lot 437). Waste observed to include metal, glass and ACM fragments.

Long: 151.469686  
Lat: -32.802066



**2a. Waste Material Characterisation.jpg**

Consolidated waste material west section (Lot 437). Heavy soil content. Waste observed to include metal, glass and ACM fragments.

Long: 151.469686  
Lat: -32.802066



**2b. Waste Material Characterisation.jpg**

Waste material identified in north wall (adjacent landfill bottleneck Lot 437) during remedial works. Waste observed to include glass, plastic, ceramic and ACM fragments.

Long: 151.47082  
Lat: -32.801971



**3. Municipal Landfill During Remedial Works.jpg**

Bulk excavation of waste material west end (Lot 437). Asbestos controls in place.

Long: 151.469384  
Lat: -32.802242



**3a. Municipal Landfill During Remedial Works.jpg**

Cleared waste material from west section (Lot 437). Asbestos controls in place.

Long: 151.469384  
Lat: -32.802242



**3b. Municipal Landfill  
During Remedial  
Works.jpg**

Cleared waste material  
west mid-section (Lot 437)  
prior to final tidy up.

Long: 151.469718  
Lat: -32.802039



**3c. Municipal Landfill  
During Remedial  
Works.jpg**

Bulk excavation of waste  
material west mid-section  
(adjacent landfill bottleneck  
Lot 437). Asbestos controls  
in place.

Long: 151.470519  
Lat: -32.802058



**3d. Municipal Landfill  
During Remedial  
Works.jpg**

Bulk excavation of waste  
material north east section  
(Lot 436). View to the  
west.

Long: 151.472223  
Lat: -32.801086





**4. Municipal Landfill Post Remedial Work.jpg**

Cleared waste material from mid-section (Lot 436) prior to final tidy up.

Long: 151.471735

Lat: -32.801495



**4a. Municipal Landfill Post Remedial Works.jpg**

Final excavation west mid-section (Lot 437). View west.

Long: 151.470466

Lat: -32.80203



**5. Validation Sampling ML\_VAL01 Sample Close Up.jpg**

Wall sample collected from west section (Lot 437). Sample collected from pale brown to yellow, fine grained sand. No remnant waste observed at sampling location.

Long: 151.46939

Lat: -32.802105



**5a. Validation Sampling  
ML\_VAL01 Sample  
Location.jpg**

Bulk bag collected for  
laboratory sieving of soils  
to 7mm for ACM.

Long: 151.46939  
Lat: -32.802105



**6. Validation Sampling  
ML\_VAL07 Close Up.jpg**

Wall sample collected from  
west section (Lot 437).  
Sample collected from pale  
brown, fine grained sand.  
No remnant waste  
observed at sampling  
location.

Long: 151.469724  
Lat: -32.80198



**6a. Validation Sampling  
ML\_VAL07 Location.jpg**

Bulk bag collected for  
laboratory sieving of soils  
to 7mm for ACM.

Long: 151.469724  
Lat: -32.80198



**7. Validation Sampling  
ML\_VAL18 Close Up.jpg**

Base sample collected from west section (Lot 437). Sample collected from pale brown to orange fine grained sand. No remnant waste observed at sampling location.

Long: 151.470038  
Lat: -32.802003



**7a. Validation Sampling  
ML\_VAL18 Location.jpg**

Bulk bag collected for laboratory sieving of soils to 7mm for ACM.

Long: 151.470038  
Lat: -32.802003



**8. Validation Sampling  
ML\_VAL28 Close Up.jpg**

Base sample collected from west mid-section (adjacent landfill bottleneck Lot 437). Sample collected from pale brown, fine grained sand. No remnant waste observed at sampling location.

Long: 151.47046  
Lat: -32.801976



**8a. Validation Sampling  
ML\_VAL28 Location.jpg**

Bulk bag collected for  
laboratory sieving of soils  
to 7mm for ACM.

Long: 151.47046

Lat: -32.801976



**9. Validation Sampling  
ML\_VAL39 with seive.jpg**

Sieving of soil to 7mm for  
ACM taken place in the  
field. NO ACM fragments  
retained on sieve.

Long: 151.47074

Lat: -32.802004



**9a. Validation Sampling  
ML\_VAL39 close up in  
location.jpg**

Sample collected from pale  
brown / yellow, fine to  
medium grained sand.

Long: 151.47074

Lat: -32.802004



**9b. Validation Sampling  
ML\_VAL39 Location.jpg**

Base sample collected from west mid-section (adjacent and east of landfill bottleneck Lot 437) following final tidy up. No remnant waste observed at sampling location.

Long: 151.47074  
Lat: -32.802004



**10. Validation Sampling  
ML\_VAL50 with seive.jpg**

Sieving of soil to 7mm for ACM taken place in the field. NO ACM fragments retained on sieve. QA sample collected.

Long: 151.471434  
Lat: -32.801779



**10a. Validation Sampling  
ML\_VAL50 close up in  
location.jpg**

Sample collected from pale brown, fine grained silty sand.

Long: 151.471434  
Lat: -32.801779



**10b. Validation Sampling  
ML\_VAL50 Location.jpg**

Wall sample collected from mid-section (Lot 437) following final tidy up. No remnant waste observed at sampling location.

Long: 151.471434  
Lat: -32.801779



**11. Validation Sampling  
ML\_VAL58 with seive.jpg**

Sieving of soil to 7mm for ACM taken place in the field. NO ACM fragments retained on sieve.

Long: 151.472294  
Lat: -32.801031



**11a. Validation Sampling  
ML\_VAL58 close up in  
location.jpg**

Sample collected from yellow, fine grained sand.

Long: 151.472294  
Lat: -32.801031



**11b. Validation Sampling  
ML\_VAL58 Location.jpg**

Base sample collected from north east section (Lot 436) following final tidy up. No remnant waste observed at sampling location.

Long: 151.472294  
Lat: -32.801031



**12. Validation Sampling  
ML\_VAL63 with seive.jpg**

Sieving of soil to 7mm for ACM taken place in the field. NO ACM fragments retained on sieve.

Long: 151.472587  
Lat: -32.800786



**12a. Validation Sampling  
ML\_VAL63 close up in  
location.jpg**

Sample collected from pale brown to yellow, fine to medium grained sand.

Long: 151.472587  
Lat: -32.800786



**12b. Validation Sampling  
ML\_VAL63 Location.jpg**

Wall sample collected from north east section (Lot 435) following final tidy up. No remnant waste observed at sampling location.

Long: 151.472587  
Lat: -32.800786



**13. Validation Sampling  
ML\_VAL68 with seive.jpg**

Sieving of soil to 7mm for ACM taken place in the field. NO ACM fragments retained on sieve.

Long: 151.472066  
Lat: -32.80127



**13a. Validation Sampling  
ML\_VAL68 close up in  
location .jpg**

Sample collected from yellow coarse-grained sand.

Long: 151.472066  
Lat: -32.80127





**13b. Validation Sampling  
ML\_VAL68 Location.jpg**

Wall sample collected from north east section (Lot 436) following final tidy up. No remnant waste observed at sampling location.

Long: 151.472066  
Lat: -32.80127



**14. Validation Sampling  
ML\_VAL 74 with  
seive.jpg**

Sieving of soil to 7mm for ACM taken place in the field. NO ACM fragments retained on sieve.

Long: 151.47152  
Lat: -32.801449



**14a. Validation Sampling  
ML\_VAL74 close up in  
location.jpg**

Sample collected from white fine-grained sand.

Long: 151.47152  
Lat: -32.801449



**14b. Validation Sampling  
ML\_VAL74 Location.jpg**

Base sample collected from mid-section upper shelf (Lot 436) following final tidy up. No remnant waste observed at sampling location.

Long: 151.47152  
Lat: -32.801449



**15. Site Overview during  
Remedial Works.JPG**

Aerial footage during bulk excavation. View east over Lot 437.

Long: 151.469077  
Lat: -32.802138



**15a. Site Overview  
during Remedial  
Works.JPG**

Aerial footage during bulk excavation. View south west over Lot 436 and Lot 435.

Long: 151.472633  
Lat: -32.800869



**16. Car Tyre.jpg**

Car tyre removed from south east portion of Lot 436.

Long: 151.473942  
Lat: -32.802063



**16a. Car Tyre.jpg**

Car tyre removed from south portion of Lot 435.

Long: 151.473623  
Lat: -32.802432



**17. Final Landform Post Remediation.jpg**

View to the north east (Lot 435) post remediation.

Long: No location recorded  
Lat:



**17a. Final Landform Post Remediation.jpg**

View to the south east (Lot 436) post remediation.

Long: No location recorded  
Lat:



**17b. Final Landform Post Remediation.jpg**

View to the west (Lot 437) post remediation.

Long: No location recorded  
Lat:



## APPENDIX 3 FIELD NOTES

## Daily Field Report

Project Name: Buffer Zone Remediation	Ramboll Personnel: J.Kirsch
Project No: 318000585	
Date: 1/03 29/02/19	
Start time: 6.30	Subcontractors: CMA / AZTECH
Finish time: 3.00 pm	
Weather: Partly cloudy. Slight (30%) chance of a shower about the Lower Hunter. Near zero chance of rain elsewhere. Light winds becoming easterly 15 to 20 km/h in the late afternoon, tending 20 to 30 km/h about coast. Overnight temperatures falling to between 14 and 17 with daytime temperatures reaching 26 to 31.	

Field Report: 6:30am toolbox meeting with AZTECH and CMA. HAZMAT happy with 12 Bowditch, today working on 1A + 16 Extreme UV rating today. Hot weather.

Stockpile area - UHF Channel 13 - Inside flagging P2 dust mask to be worn. P3 outside flagging

Municipal landfill clean area and carpark. PPE required within red zone. Dust monitors still need to be put in place. Cars need to be reversed against fence so that water truck can access road. 500mm deep cuts to monitor for unexpected wastes. Trucks - tyres to be checked and cleaned before exiting the site. No truck goes onto the road without being cleaned. Sprinklers will extend down landfill as works progress.

HAZMAT installing dust monitors. (8am)

Decon unit - generator turned on, push waste pump button, tyvek suit stays on in first shower, second room suit comes off place in bag, after final shower mask comes off. Full face if going near works. Iain contact no. 0439 765 12A.

Half face respirator suitable when sampling away from works. Channel 13 on UHF for municipal landfill.

Egress points every 30m or battered at sides for access of personnel or fauna within the municipal excavation. Need to order full face respirator and tyvek boot covers.

Work commence at landfill at 10:40am.

Some sprinklers not working resulting in inadequate dust suppression. Trevor to return with new sprinkler heads while AZTECH work to clear the blockage.

12:00pm stop works to fix sprinkler heads. 12:41 material kit with spray gun from water cart.

13:43 - AZTECH spraying bucket loads during deposition into trucks. HAZ048 and HAZ54 located in green zone. Natural material evident below landfill waste (yellow/pale brown sand) material to be coated with dustex for weekend. 14:42 stockpile to be dampened down for weekend. JK return radio and head off-site

15:00 -

## Daily Field Report

Project Name: Buffer Zone Remediation	Ramboll Personnel: J.Kirsch
Project No: 318000585	
Date: 04/03/19	
Start time: 6:30 am.	Subcontractors: CMA
Finish time: 3:30 pm	
Weather: Sunny. Light winds becoming east to southeasterly 15 to 20 km/h during the afternoon then becoming light during the evening. Overnight temperatures falling to between 15 and 18 with daytime temperatures reaching 30 to 35.	

**Field Report:** Arrive on site 6.30am attend CMA toolbox talk for buffer zone / municipal landfill. Temperatures top of 35°C. Shane advises that if too much dust is produced at municipal then works are to stop. Horton load out occurring today. Water cart to flood municipal first up. CMA and PZTECH working to start pumps and fill water tanks / set up work area. 7.59 Jeffrey from hazmat has indicated that the truck road to municipal is generating a lot of dust - JK to discuss with CMA supervisor when at site. Water cart drenching stockpile 8:18 first truck loaded at Municipal landfill. Sprinklers going - excavator bucket loads being hosed by genny during deposit into truck. Discussion with Shane at 8.48 access roads to municipal to be suppressed with water to minimise dust. Water being added to municipal increasing the tonnes going over the weigh bridge. 9.15 Spoke to Trevor and Shane about supplying dust gauge reports. (asbestos air monitoring). Touch base with Shaun - contact Lisa? are they still coming out. 11.30 discussion with Iain to confirm compliance with JSA if wearing a half face respirator when load out not occurring excavator bucket is down. 13.30 works on hold while genny is repaired (nozzle detached and body run over by truck). 14.35 hitting the stockpile with the canon from the watercart to suppress dust - mix through with the excavator. Last load out at 2.50. Water cart hitting material with canon till tank empty. Water cart to be washed down with genny before heading out to main road. JK off-site at municipal to return UHF radio and then head to office.

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## Daily Field Report

Project Name: Buffer Zone Remediation	Ramboll Personnel: J.Kirsch
Project No: 318000585	
Date: 05/03/18	
Start time: 6:30am	Subcontractors: CMA
Finish time: 3:30pm	AZTECH

Weather: Sunny. Winds northeasterly 15 to 25 km/h becoming light in the morning then becoming northeasterly 20 to 30 km/h in the early afternoon.

BoM

**Field Report:** Arrive on site at 6:30am for toolbox talk. Chance of thunderstorm this afternoon. Tops of 36°C high humidity. Excavator being refuelled, set up of decon unit, refill of water tank. 7:50 excavator working to create trench through centre of stockpile for better water retention. Jeffrey out installing dust gauges. First load out at 8am. Two trucks running, one without a trailer. 10:20 excavator and HAZMAT pull up for smoke. 11:08 JK suit up to enter red zone, works are extending past line of sight from green zone. Trucks will not be recorded during this time. 2:20 JK suit down through decon unit. Material observed in stockpile comprised of glass bottles, ACM fragments, empty (crushed and rusted out drums), natural wood and plastic, bricks. Discussed with Iain and Trevor that a few glass fragments are OK but remaining asbestos, metal or large pockets of waste is not suitable. Generally if material is scraped back to natural there will only be a few loose bottles, glass shards that remain. Last truck run at 3:11. J.K off-site at 3:30 after returning radio.

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## Daily Field Report

Project Name: Buffer Zone Remediation	Ramboll Personnel: J.Kirsch
Project No: 318000585	<i>S. Maxwell</i>
Date: 06/03/19	
Start time: 6:30	Subcontractors: CMA / AZTECH
Finish time: 2:00	

**Weather:** Mostly sunny morning. Very high (90%) chance of showers in the afternoon and evening. The chance of a thunderstorm in the afternoon and evening. Winds north to northeasterly 15 to 20 km/h increasing to 35 km/h before shifting southerly 20 to 30 km/h in the early afternoon.

**Field Report:** 6:30 JK and sm arrive on-site for toolbox. Possible severe thunderstorm this afternoon. Test rake at 2 Dawes. JK visit 2 Dawes with sm for set up of taking trial JK on site at Municipal 8:39. Kirsty and Andrew S on site - discuss no room for over excavation, Craig to bulk out material and a small excavator to go through and tidy up any remaining pockets of waste. Water cart running back and forth hitting stockpile with water canon. 10:44 trucks stop for smoko, winds picking up a lot of dust at landfill, not from impacted material. 11:35 loader at municipal pushing gravel road up to extend where current load outs are occurring. water cart spraying areas where loader has scratched up roadbase. 1:15 works called off as dust suppression not adequate (CMA's call). Last truck run at 1:05 pm. JK head to 2 Dawes. Report sm and JK off-site at 3pm

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6/3/19

## Buffer zone walkover

- Municipal landfill - SW corner cleared back to natural yellow sand + complete. Using a large excavator bucket - ok for bulking out waste but not suitable for tidying up small volumes at the end. Need a smaller bucket or smaller machine to ~~bulk out~~ remove small volumes at the end.
- 2 + 4 Dawes raking trial 2 10x10 squares Steve Maxwell + 1 CMA guy
- 8 Dawes; 8 Bowditch, 10, 12, 20 Bowditch ready for clearance
- 12, 16, 18 Bowditch, Grahams Lane, Horton Rd - hand picking then clearance

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## Daily Field Report

Project Name: Buffer Zone Remediation	Ramboll Personnel: J.Kirsch
Project No: 318000585	
Date: 7/3/19	
Start time: 8:00	Subcontractors: CMA / AZTECH
Finish time:	
Weather: cloudy. slight (20%) chance of rain. Winds south to south easterly 15 to 20 km/h turning easterly 20 to 30 km during the morning and early afternoon.	

BoM

Field Report: JK on site at 8:00am dust suppression appears to be good (rain last night). Currently appears to be two trucks running. JK to suit up to observe load outs as they progress down to the east, truck movements will not be recorded at this time. 11:00 JK down and out of red zone. Materials identified in waste pile comprise ACM, glass bottles, steel, tin cans and natural wood. No unexpected finds. During time in red zone JK walked cleared area and hand picked glass and some ACM fragments from revegetated area. These were not large amounts and likely got mixed up in the fine sand during clearing with the excavator. Some large (~10-15cm) ACM fragments were identified at the surface of walls of the excavation. These fragments were removed. 11:50 - excess water on truck access road - trucks stopped running, mud to be cleared from West Rd. Trucks commence leaving Municipal Area from 12:55pm. JK log on to Hunter meeting 1pm until 2:40pm. Discussion with Andrew/Trevor (CMA) to progress JK with sampling. Last truck loaded out at 3:37pm. 3:45 JK return WHF. off-site at 3:41.

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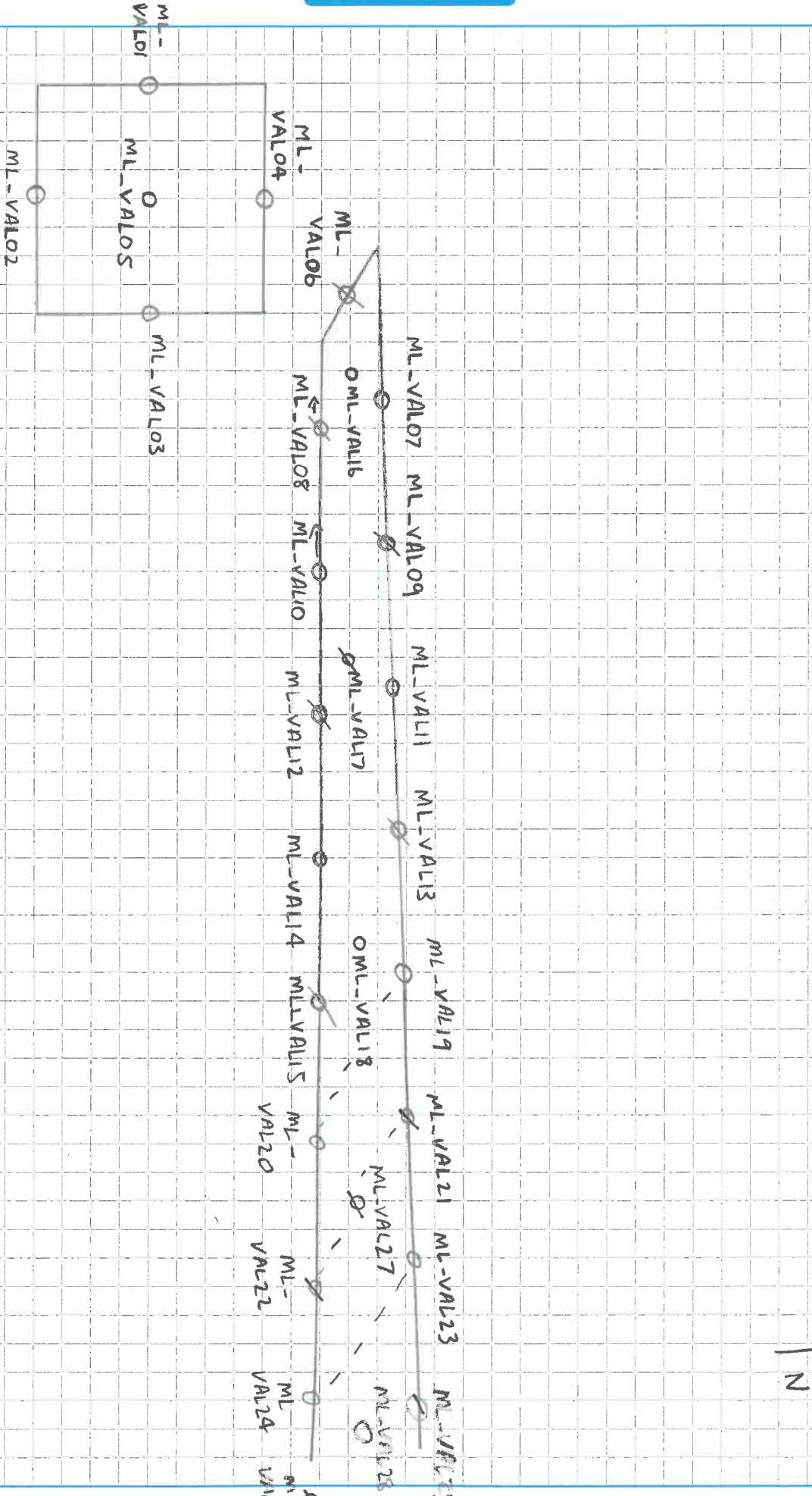
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Early works Remediation - Municipal Landfill  
 Validation sampling completed on 8/3/19



## Daily Field Report

Project Name: Buffer Zone Remediation	Ramboll Personnel: J.Kirsch
Project No: 318000585	
Date: 11/3/19	
Start time: 9.50	Subcontractors: CMA, AZTECH
Finish time:	

**Weather:** mostly sunny. Light winds becoming south to south-westerly 15 to 20 km/h in the middle of the day then tending north east to southeasterly in the evening.

BoM

**Field Report:** JK on site at 9.50 after dropping Fridays samples to the lab. Discussion with excavator driver inferred that rusted car bodies were removed from the waste material prior to Ramboll's arrival on site. JK collect additional wooden stakes ~11.30am to mark out sampling locations. Green painted stakes to indicate the location of a sample, red stakes to indicate where removal of suspected remaining landfill to occur. While putting in stakes, ACM fragments were found within sand material between sampling locations VAL06 and VAL07. Additional fragments were also identified in waste material at ground level adjacent VAL06. Both locations were marked with a red stake, ACM fragments were removed and photos were taken of the ACM fragments. one area ~10 x 10 x 2m deep excavated a few meters south of main trench. Previous site walkovers had identified waste materials in this area.

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## Daily Field Report

Project Name: Buffer Zone Remediation	Ramboll Personnel: J.Kirsch
Project No: 318000585	
Date: 17/3/19	
Start time: 9.30	Subcontractors: CMA
Finish time: 3.30	

Weather: BoM

Field Report: JK on-site ~ 9.30 am. Pick up UHF, collect stakes and sign on at CMA. Collect validation samples at municipal landfill. ML-VAL19 - MLVAL28 (duplicate and triplicate collected at ML-VAL20). ACM fragments identified at surface in approx 3 locations. (2 noted to contain fill material with remnant steel, glass etc.) ACM fragments collected and placed on waste pile. Half of samples to be submitted for analysis, half to be placed on hold.

2.45 - Pick up duct tape to goose neck samples prior to delivery at the lab. Lunch.

3.15 - Return radio - drop samples to lab. JK off-site ~ 3.30

## Daily Field Report

Buffer Zone Remediation

J. Kirsch

Municipal Landfill

AZTECH / CMA.

15/3/19

8.00

12.00

JK on-site 8am. Suit up place red stakes to indicate areas that need to be further excavated. Recheck coordinates (don't appear correct in Avenza map plots (possibly due to bad service in area?). Coordinates appear to improve when collected from the top edge of the excavation.

Remaining landfill observed at dog leg where excavation bottle necks - photos collected - additional excavation of this area completed - observed by Ramboll.

Monitoring wells have been excavated around but remain in place. Wells will need to be decommissioned prior to validation works in the area. Remaining waste pile located on western face of excavation.

Natural material observed ~1m above final excavation surface where municipal bottle necks out - unlikely to have been the case throughout - likely as a result of the underlying natural gully - rising to the east and west. Caution should be taken not to overexcavate this material as works progress. AZTECH relocating sprinklers - may interfere with sample location pegs. Dan to reinstate pegs if disturbed. JK offsite 12pm.

Daily Field Log 18 March 2019

Municipal Landfill

- 8:00 Arrive at Hydro, check in with AS, collect radio from Shane at CMA office
- 8:30 Arrive at Municipal Landfill - talk to Craig excavator operator
- 8:50 Load truck, working from New section, using water sprays, no dust, water cart came by + spraying loads
- 9:02 trucks running
- 10:30 leave ML, go to Smelter to meet Kery + Andrew walkovers of Wangara Poultry Sheds, 27 Bowden Scales Ave, 12 Horton, Dickson Rd
- 2pm Arrive back at ML trucks still running
- 3pm trucks stopped for the day



8am Arrive on site

9am Meet Lisa Richards from EPA. Complete visit to ML + Stockpile Area + Hydro Site

11:30pm Visit to Bowditch excavator removing surface fill with building debris + Alum from house foot print + septic tank

Walked over to 12 Bowditch to check areas removed. Rain has exposed fragments over dog kennel footprint - needs to be scraped up

2pm Returns to ML, suit up and walk length of excavation. Last truck had finished for the day. More Alum observed in walls of excavation - needs to be cleaned out before backfill.

Municipal Landfill Material Tracking and Unexpected Finds

Project No: 31800585  
 Client Name: Hydro  
 Project Name: Buffer Zone Remediation Supervision  
 Project Site: Municipal Landfill

Comments

Date	Time	Source Reference	Soil %	Waste %	Other Inclusions	Comments	Unexpected Finds	
11/3/19	10:40	Lot 435 Lot 436 Lot 437	100	-	Glass bottles <input type="checkbox"/> Ceramics <input type="checkbox"/> Ash <input type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Fabric <input type="checkbox"/> Concrete <input type="checkbox"/> Metal <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> ACM Fragments <input type="checkbox"/>	Natural wood i.e. branches	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) _____
11/3/19	10:50	Lot 435 Lot 436 Lot 437	49	1	Glass bottles <input checked="" type="checkbox"/> Ceramics <input type="checkbox"/> Ash <input type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Fabric <input type="checkbox"/> Concrete <input type="checkbox"/> Metal <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> ACM Fragments <input type="checkbox"/>	Natural wood	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) _____
11/3/19	11:34	Lot 435 Lot 436 Lot 437	95	5	Glass bottles <input type="checkbox"/> Ceramics <input type="checkbox"/> Ash <input type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Fabric <input type="checkbox"/> Concrete <input type="checkbox"/> Metal <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> ACM Fragments <input type="checkbox"/>	Natural wood	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) _____
11/3/19	11:41	Lot 435 Lot 436 Lot 437	95	5	Glass bottles <input type="checkbox"/> Ceramics <input type="checkbox"/> Ash <input type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Fabric <input type="checkbox"/> Concrete <input type="checkbox"/> Metal <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> ACM Fragments <input type="checkbox"/>	Natural wood	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) _____
11/3/19	12:17	Lot 435 Lot 436 Lot 437	90	5	Glass bottles <input type="checkbox"/> Ceramics <input type="checkbox"/> Ash <input type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Fabric <input type="checkbox"/> Concrete <input type="checkbox"/> Metal <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> ACM Fragments <input type="checkbox"/>	Natural wood	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) _____
11/3/19	13:19	Lot 435 Lot 436 Lot 437	90	10	Glass bottles <input type="checkbox"/> Ceramics <input type="checkbox"/> Ash <input type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Fabric <input type="checkbox"/> Concrete <input type="checkbox"/> Metal <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> ACM Fragments <input type="checkbox"/>	Natural wood	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) _____
11/3/19	13:42	Lot 435 Lot 436 Lot 437	90	10	Glass bottles <input type="checkbox"/> Ceramics <input type="checkbox"/> Ash <input type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Fabric <input type="checkbox"/> Concrete <input type="checkbox"/> Metal <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> ACM Fragments <input type="checkbox"/>	Natural wood	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) _____
11/3/19	14:20	Lot 435 Lot 436 Lot 437	90	10	Glass bottles <input type="checkbox"/> Ceramics <input type="checkbox"/> Ash <input type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Fabric <input type="checkbox"/> Concrete <input type="checkbox"/> Metal <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> ACM Fragments <input type="checkbox"/>	Natural wood	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) _____
11/3/19	14:34	Lot 435 Lot 436 Lot 437	90	10	Glass bottles <input type="checkbox"/> Ceramics <input type="checkbox"/> Ash <input type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Fabric <input type="checkbox"/> Concrete <input type="checkbox"/> Metal <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> ACM Fragments <input type="checkbox"/>	Natural wood	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) _____
11/3/19	8:18	Lot 435 Lot 436 Lot 437	95	5	Glass bottles <input type="checkbox"/> Ceramics <input type="checkbox"/> Ash <input type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Fabric <input type="checkbox"/> Concrete <input type="checkbox"/> Metal <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> ACM Fragments <input type="checkbox"/>	Natural wood	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) _____
11/3/19	8:40	Lot 435 Lot 436 Lot 437	95	5	Glass bottles <input type="checkbox"/> Ceramics <input type="checkbox"/> Ash <input type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Fabric <input type="checkbox"/> Concrete <input type="checkbox"/> Metal <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> ACM Fragments <input type="checkbox"/>	Natural wood	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) _____
11/3/19	9:16	Lot 435 Lot 436 Lot 437	95	5	Glass bottles <input type="checkbox"/> Ceramics <input type="checkbox"/> Ash <input type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Fabric <input type="checkbox"/> Concrete <input type="checkbox"/> Metal <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> ACM Fragments <input type="checkbox"/>	Natural wood	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) _____

Municipal Landfill Material Tracking and Unexpected Finds

Project No: 318000585  
 Client Name: Hydro  
 Project Name: Buffer Zone Remediation Supervision  
 Project Site: Municipal Landfill

Comments

Date	Time	Source Reference	Soil %	Waste %	Other Inclusions	Comments	Unexpected Finds
4/3/19	9:26	Lot 435 □ Lot 436 □ Lot 437 □	75	5	Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input checked="" type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> Bricks <input type="checkbox"/> Wood <input type="checkbox"/>	Natural wood	Aluminum smelter waste (As spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) <input type="checkbox"/> Drums or containers filled with product <input type="checkbox"/>
4/3/19	9:59	Lot 435 □ Lot 436 □ Lot 437 □	75	5	Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input checked="" type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> Bricks <input type="checkbox"/> Wood <input type="checkbox"/>	Natural wood	Aluminum smelter waste (As spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) <input type="checkbox"/> Drums or containers filled with product <input type="checkbox"/>
4/3/19	10:23	Lot 435 □ Lot 436 □ Lot 437 □	95	5	Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input checked="" type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> Bricks <input type="checkbox"/> Wood <input type="checkbox"/>		Aluminum smelter waste (As spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) <input type="checkbox"/> Drums or containers filled with product <input type="checkbox"/>
4/3/19	10:34	Lot 435 □ Lot 436 □ Lot 437 □	95	5	Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input checked="" type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> Bricks <input type="checkbox"/> Wood <input type="checkbox"/>		Aluminum smelter waste (As spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) <input type="checkbox"/> Drums or containers filled with product <input type="checkbox"/>
4/3/19	10:50	Lot 435 □ Lot 436 □ Lot 437 □	95	5	Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input checked="" type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> Bricks <input type="checkbox"/> Wood <input type="checkbox"/>		Aluminum smelter waste (As spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) <input type="checkbox"/> Drums or containers filled with product <input type="checkbox"/>
4/3/19	11:21	Lot 435 □ Lot 436 □ Lot 437 □	95	5	Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input checked="" type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> Bricks <input type="checkbox"/> Wood <input type="checkbox"/>		Aluminum smelter waste (As spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) <input type="checkbox"/> Drums or containers filled with product <input type="checkbox"/>
4/3/19	11:32	Lot 435 □ Lot 436 □ Lot 437 □	90	10	Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input checked="" type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> Bricks <input type="checkbox"/> Wood <input type="checkbox"/>	Natural wood	Aluminum smelter waste (As spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) <input type="checkbox"/> Drums or containers filled with product <input type="checkbox"/>
4/3/19	11:40	Lot 435 □ Lot 436 □ Lot 437 □	90	10	Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input checked="" type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> Bricks <input type="checkbox"/> Wood <input type="checkbox"/>	Natural wood	Aluminum smelter waste (As spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) <input type="checkbox"/> Drums or containers filled with product <input type="checkbox"/>
4/3/19	12:00	Lot 435 □ Lot 436 □ Lot 437 □	95	5	Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input checked="" type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> Bricks <input type="checkbox"/> Wood <input type="checkbox"/>	Natural wood	Aluminum smelter waste (As spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) <input type="checkbox"/> Drums or containers filled with product <input type="checkbox"/>
4/3/19	12:11	Lot 435 □ Lot 436 □ Lot 437 □	90	10	Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input checked="" type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> Bricks <input type="checkbox"/> Wood <input type="checkbox"/>	Natural wood Corrugated crushed sheet metal	Aluminum smelter waste (As spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) <input type="checkbox"/> Drums or containers filled with product <input type="checkbox"/>
4/3/19	12:18	Lot 435 □ Lot 436 □ Lot 437 □	95	5	Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input checked="" type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> Bricks <input type="checkbox"/> Wood <input type="checkbox"/>		Aluminum smelter waste (As spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) <input type="checkbox"/> Drums or containers filled with product <input type="checkbox"/>
4/3/19	12:36	Lot 435 □ Lot 436 □ Lot 437 □	95	5	Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input checked="" type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> Bricks <input type="checkbox"/> Wood <input type="checkbox"/>	Natural wood	Aluminum smelter waste (As spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) <input type="checkbox"/> Drums or containers filled with product <input type="checkbox"/>

\*Item or per truck load, whichever comes first

Municipal Landfill Material Tracking and Unexpected Finds

Project No: 313000585  
 Client Name: Hydro  
 Project Name: Buffer Zone Remediation Supervision  
 Project Site: Municipal Landfill

Comments

Date	Time	Source Reference	Soil %	Waste %	Other Inclusions	Comments	Unexpected Finds
4/15/19	1:12	Lot 435 □ Lot 436 □ Lot 437 □	45	5	Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input checked="" type="checkbox"/> Wire <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/>	Natural wood. Bricks <input type="checkbox"/> Wood <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) _____	
4/13/19	2:14	Lot 435 □ Lot 436 □ Lot 437 □	90	10	Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input checked="" type="checkbox"/> Wire <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/>	Natural wood. Bricks <input type="checkbox"/> Wood <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) _____	
4/13/19	2:40	Lot 435 □ Lot 436 □ Lot 437 □	95	5	Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input checked="" type="checkbox"/> Wire <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/>	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) _____	
4/13/19	2:50	Lot 435 □ Lot 436 □ Lot 437 □	95	5	Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input checked="" type="checkbox"/> Wire <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/>	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) _____	
5/3/19	8:00	Lot 435 □ Lot 436 □ Lot 437 □	95	5	Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input checked="" type="checkbox"/> Wire <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/>	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) _____	
5/3/19	8:07	Lot 435 □ Lot 436 □ Lot 437 □	95	5	Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input checked="" type="checkbox"/> Wire <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/>	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) _____	
5/3/19	8:27	Lot 435 □ Lot 436 □ Lot 437 □	95	5	Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input checked="" type="checkbox"/> Wire <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/>	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) _____	
5/3/19	8:39	Lot 435 □ Lot 436 □ Lot 437 □	95	5	Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input checked="" type="checkbox"/> Wire <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/>	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) _____	
5/3/19	9:04	Lot 435 □ Lot 436 □ Lot 437 □	95	5	Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input checked="" type="checkbox"/> Wire <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/>	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) _____	
5/3/19	7:18	Lot 435 □ Lot 436 □ Lot 437 □	45	5	Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input checked="" type="checkbox"/> Wire <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/>	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) _____	
5/3/19	9:28	Lot 435 □ Lot 436 □ Lot 437 □	95	5	Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input checked="" type="checkbox"/> Wire <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/>	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) _____	
5/3/19	9:51	Lot 435 □ Lot 436 □ Lot 437 □	95	5	Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input checked="" type="checkbox"/> Wire <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/>	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Other (specify) _____	

\*% of excavation or per truck load, whichever comes first

Municipal Landfill Material Tracking and Unexpected Finds

Project No.: 31E000395  
 Client Name: Hydro  
 Project Name: Buffer Zone Remediation Supervision  
 Project Site: Municipal Landfill

Comments

Date	Time	Source Reference	Soil %	Waste %	Other Findings	Comments	Unexpected Finds
5/3/19	10:05	Lot 435 Lot 436 Lot 437	95	5	<input checked="" type="checkbox"/> Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input type="checkbox"/> Fabric <input type="checkbox"/> Concrete <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> Bricks <input type="checkbox"/> Wood	Natural wood	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Drums or containers filled with product <input type="checkbox"/> Other (specify) <input type="checkbox"/>
5/3/19	10:10	Lot 435 Lot 436	95	5	<input checked="" type="checkbox"/> Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input type="checkbox"/> Fabric <input type="checkbox"/> Concrete <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> Bricks <input type="checkbox"/> Wood	Natural wood	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Drums or containers filled with product <input type="checkbox"/> Other (specify) <input type="checkbox"/>
5/3/19	2:34	Lot 435 Lot 436	85	15	<input checked="" type="checkbox"/> Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input type="checkbox"/> Fabric <input type="checkbox"/> Concrete <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> Bricks <input type="checkbox"/> Wood	Natural wood	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Drums or containers filled with product <input type="checkbox"/> Other (specify) <input type="checkbox"/>
5/3/19	2:41	Lot 435 Lot 436	90	10	<input checked="" type="checkbox"/> Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input type="checkbox"/> Fabric <input type="checkbox"/> Concrete <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> Bricks <input type="checkbox"/> Wood	Natural wood	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Drums or containers filled with product <input type="checkbox"/> Other (specify) <input type="checkbox"/>
5/3/19	3:00	Lot 435 Lot 436	90	10	<input checked="" type="checkbox"/> Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input type="checkbox"/> Fabric <input type="checkbox"/> Concrete <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> Bricks <input type="checkbox"/> Wood	Natural wood	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Drums or containers filled with product <input type="checkbox"/> Other (specify) <input type="checkbox"/>
5/3/19	3:11	Lot 435 Lot 436	90	10	<input checked="" type="checkbox"/> Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input type="checkbox"/> Fabric <input type="checkbox"/> Concrete <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> Bricks <input type="checkbox"/> Wood	Natural wood	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Drums or containers filled with product <input type="checkbox"/> Other (specify) <input type="checkbox"/>
6/3/19	8:34	Lot 435 Lot 436	98	2	<input checked="" type="checkbox"/> Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input type="checkbox"/> Fabric <input type="checkbox"/> Concrete <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> Bricks <input type="checkbox"/> Wood	contains overexcavated material from west end	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Drums or containers filled with product <input type="checkbox"/> Other (specify) <input type="checkbox"/>
6/3/19	8:50	Lot 435 Lot 436	98	2	<input checked="" type="checkbox"/> Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input type="checkbox"/> Fabric <input type="checkbox"/> Concrete <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> Bricks <input type="checkbox"/> Wood	Natural wood	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Drums or containers filled with product <input type="checkbox"/> Other (specify) <input type="checkbox"/>
6/3/19	9:07	Lot 435 Lot 436	90	10	<input checked="" type="checkbox"/> Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input type="checkbox"/> Fabric <input type="checkbox"/> Concrete <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> Bricks <input type="checkbox"/> Wood	Natural wood	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Drums or containers filled with product <input type="checkbox"/> Other (specify) <input type="checkbox"/>
6/3/19	9:23	Lot 435 Lot 436	90	10	<input checked="" type="checkbox"/> Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input type="checkbox"/> Fabric <input type="checkbox"/> Concrete <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> Bricks <input type="checkbox"/> Wood	Natural wood	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Drums or containers filled with product <input type="checkbox"/> Other (specify) <input type="checkbox"/>
6/3/19	9:45	Lot 435 Lot 436	90	10	<input checked="" type="checkbox"/> Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input type="checkbox"/> Fabric <input type="checkbox"/> Concrete <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> Bricks <input type="checkbox"/> Wood	Natural wood	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Drums or containers filled with product <input type="checkbox"/> Other (specify) <input type="checkbox"/>
6/3/19	10:00	Lot 435 Lot 436	90	10	<input checked="" type="checkbox"/> Glass bottles <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Ash <input type="checkbox"/> Fabric <input type="checkbox"/> Concrete <input type="checkbox"/> ACM Fragments <input type="checkbox"/> Large steel items (i.e. car bodies/agricultural equipment) <input type="checkbox"/> Wire <input type="checkbox"/> Paper <input type="checkbox"/> Empty 44 Gallon Drums <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> Bricks <input type="checkbox"/> Wood	Natural wood	Aluminum smelter waste (i.e. spent pot lining, anodes, refractory brick, cryolite, dross) <input type="checkbox"/> Petroleum or Other Chemical Odours <input type="checkbox"/> Unnatural Staining or Discoloration of Soil <input type="checkbox"/> Drums or containers filled with product <input type="checkbox"/> Other (specify) <input type="checkbox"/>





### Soil Sample Log

Project Name: Buffer zone remediation (municipal landfill)  
 Ramboll Personnel: J. Kirsch  
 Subcontractors: CMR, AZTECH  
 Comments:

Project No: 318000585  
 Date: 8/3/19  
 Start time: 9.30  
 Finish time: 3.30

Sample ID	Soil Description	PHD	QA ID	GPS Coordinates
ML-VAL01	SAND, fine gr, pale brown to yellow	Art 0.4	N/A	E: N:
ML-VAL02	SAND, fine gr, pale brown/orange, some grey	0.8	N/A	E: N:
ML-VAL03	As above, some natural wood (i.e. twigs)	0.8	N/A	E: N:
ML-VAL04	As above, root fibres	1.0	N/A	E: N:
ML-VAL05	SAND, pale brown, fine gr	Base 1.0	N/A	E: N:
ML-VAL06	SAND, fine gr, pale brown/grey, moist to dry	2.0	N/A	E: N:
ML-VAL07	SAND fine gr, pale brown	2.0	1/14	E: N:
ML-VAL08	SAND, pale brown/yellow, fine gr, moist	1.2	1/1	E: N:
ML-VAL09	SAND, pale brown, fine gr, roots	2.2	N/A	E: N:
ML-VAL10	Gravelly SAND, brown with grey/black mottling medium sb. ag gravel, some glass/metal	2.5	DD1	E: N:
ML-VAL11	SAND, pale br, fine gr, m- w	2.2	-	E: N:





# Soil Sample Log

Project Name: Buffer zone remediation (municipal landfill) Project No: 318000585

Ramboll Personnel: J. Kirsch Date: 8/3/19

Subcontractors: CMA, AZTECH Start time: 9:30

Comments:  Finish time: 3:30

Sample ID	Soil Description	BOM	QA ID	GPS Coordinates
VRL12	loose sandy, brown, f gr, d-m, fine sub-sandy gravel	1.5	-	E: N:
VRL13	sandy, fine gr, pale brown, nodules loose	2.3	-	E: N:
VRL14	SAND, fine gr, pale brown trace glass/metal	1.5	-	E: N:
VRL15	SAND, pale br, f-gr, loose glass/metal	1.2	-	E: N:
VRL16	SAND, brown, loose glass/metal	base	-	E: N:
VRL17	gravel, loose - m. dense, m-d SAND, pale brown, f gr	2.3.0	-	E: N:
VRL18	SAND, pale brown, m-d	base	-	E: N:
VRL19	Dark brown mud overlying sandy	base	-	E: N:

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## Soil Sample Log

Project Name: *Municipal Landfill*  
 Ramboll Personnel: *J. Kirsch*  
 Subcontractors: *CMA / AZTECH*  
 Comments:  
 Project No: *318 000585*  
 Date: *14/03/19*  
 Start time: *11.00*  
 Finish time: *2.30*

Sample ID	Soil Description	PTD mgy /	QAID	GPS Coordinates
ML-VAL19	SAND, f-gr, pale brown, with fine to med sub-ang gravel	~ 2.0	N/A.	E: -32.80156 N: 151.470325
ML-VAL20	SAND, f-gr, yellow, rootlets, loose	~ 1.2	D02-1403 701-1403	E: -32.802091 N: 151.470389
ML-VAL21	SAND, f-gr, pale brown, v-loose, some fine to medium sub-rounded gravels	~ 2.0	N/A.	E: -32.802091 N: 151.470389
ML-VAL22	SAND, f-gr, medium dense, brown/orange, rootlets. moist to dry.	~ 1.0	N/A.	E: -32.802091 N: 151.470389
ML-VAL23	SAND, f-gr, pale brown, loose, dry	~ 2.2	N/A.	E: -32.802091 N: 151.470389
ML-VAL24	SAND, f-gr, pale brown, medium dense, rootlets some medium sub-ang gravel.	1.0	N/A.	E: -32.802091 N: 151.470389
ML-VAL25	SAND, f-gr, pale brown, loose	2.3	N/A.	E: -32.802091 N: 151.470389
ML-VAL26	SAND, f-gr, pale brown, some orange, m-dense	2.5	N/A.	E: -32.802091 N: 151.470389
ML-VAL27	SAND, pale brown, loose, with fine sub-ang gravel	Base ~ 3.0m	N/A.	E: -32.802091 N: 151.470389
ML-VAL28	SAND, dense, pale brown with orange, dry	Base ~ 3.0m	N/A.	E: -32.802091 N: 151.470389

**Soil Sample Log**

Project Name: Butler zone Remediation  
 Ramboll Personnel: J. Kirsch  
 Subcontractors:  
 Comments:

Project No: 318000585  
 Date: 9/4/19  
 Start time: 9:45  
 Finish time:

Sample ID	Soil Description	PID	BOM		GPS Coordinates
			QA ID		
ML-VAL29 <sup>10/4</sup>	Silty SAND, fine gr brown/orange, with grass roots gravel + roots retained on seive.	1.5m by 1	D03_100419		E: 0356815 N: 6369630
ML-VAL30	SAND, fine to medium grained, moist, yellow, gravel and fine roots retained on seive.	N/A 0.4m by 1	N/A		E: 0356817 N: 6369619
ML-VAL31 <sup>10/4</sup>	Silty SAND, fine grained, orange/pale brown/grey fine to med s&b. retained gravel + rootlets retained.	1.6m by 1	N/A		E: 0356825 N: 6369630
ML-VAL32	SAND, fine to medium grained, dry to moist yellow gravel and leaves retained on seive.	N/A 0.1m by 1	N/A		E: 0356824 N: 6369623
ML-VAL33 <sup>10/4</sup>	SAND, fine to med gr, yellow fine to med rounded gravel + sticks retained on seive.	2m by 1	N/A		E: 0356828 N: 6369640
ML-VAL34	SAND, fine to medium grained, yellow, dry to moist gravel and rootlets retained on seive.	0.3m by 1	N/A		E: 0356836 N: 6369624
ML-VAL35 <sup>10/4</sup>	SAND, fine to med. grained, yellow, moist, sand gravel returned on seive	0.3m	N/A		E: 0356839 N: 6369652
ML-VAL36	SAND, <del>fine</del> medium grained, yellow, dry to coarse	0.34	N/A		E: 0356852 N: 6369666
ML-VAL37 <sup>10/4</sup>	Silty SAND fine to medium, brown/orange/yellow, dry to moist.	1.2m by 1	N/A		E: 0356848 N: 6369626
ML-VAL38	SAND, fine to medium grained, pale yellow/orange moist, no run retained on seive.	N/A base 0.34m by 1	N/A		E: 0356809 N: 6369622
ML-VAL39	SAND, fine to medium grained, brown with yellow, moist, gravel and some glass retained on seive	Base 0.3m by 1	N/A		E: 0356825 N: 6369626

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# Soil Sample Log

Project Name: *Burc Zone Rene Station*

Ramboll Personnel: *ML*

Subcontractors:

Comments:

Project No: *1800058*

Date: *9/4/19*

Start time:

Finish time:

BOM

PID QA ID X GPS Coordinates

Sample ID	Soil Description	PID	QA ID	X	GPS Coordinates
ML-VAL40	<i>Silty SAND, brown trace orange, med grain ed, moist</i>	<i>Base</i>	<i>D04-0964</i>	<i>X</i>	<i>E: 0356837</i>
	<i>clayels retained on sieve.</i>	<i>~ 2-3m</i>	<i>1. 702-0 of</i>	<i>X</i>	<i>N: 6369632</i>
ML-VAL41	<i>Silty SAND, brown, med to coarse grained, moist,</i>	<i>Base</i>	<i>N/A.</i>		<i>E: 0356855</i>
	<i>gravel roots and 1 terracotta fragment retained</i>	<i>2. 2-3m</i>			<i>N: 6369638</i>
					<i>E: N:</i>
					<i>E: N:</i>
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					<i>E: N:</i>

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# Soil Sample Log

Project Name: Buffer Zone Remediation  
 Ramboll Personnel: J. Backwell, J. Kirsch  
 Subcontractors:  
 Comments:

Project No: 318000585  
 Date: 10/4/19  
 Start time: 9:00  
 Finish time:

Sample ID	Soil Description	PID	QA ID	GPS Coordinates
ML-VAL42	SAND, fine to med grained, pale yellow with some gravel. Med sub-rounded gravel retained on sieve.	base ~ 2m bgl	0356875 6369680	E: 0356856 N: 6369629
ML-VAL47	SAND, fine to med grained, pale yellow	base ~ 1m bgl	0356875 6369680	E: <del>0356855</del> N: <del>6369632</del>
ML-VAL44	SAND, fine grained, pale grey. Roots and med sub-rounded gravel retained on sieve.	base ~ 1m bgl		E: 0356865 N: 6369637
ML-VAL45	SAND, coarse grained, dark brown; some gravel, fine			E: 0356848 N: 6369680
ML-VAL46	SAND, fine grained to med grained pale yellow med sub-rounded gravel retained on sieve	base ~ 1m bgl		E: 0356876 N: 6369640
ML-VAL43	SAND, fine grained, yellow	base ~ 1m bgl		E: 0356864 N: 6369675
ML-VAL48	SAND, fine grained, pale to dark grey to yellow with trace of silt streaks, roots and med sub-rounded gravel retained on sieve	base ~ 1m bgl		E: 0356893 N: 6369646
ML-VAL49	SANDY SILT, yellow/white, sand fine grained	base 0.5		E: 0356893 N: 6369642
ML-VAL50	Silty SAND, fine grained, pale brown.	base ~ 1m bgl	DOS-100419	E: 0356889 N: 6369655
ML-VAL57	SAND, medium to coarse grained, pale brown/orange with some gravel	base ~ 1.5m bgl		E: 0356929 N: 6369710
ML-VAL52	Silty SAND, fine grained pale brown	base ~ 2m bgl		E: 0356894 N: 6369659

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# Soil Sample Log

Project Name: *Buff*  
 Ramboll Personnel:  
 Subcontractors:  
 Comments:

Sample ID	Soil Description	PID	QA	GPS Coordinates
ML-VALS3	SAN M			30.6 3
ML-VALS4	SAN M			30.6 3
ML-VALS5	Clay			30.6 3
ML-VALS6	Clay SA			30.6 3
ML-VALS7	SP S1 S2 S3			30.6 3
ML-VALS8	SAN			30.6 3
ML-VALS9	SAN M			30.6 3
ML-VALS10	SAN M			30.6 3

ERTH  
 YDNEY

19/4/19  
 9:00

30.6 3  
 30.6 3  
 30.6 3

# Soil Sample Log

Project Name: Buffer Zone Supervision  
 Ramboll Personnel:  
 Subcontractors:  
 Comments:

Project No: 318000585  
 Date: 12/4/19  
 Start time:  
 Finish time:

Sample ID	Soil Description	PID	BOM	QA ID	GPS Coordinates
ML-VRL61	Silty SAND, brown, moist, with gravel/s. glass / gravel / tree roots retained on sieve.	~0.5m bgl	N/A	N/A	E: 0356993 N: 6369751
ML-VRL62	SAND, medium gr., brown/orange, moist, glass, retained on sieve (1 piece), rootlets/gravel	~0.2m bgl	N/A	N/A	E: 0356972 N: 6369742
ML-VRL63	SAND, pale brown to yellow with gravel	~4m bgl	N/A	N/A	E: 0356977 N: 6369747
ML-VRL64	Silty SAND, fine grained, light grey, with some glass (3 pieces) + roots + fine gravel	Wall ~0.5m bgl	N/A	N/A	E: 0356962 N: 6369729
ML-VRL65	Silty SAND, fine grained, grey, minor gravel on sieve + tree roots	Wall 0.5m bgl	N/A	N/A	E: 0356959 N: 6369739
ML-VRL66	Silty SAND, fine grained, grey, with some gravel & roots on sieve	Wall 0.6m bgl	N/A	N/A	E: 0356955 N: 6369721
ML-VRL67	Silty SAND, fine grained, grey, with some gravel	Wall 0.4m bgl	N/A	N/A	E: 0356948 N: 6369729
ML-VRL68	SAND, coarse grey. 2 yellow, gravel on sieve	Wall 0.3m bgl	N/A	N/A	E: 0356941 N: 6369785
ML-VRL69	Silty SAND, fine grained, grey, on sieve 1 piece flushed netfall	Wall 0.6m bgl	N/A	N/A	E: 0356929 N: 6369717
ML-VRL70	SAND, fine to med grained, with gravel on sieve	Wall 0.4m bgl	D07	D07	E: 0356932 N: 6369688
ML-VRL71	Silty SAND, fine to med grained, grey/yellow some gravel (fine) + rootlet	Wall 0.5m bgl	N/A	N/A	E: 0356916 N: 6369705

## Soil Sample Log

Project Name: <b>BUTLER ZONE SUPERVISION</b>		Project No: <b>318000585</b>		
Ramboll Personnel: <b>M. NISCH + K. GREENFIELD</b>		Date: <b>12/4/14</b>		
Subcontractors: <b>AZTECA</b>		Start time:		
Comments: <b>MUNICIPAL LANDFILL</b>		Finish time:		
		<u>BOM</u>		
Sample ID	Soil Description	PID	QA ID	GPS Coordinates
ML-VAL22	Gravelly SAND, med to coarse grained, brown with some gravel on sieve	Wall 0.5m by 1	N/A	E: 03569114 N: 6369678
ML-VAL23	SAND, coarse grained, yellow, with gravel on sieve	Wall 0.6m by 1	N/A	E: 0356904 N: 6369665
ML-VAL24	SAND, white, fine gr, moist	Base 0.6m by 1	N/A	E: 0356844 N: 6369695
				E: N:
				E: N:
				E: N:
				E: N:
				E: N:
				E: N:
				E: N:
				E: N:
				E: N:
				E: N:
				E: N:



**APPENDIX 4  
LABORATORY REPORTS**



# CHAIN OF CUSTODY

ALS Laboratory: please tick →

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Ph: 08 8359 0890 E: adelaide@alsglobal.com

BRISBANE 2 Byth Street Stafford QLD 4053  
Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

GLADSTONE 46 Callemondah Drive Clinton QLD 4680  
Ph: 07 7471 5600 E: gladstone@alsglobal.com

MACKAY 78 Harbour Road Mackay QLD 4740  
Ph: 07 4944 0177 E: mackay@alsglobal.com

MELBOURNE 2-4 Westall Road Springvale VIC 3171  
Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com

MUDGEEE 1/29 Sydney Road Mudgee NSW 2850  
Ph: 02 6372 6735 E: mudgee@mail@alsglobal.com

NEWCASTLE 5 Rose Gum Road Warabrook NSW 2304  
Ph: 02 4968 9433 E: samples.newcastle@alsglobal.com

PERTH 10 Hed Way Malaga WA 6090  
Ph: 08 9209 7655 E: samples.perth@alsglobal.com

SYDNEY 277-289 Woodpark Road Smithfield NSW 2164  
Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

TOWNSVILLE 14-15 Desma Court Bohle QLD 4818  
Ph: 07 4786 0600 E: townsville.environmental@alsglobal.com

WOLLONGONG 99 Kenny Street Wollongong NSW 2500  
Ph: 02 4225 3125 E: wollongong@alsglobal.com

UPDATED COC 15/3

CLIENT: Ramboll

OFFICE: Hunter

PROJECT: Buffer Zone Remediation - Municipal Landfill PROJECT NO 318000585

ORDER NUMBER: PURCHASE ORDER NO.: COUNTRY OF ORIGIN: Australia

PROJECT MANAGER: Kirsty Greenfield CONTACT PH: 0407 149 176

SAMPLER: Jordyn Kirsch SAMPLER MOBILE: 0421 330 255

COC Emailed to ALS? ( YES / NO) EDD FORMAT (or default):

Turnaround Requirements:  Standard TAT (List due date): 15 March 2019  
 Non Standard or urgent TAT (List due date):

FOR LABORATORY USE ONLY (Circle)  
 Custody Seal Intact? Yes No N/A  
 Free ice frozen ice bricks present upon receipt? Yes No N/A  
 Random Sample Temperature on Receipt: 64 °C  
 Other comment:

RECEIVED BY: C. Sullivan DATE/TIME: 11/3/19 9:14am  
 RECEIVED BY: C. Sullivan DATE/TIME: 11/3/19 5pm  
 RECEIVED BY: MC DATE/TIME: 11/3/19 7:30pm

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metafs are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).						Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	Soluble Fluoride	Cu, Ni, Pb, Zn	S-7	Sieving of soil to 7 mm for ACM	Bonded ACM by EA200N (0.01%)	Friable ACM by EA200N (0.01%)	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1.	ML VAL01	8/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x	
2.	ML VAL02	8/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x	
3.	ML VAL03	8/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x	
4.	ML VAL04	8/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x	
5.	ML VAL 05	8/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x	
6.	ML VAL06	8/03/19	Soil	Soil jars + bulk bags	2							
7.	ML VAL07	8/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x	
8.	ML VAL08	8/03/19	Soil	Soil jars + bulk bags	2							
9	ML VAL09	8/03/19	Soil	Soil jars + bulk bags	2							HOLD
10	ML VAL10	8/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x	HOLD
11	ML VAL11	8/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x	
12	ML VAL 12	8/03/19	Soil	Soil jars + bulk bags	2							
TOTAL												

Environmental Division  
Sydney  
Work Order Reference  
**ES1907257**



Telephone : + 61-2-8784 8555

HOLD

HOLD

HOLD

LAB OF ORIGIN:  
**NEWCASTLE**

HOLD

**E-MAILED**

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; AP - Airfreight Unpreserved Plastic  
 V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial 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; L = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.



# CHAIN OF CUSTODY

ALS Laboratory, please tick →

ADLAIDE 21 Burma Road Pooraka SA 5005  
Ph: 08 8350 0850 E: adelaide@alsglobal.com

DMACKAY 78 Harbour Road Mudgee QLD 4740  
Ph: 07 4944 0177 E: mudgee@alsglobal.com

NEWCASTLE 5 Rose Ginn Road Warabook NSW 2304  
Ph: 09 4358 9433 E: newcastle@alsglobal.com

SYDNEY 2/7-289 Woodpark Road Smithfield NSW 2164  
Ph: 02 8784 8565 E: sydney@alsglobal.com

BRISBANE 2 Bylin Street Stafford QLD 4050  
Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

MELBOURNE 2-4 Westall Road Springvale VIC 3171  
Ph: 03 8449 9000 E: samples.melbourne@alsglobal.com

TOWNSVILLE 14-15 Dasma Court Robble QLD 4818  
Ph: 07 4796 0200 E: townsville.environmental@alsglobal.com

GLADSTONE 48 Callamford Drive Cannon QLD 4680  
Ph: 07 7471 5500 E: gladstone@alsglobal.com

MUDGEE 128 Sydney Road Mudgee NSW 2650  
Ph: 02 6372 6736 E: mudgee.nsw@alsglobal.com

PERTH 10 Hod Way Malaga WA 6000  
Ph: 09 9206 7655 E: samples.perth@alsglobal.com

WOLLONGONG 90 Kenny Street Wollongong NSW 2500  
Ph: 02 4225 3125 E: wollongong@alsglobal.com

CLIENT: Ramboll		TURNAROUND REQUIREMENTS: <input type="checkbox"/> Standard TAT (List due date): (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)		<input type="checkbox"/> Non Standard or urgent TAT (List due date): 15 March 2019		FOR LABORATORY USE ONLY (Circle)	
OFFICE: Hunter		PROJECT: Buffer Zone Remediation - Municipal Landfill PROJECT NO 318000585		ALS QUOTE NO.: EN-222-18		Custody Seal Intact? Yes No N/A	
ORDER NUMBER:		PURCHASE ORDER NO.:		COC SEQUENCE NUMBER (Circle)		Free ice / frozen ice bricks present upon receipt? Yes No N/A	
PROJECT MANAGER: Kirsty Greenfield		CONTACT PH: 0407 149 176		COC: 1 2 3 4 5 6 7		Random Sample Temperature on Receipt: °C	
SAMPLER: Jordyn Kirsch		SAMPLER MOBILE: 0421 330 255		OF: 1 2 3 4 5 6 7		Other comment:	
COC Emailed to ALS? ( YES / NO)		EDD FORMAT (or default):		RECEIVED BY:		RELINQUISHED BY:	
Email Reports to (will default to PM if no other addresses are listed):		DATE/TIME:		DATE/TIME:		DATE/TIME:	
Email Invoice to (will default to PM if no other addresses are listed):						RECEIVED BY: DATE/TIME: 11/3/19 7:30 AM	
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:							

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).						Additional Information	
	LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	Soluble Fluoride	Cu, Ni, Pb, Zn	S-7	Sieving of soil to 75µm for ACM	Bonded ACM by EAC00N (0.01%)		Friable ACM by EAC00K (0.01%)
13	ML VAL13	8/03/19	Soil	Soil jars + bulk bags	2								
14	ML VAL14	8/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x		HOLD
15	ML VAL15	8/03/19	Soil	Soil jars + bulk bags	2								HOLD
16	ML VAL16	8/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x		
17	ML VAL17	8/03/19	Soil	Soil jars + bulk bags	2								HOLD
18	ML VAL18	8/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x		
19	D01_080319	8/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x		
TOTAL													

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; AP = Airfreight Unpreserved Plastic;  
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial 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; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

**EMAILED**



# CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 21 Burma Road Pooraka SA 5095  
Ph: 08 8359 0890 E: adelaide@alsglobal.com

MACKAY 78 Harbour Road Mackay QLD 4740  
Ph: 07 4944 0177 E: mackay@alsglobal.com

NEWCASTLE 5 Rose Gum Road Warabrook NSW 2304  
Ph: 02 4968 9433 E: samples.newcastle@alsglobal.com

SYDNEY 277-289 Woodpark Road Smithfield NSW 2164  
Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

BRISBANE 2 Bynh Street Stafford QLD 4053  
Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

MELBOURNE 2-4 Westall Road Springvale VIC 3171 NOWRA 4/13 Geary Place North Nowra NSW 2541  
Ph: 03 8549 9800 E: samples.melbourne@alsglobal.com Ph: 02 4423 2063 E: nowra@alsglobal.com

TOWNSVILLE 14-15 Desma Court Bohle QLD 4818  
Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com

GLADSTONE 48 Callemondah Drive Clinton QLD 4680  
Ph: 07 7471 5600 E: gladstone@alsglobal.com

MUDGEE 1/29 Sydney Road Mudgee NSW 2850  
Ph: 02 6372 6735 E: mudgee.mai@alsglobal.com

PERTH 10 Hod Way Malaga WA 6090  
Ph: 08 9209 7655 E: samples.perth@alsglobal.com

WOLLONGONG 99 Kenny Street Wollongong NSW 2500  
Ph: 02 4225 3125 E: wollongong@alsglobal.com

CLIENT: Ramboll

OFFICE: Hunter

PROJECT: Buffer Zone Remediation - Municipal Landfill PROJECT NO 318000585

ORDER NUMBER: PURCHASE ORDER NO.:

PROJECT MANAGER: Kirsty Greenfield CONTACT PH: 0407 149 176

SAMPLER: Jordyn Kirsch SAMPLER MOBILE: 0421 330 255

COC Emailed to ALS? ( YES / NO) EDD FORMAT (or default):

Email Reports to (will default to PM if no other addresses are listed):

Email Invoice to (will default to PM if no other addresses are listed):

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

TURNAROUND REQUIREMENTS :  Standard TAT (List due date):  Non Standard or urgent TAT (List due date): 15 March 2019

ALS QUOTE NO.: EN-222-18

COUNTRY OF ORIGIN: Australia

COC SEQUENCE NUMBER (Circle)

COC:	1	2	3	4	5	6	7
OF:	1	2	3	4	5	6	7

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comment:

RECEIVED BY: DATE/TIME:

RELINQUISHED BY: DATE/TIME:

RECEIVED BY: DATE/TIME: MC 11/3/19 7:56pm

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)						Additional Information	
	LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	Soluble Fluoride	Cu, Ni, Pb, Zn	S-7	Sieving of soil to 7 mm for ACM	Bonded ACM by EA200N (0.01%)		Friable ACM by EA200N (0.001%)
	ML VAL01	8/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x		Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	ML VAL02	8/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x		
	ML VAL03	8/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x		
	ML VAL04	8/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x		
	ML VAL 05	8/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x		
	ML VAL06	8/03/19	Soil	Soil jars + bulk bags	2								
	ML VAL07	8/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x	HOLD	
	ML VAL08	8/03/19	Soil	Soil jars + bulk bags	2								
	ML VAL09	8/03/19	Soil	Soil jars + bulk bags	2							HOLD	
	ML VAL10	8/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x	HOLD	
	ML VAL11	8/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x		
	ML VAL 12	8/03/19	Soil	Soil jars + bulk bags	2							HOLD	
					TOTAL								

ES1907257 Updated

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; AP - Airfreight Unpreserved Plastic

V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;

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ENFM (20/11) Form Page 1 of 1 Approved Date: 27/09/2013



# CHAIN OF CUSTODY

ALS Laboratory: please tick →

DADELAIDE 21 Burne Road Pooraka SA 5095  
Ph: 08 8359 0890 E: adelaide@alsglobal.com

BRISBANE 2 Byth Street Stafford QLD 4053  
Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

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Ph: 07 7471 5600 E: gladstone@alsglobal.com

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Ph: 07 4944 0177 E: mackay@alsglobal.com

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Ph: 02 4968 0433 E: samples.newcastle@alsglobal.com

NOWRA 4/13 Geary Place North Nowra NSW 2541  
Ph: 02 4423 2083 E: nowra@alsglobal.com

PERTH 10 Hod Way Malaga WA 6090  
Ph: 08 9209 7855 E: samples.perth@alsglobal.com

SYDNEY 277-289 Woodpark Road Smithfield NSW 2164  
Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

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Ph: 07 4786 0600 E: townsville.environmental@alsglobal.com

WOLLONGONG 99 Kenny Street Wollongong NSW 2500  
Ph: 02 4225 3125 E: wollongong@alsglobal.com

CLIENT: Ramboll		TURNAROUND REQUIREMENTS : <input type="checkbox"/> Standard TAT (List due date): (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)		<input type="checkbox"/> Non Standard or urgent TAT (List due date): 15 March 2019		FOR LABORATORY USE ONLY (Circle)				
OFFICE: Hunter		PROJECT: Buffer Zone Remediation - Municipal Landfill PROJECT NO 318000585		ALS QUOTE NO.: EN-222-18		COC SEQUENCE NUMBER (Circle)		Custody Seal Intact? Yes No N/A		Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER:		PURCHASE ORDER NO.:		COUNTRY OF ORIGIN: Australia		COC: 1 2 3 4 5 6 7		Random Sample Temperature on Receipt: °C		Other comment:
PROJECT MANAGER: Kirsty Greenfield		CONTACT PH: 0407 149 176		RELINQUISHED BY:		RECEIVED BY:		RELINQUISHED BY:		RECEIVED BY:
SAMPLER: Jordyn Kirsch		SAMPLER MOBILE: 0421 330 255		DATE/TIME:		DATE/TIME:		DATE/TIME:		DATE/TIME: 11/3/19 7:30 AM
COC Emailed to ALS? ( YES / NO)		EDD FORMAT (or default):		DATE/TIME:		DATE/TIME:		DATE/TIME:		DATE/TIME:
Email Reports to (will default to PM if no other addresses are listed):		Email Invoice to (will default to PM if no other addresses are listed):		DATE/TIME:		DATE/TIME:		DATE/TIME:		DATE/TIME:
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:										

ALS USE ONLY	SAMPLE DETAILS			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)						Additional Information	
	MATRIX: Solid(S) Water(W)	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).							
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	Soluble Fluoride	Cu, Ni, Pb, Zn	\$7	Sieving of soil to 75µm for ACM	Banded ACM by EA200N (0.01%)	Friable ACM by EA200N (0.001%)		Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	ML VAL13	8/03/19	Soil	Soil jars + bulk bags	2								
	ML VAL14	8/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x		HOLD
	ML VAL15	8/03/19	Soil	Soil jars + bulk bags	2								
	ML VAL16	8/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x		HOLD
	ML VAL17	8/03/19	Soil	Soil jars + bulk bags	2								
	ML VAL18	8/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x		HOLD
	D01_080319	8/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x		

ES1907257

## Phoung Tran

---

**From:** Chantel Sullivan  
**Sent:** Tuesday, 12 March 2019 11:08 AM  
**To:** Loren Schiavon; Phoung Tran; Fadi Soro  
**Cc:** Samples Sydney  
**Subject:** ES1907257

Hi Loren,

I have just spoken with the client, Sample 19 doesn't require testing for asbestos and therefore doesn't have the 10kg bag. Could you please remove that from the Work Order.

Yes samples 1-18 have 10kg bulk bags. I have confirmed with the lab and also the client that the earliest TAT for this one will be Friday 15/3.

Thank you!

Regards,

**Chantel Sullivan**  
Sample Receipt Officer, Newcastle  
NSW



**T** +61 2 4014 2500 **D** +61 2 4014 2500

**F** +61 2 4967 7382

[chantel.sullivan@alsglobal.com](mailto:chantel.sullivan@alsglobal.com)

5/585 Maitland Road  
Mayfield West NSW 2304

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**From:** Loren Schiavon  
**Sent:** Tuesday, March 12, 2019 10:52 AM  
**To:** Chantel Sullivan; Phoung Tran; Fadi Soro  
**Cc:** Samples Sydney; Samples Newcastle  
**Subject:** RE: ES1907257

Hi Chantel,

Environmental Division  
Sydney  
Work Order Reference  
**ES1907257**



Telephone : + 61-2-8764 8555

## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1907257</b> <b>Client</b> : <b>RAMBOLL AUSTRALIA PTY LTD</b> <b>Contact</b> : <b>KIRSTY GREENFIELD</b> <b>Address</b> : NEWCASTLE <b>Telephone</b> : +61 02 49344354 <b>Project</b> : 318000585 BUFFER ZONE REMEDIATION-MUNICIPAL LANDFILL <b>Order number</b> : 318000585 <b>C-O-C number</b> : ---- <b>Sampler</b> : J KIRSCH <b>Site</b> : ---- <b>Quote number</b> : EN/222 <b>No. of samples received</b> : 19 <b>No. of samples analysed</b> : 12	<b>Page</b> : 1 of 12 <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Sepan Mahamad <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>Telephone</b> : +61 2 8784 8555 <b>Date Samples Received</b> : 11-Mar-2019 09:14  <b>Date Analysis Commenced</b> : 12-Mar-2019 <b>Issue Date</b> : 15-Mar-2019 15:58
--	---



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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits

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

### *Signatories*

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Christopher Owler	Team Leader - Asbestos	Newcastle - Asbestos, Mayfield West, NSW
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



## General Comments

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

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

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

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

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

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

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

- EA200N: Asbestos weights and percentages are not covered under the Scope of NATA Accreditation.  
Weights of Asbestos are based on extracted bulk asbestos, fibre bundles, and/or ACM and do not include respirable fibres (if present)  
The Asbestos (Fines and Fibrous) weight is calculated from the extracted Fibrous Asbestos and Asbestos Fines as an equivalent weight of 100% Asbestos  
Percentages for Asbestos content in ACM are based on the 2013 NEPM default values.  
All calculations of percentage Asbestos under this method are approximate and should be used as a guide only.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.
- EA200N: ALS laboratory procedures and methods used for the identification and quantitation of asbestos are consistent with AS4964-2004 and the requirements of the 2013 NEPM for Assessment of Site Contamination
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR.  
Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: 'No\*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML VAL01	ML VAL02	ML VAL03	ML VAL04	ML VAL05
Client sampling date / time				08-Mar-2019 00:00	08-Mar-2019 00:00	08-Mar-2019 00:00	08-Mar-2019 00:00	08-Mar-2019 00:00	
Compound	CAS Number	LOR	Unit	ES1907257-001	ES1907257-002	ES1907257-003	ES1907257-004	ES1907257-005	
				Result	Result	Result	Result	Result	
<b>EA055: Moisture Content (Dried @ 105-110°C)</b>									
Moisture Content	----	1.0	%	1.3	3.8	7.2	6.3	4.3	
<b>EA200: AS 4964 - 2004 Identification of Asbestos in Soils</b>									
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No	
Asbestos (Trace)	1332-21-4	5	Fibres	No	No	No	No	No	
Asbestos Type	1332-21-4	-	--	-	-	-	-	-	
Sample weight (dry)	----	0.01	g	11200	11300	8400	9550	10400	
APPROVED IDENTIFIER:	----	-	--	C.OWLER	C.OWLER	C.OWLER	C.OWLER	C.OWLER	
<b>EA200N: Asbestos Quantification (non-NATA)</b>									
∅ Asbestos (Fines and Fibrous <7mm)	1332-21-4	0.0004	g	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	
∅ Asbestos (Fines and Fibrous FA+AF)	----	0.001	% (w/w)	<0.001	<0.001	<0.001	<0.001	<0.001	
∅ Asbestos Containing Material	1332-21-4	0.1	g	<0.1	<0.1	<0.1	<0.1	<0.1	
∅ Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	1332-21-4	0.01	% (w/w)	<0.01	<0.01	<0.01	<0.01	<0.01	
∅ Weight Used for % Calculation	----	0.0001	kg	11.2	11.3	8.40	9.55	10.4	
∅ Fibrous Asbestos >7mm	----	0.0004	g	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	
<b>EG005(ED093)T: Total Metals by ICP-AES</b>									
Copper	7440-50-8	5	mg/kg	<5	<5	<5	<5	<5	
Lead	7439-92-1	5	mg/kg	<5	<5	<5	<5	<5	
Nickel	7440-02-0	2	mg/kg	<2	<2	3	<2	<2	
Zinc	7440-66-6	5	mg/kg	<5	<5	6	6	57	
<b>EK040S: Fluoride Soluble</b>									
Fluoride	16984-48-8	1	mg/kg	<1	<1	<1	8	<1	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML VAL01	ML VAL02	ML VAL03	ML VAL04	ML VAL05
Client sampling date / time					08-Mar-2019 00:00	08-Mar-2019 00:00	08-Mar-2019 00:00	08-Mar-2019 00:00	08-Mar-2019 00:00
Compound	CAS Number	LOR	Unit	ES1907257-001	ES1907257-002	ES1907257-003	ES1907257-004	ES1907257-005	
				Result	Result	Result	Result	Result	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>									
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10	
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50	
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10	
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50	
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50	
<b>EP080: BTEXN</b>									
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML VAL01	ML VAL02	ML VAL03	ML VAL04	ML VAL05
Client sampling date / time				08-Mar-2019 00:00	08-Mar-2019 00:00	08-Mar-2019 00:00	08-Mar-2019 00:00	08-Mar-2019 00:00	08-Mar-2019 00:00
Compound	CAS Number	LOR	Unit	ES1907257-001	ES1907257-002	ES1907257-003	ES1907257-004	ES1907257-005	
				Result	Result	Result	Result	Result	
<b>EP080: BTEXN - Continued</b>									
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	0.5	%	75.9	73.6	76.0	71.3	74.5	
2-Chlorophenol-D4	93951-73-6	0.5	%	84.5	81.3	84.6	79.4	83.3	
2,4,6-Tribromophenol	118-79-6	0.5	%	54.7	54.9	56.5	53.8	53.2	
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	0.5	%	98.1	94.7	98.7	93.1	97.0	
Anthracene-d10	1719-06-8	0.5	%	93.6	89.3	92.7	87.9	90.9	
4-Terphenyl-d14	1718-51-0	0.5	%	83.4	80.2	84.2	79.4	83.6	
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	101	98.5	99.0	103	108	
Toluene-D8	2037-26-5	0.2	%	107	103	101	106	109	
4-Bromofluorobenzene	460-00-4	0.2	%	106	102	104	107	108	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML VAL07	ML VAL10	ML VAL11	ML VAL14	ML VAL16
Client sampling date / time				08-Mar-2019 00:00	08-Mar-2019 00:00	08-Mar-2019 00:00	08-Mar-2019 00:00	08-Mar-2019 00:00	
Compound	CAS Number	LOR	Unit	ES1907257-007	ES1907257-010	ES1907257-011	ES1907257-014	ES1907257-016	
				Result	Result	Result	Result	Result	
<b>EA055: Moisture Content (Dried @ 105-110°C)</b>									
Moisture Content	----	1.0	%	5.1	6.7	8.3	10.3	7.3	
<b>EA200: AS 4964 - 2004 Identification of Asbestos in Soils</b>									
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No	
Asbestos (Trace)	1332-21-4	5	Fibres	No	No	No	No	No	
Asbestos Type	1332-21-4	-	--	-	-	-	-	-	
Sample weight (dry)	----	0.01	g	10000	11100	11300	11900	10800	
APPROVED IDENTIFIER:	----	-	--	C.OWLER	C.OWLER	C.OWLER	C.OWLER	C.OWLER	
<b>EA200N: Asbestos Quantification (non-NATA)</b>									
∅ Asbestos (Fines and Fibrous <7mm)	1332-21-4	0.0004	g	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	
∅ Asbestos (Fines and Fibrous FA+AF)	----	0.001	% (w/w)	<0.001	<0.001	<0.001	<0.001	<0.001	
∅ Asbestos Containing Material	1332-21-4	0.1	g	<0.1	<0.1	<0.1	<0.1	<0.1	
∅ Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	1332-21-4	0.01	% (w/w)	<0.01	<0.01	<0.01	<0.01	<0.01	
∅ Weight Used for % Calculation	----	0.0001	kg	10.0	11.1	11.3	11.9	10.8	
∅ Fibrous Asbestos >7mm	----	0.0004	g	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	
<b>EG005(ED093)T: Total Metals by ICP-AES</b>									
Copper	7440-50-8	5	mg/kg	<5	<5	<5	<5	<5	
Lead	7439-92-1	5	mg/kg	<5	<5	18	<5	18	
Nickel	7440-02-0	2	mg/kg	<2	2	<2	2	3	
Zinc	7440-66-6	5	mg/kg	<5	10	31	<5	47	
<b>EK040S: Fluoride Soluble</b>									
Fluoride	16984-48-8	1	mg/kg	<1	<1	8	<1	11	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML VAL07	ML VAL10	ML VAL11	ML VAL14	ML VAL16
Client sampling date / time					08-Mar-2019 00:00	08-Mar-2019 00:00	08-Mar-2019 00:00	08-Mar-2019 00:00	08-Mar-2019 00:00
Compound	CAS Number	LOR	Unit	ES1907257-007	ES1907257-010	ES1907257-011	ES1907257-014	ES1907257-016	
				Result	Result	Result	Result	Result	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>									
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10	
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50	
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10	
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50	
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50	
<b>EP080: BTEXN</b>									
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML VAL07	ML VAL10	ML VAL11	ML VAL14	ML VAL16
Client sampling date / time				08-Mar-2019 00:00	08-Mar-2019 00:00	08-Mar-2019 00:00	08-Mar-2019 00:00	08-Mar-2019 00:00	
Compound	CAS Number	LOR	Unit	ES1907257-007	ES1907257-010	ES1907257-011	ES1907257-014	ES1907257-016	
				Result	Result	Result	Result	Result	
<b>EP080: BTEXN - Continued</b>									
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	0.5	%	72.6	72.2	71.7	71.1	74.0	
2-Chlorophenol-D4	93951-73-6	0.5	%	80.5	80.5	79.4	78.9	82.6	
2,4,6-Tribromophenol	118-79-6	0.5	%	51.7	52.3	51.6	48.9	52.1	
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	0.5	%	93.9	93.3	92.7	92.1	96.2	
Anthracene-d10	1719-06-8	0.5	%	88.3	88.4	88.4	87.5	89.9	
4-Terphenyl-d14	1718-51-0	0.5	%	80.5	80.3	80.4	80.3	83.2	
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	101	103	103	95.0	101	
Toluene-D8	2037-26-5	0.2	%	104	108	106	97.8	107	
4-Bromofluorobenzene	460-00-4	0.2	%	105	107	106	98.0	106	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID		ML VAL18	D01_080319	----	----	----
Client sampling date / time				08-Mar-2019 00:00	08-Mar-2019 00:00	----	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1907257-018	ES1907257-019	-----	-----	-----	-----	-----
				Result	Result	----	----	----	----	----
<b>EA055: Moisture Content (Dried @ 105-110°C)</b>										
Moisture Content	----	1.0	%	9.3	7.7	----	----	----	----	----
<b>EA200: AS 4964 - 2004 Identification of Asbestos in Soils</b>										
Asbestos Detected	1332-21-4	0.1	g/kg	No	----	----	----	----	----	----
Asbestos (Trace)	1332-21-4	5	Fibres	No	----	----	----	----	----	----
Asbestos Type	1332-21-4	-	--	-	----	----	----	----	----	----
Sample weight (dry)	----	0.01	g	12900	----	----	----	----	----	----
APPROVED IDENTIFIER:	----	-	--	C.OWLER	----	----	----	----	----	----
<b>EA200N: Asbestos Quantification (non-NATA)</b>										
∅ Asbestos (Fines and Fibrous <7mm)	1332-21-4	0.0004	g	<0.0004	----	----	----	----	----	----
∅ Asbestos (Fines and Fibrous FA+AF)	----	0.001	% (w/w)	<0.001	----	----	----	----	----	----
∅ Asbestos Containing Material	1332-21-4	0.1	g	<0.1	----	----	----	----	----	----
∅ Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	1332-21-4	0.01	% (w/w)	<0.01	----	----	----	----	----	----
∅ Weight Used for % Calculation	----	0.0001	kg	12.9	----	----	----	----	----	----
∅ Fibrous Asbestos >7mm	----	0.0004	g	<0.0004	----	----	----	----	----	----
<b>EG005(ED093)T: Total Metals by ICP-AES</b>										
Copper	7440-50-8	5	mg/kg	<5	<5	----	----	----	----	----
Lead	7439-92-1	5	mg/kg	6	<5	----	----	----	----	----
Nickel	7440-02-0	2	mg/kg	2	3	----	----	----	----	----
Zinc	7440-66-6	5	mg/kg	83	26	----	----	----	----	----
<b>EK040S: Fluoride Soluble</b>										
Fluoride	16984-48-8	1	mg/kg	5	3	----	----	----	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>										
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	----	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	----	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	----	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	----	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	----	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	----	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	----	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	----	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	----	----	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML VAL18	D01_080319	----	----	----
Client sampling date / time				08-Mar-2019 00:00	08-Mar-2019 00:00	----	----	----	
Compound	CAS Number	LOR	Unit	ES1907257-018	ES1907257-019	-----	-----	-----	
				Result	Result	----	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>									
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	----	----	----	
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	----	----	----	
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	----	----	----	
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	----	----	----	
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	----	----	
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	----	----	----	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	----	----	----	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	----	----	----	
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	----	----	----	
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	----	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	----	10	mg/kg	<10	<10	----	----	----	
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	----	----	
C15 - C28 Fraction	----	100	mg/kg	<100	<100	----	----	----	
C29 - C36 Fraction	----	100	mg/kg	<100	<100	----	----	----	
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	----	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	----	----	----	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	----	----	----	
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	----	----	----	
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	----	----	----	
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	----	----	----	
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	----	----	----	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	----	----	----	
<b>EP080: BTEXN</b>									
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	----	----	
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	----	----	----	
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	----	----	----	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	----	----	----	
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	----	----	----	
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	----	----	----	
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	----	----	----	
Naphthalene	91-20-3	1	mg/kg	<1	<1	----	----	----	





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML VAL18	D01_080319	----	----	----
Client sampling date / time				08-Mar-2019 00:00	08-Mar-2019 00:00	----	----	----	
Compound	CAS Number	LOR	Unit	ES1907257-018	ES1907257-019	-----	-----	-----	
				Result	Result	----	----	----	
<b>EP080: BTEXN - Continued</b>									
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	0.5	%	72.9	73.3	----	----	----	
2-Chlorophenol-D4	93951-73-6	0.5	%	81.2	81.4	----	----	----	
2,4,6-Tribromophenol	118-79-6	0.5	%	49.3	49.5	----	----	----	
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	0.5	%	96.2	96.1	----	----	----	
Anthracene-d10	1719-06-8	0.5	%	90.4	90.1	----	----	----	
4-Terphenyl-d14	1718-51-0	0.5	%	84.6	84.0	----	----	----	
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	103	101	----	----	----	
Toluene-D8	2037-26-5	0.2	%	103	103	----	----	----	
4-Bromofluorobenzene	460-00-4	0.2	%	103	104	----	----	----	

## Analytical Results

### Descriptive Results

Sub-Matrix: SOIL

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
<b>EA200: AS 4964 - 2004 Identification of Asbestos in Soils</b>		
EA200: Description	ML VAL01 - 08-Mar-2019 00:00	Mid brown soil.
EA200: Description	ML VAL02 - 08-Mar-2019 00:00	Mid brown soil.
EA200: Description	ML VAL03 - 08-Mar-2019 00:00	Mid brown soil.
EA200: Description	ML VAL04 - 08-Mar-2019 00:00	Mid brown soil.
EA200: Description	ML VAL05 - 08-Mar-2019 00:00	Mid brown soil.
EA200: Description	ML VAL07 - 08-Mar-2019 00:00	Mid brown soil.
EA200: Description	ML VAL10 - 08-Mar-2019 00:00	Mid brown soil.
EA200: Description	ML VAL11 - 08-Mar-2019 00:00	Mid brown soil.
EA200: Description	ML VAL14 - 08-Mar-2019 00:00	Mid brown soil.
EA200: Description	ML VAL16 - 08-Mar-2019 00:00	Mid brown soil.
EA200: Description	ML VAL18 - 08-Mar-2019 00:00	Mid brown soil.



## Surrogate Control Limits

Sub-Matrix: 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

<b>Work Order</b>	: <b>ES1907257</b>	Page	: 1 of 7
<b>Client</b>	: <b>RAMBOLL AUSTRALIA PTY LTD</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: <b>KIRSTY GREENFIELD</b>	<b>Contact</b>	: Sepan Mahamad
<b>Address</b>	: NEWCASTLE	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>Telephone</b>	: +61 02 49344354	<b>Telephone</b>	: +61 2 8784 8555
<b>Project</b>	: 318000585 BUFFER ZONE REMEDIATION-MUNICIPAL LANDFILL	<b>Date Samples Received</b>	: 11-Mar-2019
<b>Order number</b>	: 318000585	<b>Date Analysis Commenced</b>	: 12-Mar-2019
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 15-Mar-2019
<b>Sampler</b>	: J KIRSCH		
<b>Site</b>	: ----		
<b>Quote number</b>	: EN/222		
<b>No. of samples received</b>	: 19		
<b>No. of samples analysed</b>	: 12		



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

This Quality Control Report contains the following information:

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

### Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Christopher Owler	Team Leader - Asbestos	Newcastle - Asbestos, Mayfield West, NSW
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



## General Comments

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

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

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

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

## Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 2228797)</b>									
ES1907257-016	ML VAL16	EG005T: Nickel	7440-02-0	2	mg/kg	3	2	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	18	13	35.8	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	47	42	10.3	No Limit
ES1907125-001	Anonymous	EG005T: Nickel	7440-02-0	2	mg/kg	35	37	6.69	0% - 50%
		EG005T: Copper	7440-50-8	5	mg/kg	22	26	16.6	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	14	23	48.5	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	67	75	11.4	0% - 50%
<b>EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2229925)</b>									
ES1907125-001	Anonymous	EA055: Moisture Content	----	0.1	%	7.6	7.4	3.67	No Limit
ES1907257-016	ML VAL16	EA055: Moisture Content	----	0.1	%	7.3	7.7	5.99	No Limit
<b>EK040S: Fluoride Soluble (QC Lot: 2228792)</b>									
ES1907257-001	ML VAL01	EK040S: Fluoride	16984-48-8	1	mg/kg	<1	<1	0.00	No Limit
ES1907257-016	ML VAL16	EK040S: Fluoride	16984-48-8	1	mg/kg	11	11	0.00	0% - 50%
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2228351)</b>									
ES1907257-001	ML VAL01	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit



Sub-Matrix: 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)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2228351) - continued</b>									
ES1907257-001	ML VAL01	EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1907257-018	ML VAL18	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2228352)</b>							
ES1907257-001	ML VAL01	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1907257-018	ML VAL18	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2228712)</b>									
ES1907257-001	ML VAL01	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit

Page : 4 of 7  
 Work Order : ES1907257  
 Client : RAMBOLL AUSTRALIA PTY LTD  
 Project : 318000585 BUFFER ZONE REMEDIATION-MUNICIPAL LANDFILL



Sub-Matrix: **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>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2228712) - continued</b>									
ES1907257-018	ML VAL18	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2228352)</b>									
ES1907257-001	ML VAL01	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1907257-018	ML VAL18	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2228712)</b>									
ES1907257-001	ML VAL01	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1907257-018	ML VAL18	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
<b>EP080: BTEXN (QC Lot: 2228712)</b>									
ES1907257-001	ML VAL01	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
ES1907257-018	ML VAL18	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit



## Method Blank (MB) and Laboratory Control Spike (LCS) Report

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

Sub-Matrix: SOIL

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
					Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)
Method: Compound	CAS Number	LOR	Unit					LCS	Low
<b>EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2228797)</b>									
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	110	86	120	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	108	80	114	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	104	87	123	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	110	80	122	
<b>EK040S: Fluoride Soluble (QCLot: 2228792)</b>									
EK040S: Fluoride	16984-48-8	1	mg/kg	<1	25 mg/kg	92.4	69	117	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2228351)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	107	77	125	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	117	72	124	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	114	73	127	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	115	72	126	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	121	75	127	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	122	77	127	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	126	73	127	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	121	74	128	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	107	69	123	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	107	75	127	
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	95.1	68	116	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	108	74	126	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	115	70	126	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	70.7	61	121	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	72.7	62	118	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	66.5	63	121	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2228352)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	107	75	129	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	111	77	131	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	103	71	129	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2228712)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	92.5	68	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2228352)</b>									
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	108	77	125	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	109	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	84.2	63	131	



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit		Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2228712)</b>								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	97.0	68	128
<b>EP080: BTEXN (QCLot: 2228712)</b>								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	99.4	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	99.3	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	104	65	117
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	104	66	118
	106-42-3							
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	107	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	101	63	119

### Matrix Spike (MS) Report

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

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%) Low	High
<b>EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2228797)</b>							
ES1907125-001	Anonymous	EG005T: Copper	7440-50-8	250 mg/kg	98.7	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	101	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	79.2	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	102	70	130
<b>EK040S: Fluoride Soluble (QCLot: 2228792)</b>							
ES1907257-001	ML VAL01	EK040S: Fluoride	16984-48-8	25 mg/kg	92.8	70	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2228351)</b>							
ES1907257-001	ML VAL01	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	104	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	124	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2228352)</b>							
ES1907257-001	ML VAL01	EP071: C10 - C14 Fraction	----	523 mg/kg	100	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	118	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	118	52	132
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2228712)</b>							
ES1907257-001	ML VAL01	EP080: C6 - C9 Fraction	----	32.5 mg/kg	113	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2228352)</b>							
ES1907257-001	ML VAL01	EP071: >C10 - C16 Fraction	----	860 mg/kg	102	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	124	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	117	52	132



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 Work Order : ES1907257  
 Client : RAMBOLL AUSTRALIA PTY LTD  
 Project : 318000585 BUFFER ZONE REMEDIATION-MUNICIPAL LANDFILL



Sub-Matrix: **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: 2228712)</b>								
ES1907257-001	ML VAL01	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	113	70	130	
<b>EP080: BTEXN (QCLot: 2228712)</b>								
ES1907257-001	ML VAL01	EP080: Benzene	71-43-2	2.5 mg/kg	102	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	100	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	102	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	102	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	100	70	130	
	EP080: Naphthalene	91-20-3	2.5 mg/kg	95.3	70	130		

## QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES1907257	Page	: 1 of 6
Client	: RAMBOLL AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: KIRSTY GREENFIELD	Telephone	: +61 2 8784 8555
Project	: 318000585 BUFFER ZONE REMEDIATION-MUNICIPAL LANDFILL	Date Samples Received	: 11-Mar-2019
Site	: ---	Issue Date	: 15-Mar-2019
Sampler	: J KIRSCH	No. of samples received	: 19
Order number	: 318000585	No. of samples analysed	: 12

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

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

#### Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

#### Outliers : Frequency of Quality Control Samples

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



## Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EA055: Moisture Content (Dried @ 105-110°C)</b>							
<b>Soil Glass Jar - Unpreserved (EA055)</b>							
ML VAL01, ML VAL03, ML VAL05, ML VAL10, ML VAL14, ML VAL18, ML VAL02, ML VAL04, ML VAL07, ML VAL11, ML VAL16, D01_080319	08-Mar-2019	----	----	----	12-Mar-2019	22-Mar-2019	✓
<b>EA200: AS 4964 - 2004 Identification of Asbestos in Soils</b>							
<b>Snap Lock Bag (EA200)</b>							
ML VAL01, ML VAL03, ML VAL05, ML VAL10, ML VAL14, ML VAL18, ML VAL02, ML VAL04, ML VAL07, ML VAL11, ML VAL16,	08-Mar-2019	----	----	----	12-Mar-2019	04-Sep-2019	✓
<b>EA200N: Asbestos Quantification (non-NATA)</b>							
<b>Snap Lock Bag (EA200N)</b>							
ML VAL01, ML VAL03, ML VAL05, ML VAL10, ML VAL14, ML VAL18, ML VAL02, ML VAL04, ML VAL07, ML VAL11, ML VAL16,	08-Mar-2019	----	----	----	12-Mar-2019	04-Sep-2019	✓
<b>EG005(ED093)T: Total Metals by ICP-AES</b>							
<b>Soil Glass Jar - Unpreserved (EG005T)</b>							
ML VAL01, ML VAL03, ML VAL05, ML VAL10, ML VAL14, ML VAL18, ML VAL02, ML VAL04, ML VAL07, ML VAL11, ML VAL16, D01_080319	08-Mar-2019	12-Mar-2019	04-Sep-2019	✓	12-Mar-2019	04-Sep-2019	✓



Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EK040S: Fluoride Soluble</b>								
<b>Soil Glass Jar - Unpreserved (EK040S)</b>								
ML VAL01, ML VAL03, ML VAL05, ML VAL10, ML VAL14, ML VAL18, ML VAL02, ML VAL04, ML VAL07, ML VAL11, ML VAL16, D01_080319	08-Mar-2019	12-Mar-2019	15-Mar-2019	✓	12-Mar-2019	09-Apr-2019	✓	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b>								
ML VAL01, ML VAL03, ML VAL05, ML VAL10, ML VAL14, ML VAL18, ML VAL02, ML VAL04, ML VAL07, ML VAL11, ML VAL16, D01_080319	08-Mar-2019	12-Mar-2019	22-Mar-2019	✓	14-Mar-2019	21-Apr-2019	✓	
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b>								
ML VAL01, ML VAL03, ML VAL05, ML VAL10, ML VAL14, ML VAL18, ML VAL02, ML VAL04, ML VAL07, ML VAL11, ML VAL16, D01_080319	08-Mar-2019	12-Mar-2019	22-Mar-2019	✓	14-Mar-2019	22-Mar-2019	✓	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b>								
ML VAL01, ML VAL03, ML VAL05, ML VAL10, ML VAL14, ML VAL18, ML VAL02, ML VAL04, ML VAL07, ML VAL11, ML VAL16, D01_080319	08-Mar-2019	12-Mar-2019	22-Mar-2019	✓	14-Mar-2019	22-Mar-2019	✓	
<b>EP080: BTEXN</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b>								
ML VAL01, ML VAL03, ML VAL05, ML VAL10, ML VAL14, ML VAL18, ML VAL02, ML VAL04, ML VAL07, ML VAL11, ML VAL16, D01_080319	08-Mar-2019	12-Mar-2019	22-Mar-2019	✓	14-Mar-2019	22-Mar-2019	✓	



## Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Reaular	Actual	Expected	Evaluation	
<b>Laboratory Duplicates (DUP)</b>							
Fluoride - Soluble	EK040S	2	12	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	13	15.38	10.00	✓	NEPM 2013 B3 & ALS QC Standard
<b>Laboratory Control Samples (LCS)</b>							
Fluoride - Soluble	EK040S	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
<b>Method Blanks (MB)</b>							
Fluoride - Soluble	EK040S	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
<b>Matrix Spikes (MS)</b>							
Fluoride - Soluble	EK040S	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard



## Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Asbestos Identification in Soils	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Asbestos Classification and Quantitation per NEPM 2013	* EA200N	SOIL	Asbestos Classification and Quantitation per NEPM 2013 with Confirmation of Identification by AS 4964 - 2004 Gravimetric determination of Asbestos Containing Material, Fibrous Asbestos, Asbestos Fines and sample weight and calculation of percentage concentrations per NEPM protocols. Asbestos (Fines and Fibrous FA+AF) is reported as the equivalent weight in the sample received after accounting for sub-sampling (where applicable for the <7mm and/or <2mm fractions).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Fluoride - Soluble	EK040S	SOIL	In house: Referenced to APHA 4500 F--C Soluble Fluoride is determined after a 1:5 soil/water extract using an ion selective electrode.
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM amended 2013.

Preparation Methods	Method	Matrix	Method Descriptions
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.





# CHAIN OF CUSTODY

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CLIENT: Ramboll

OFFICE: Hunter

PROJECT: Buffer Zone Remediation - Municipal Landfill PROJECT NO 31800585

ORDER NUMBER: PURCHASE ORDER NO.:

PROJECT MANAGER: Kirsty Greenfield CONTACT PH: 0407 149 176

SAMPLER: Jordyn Kirsch SAMPLER MOBILE: 0421 330 255

COC Emailed to ALS? ( YES / NO ) EDD FORMAT (or default):

Email Reports to (will default to PM if no other addresses are listed):

Email Invoice to (will default to PM if no other addresses are listed):

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

TURNAROUND REQUIREMENTS :  
(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)

Standard TAT (List due date):  
 Non Standard or urgent TAT (List due date): 22 March 2019

ALS QUOTE NO.: EN-222-18

COUNTRY OF ORIGIN: Australia

RELINQUISHED BY: *[Signature]*

DATE/TIME: 14/3/19 4:23pm

RECEIVED BY: *[Signature]*

DATE/TIME: 14/03/19 4:23pm

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No  
Free Ice / Frozen Ice bricks present upon receipt? Yes No  
Random Sample Temperature on Receipt: 3-1 °C  
Other comment:

RECEIVED BY: *[Signature]*

DATE/TIME: 14/3/19 19:38

Environmental Division  
Sydney  
Work Order Reference  
**ES1907782**



Telephone: +61-2-8784 8555

LAB OF ORIGIN:  
NEWCASTLE

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract)					
						Soluble Fluoride	Cu, Ni, Pb, Zn	S-7	Steving of soil to 7 mm for ACM	Bonded ACM by EA200N (0.01%)	Friable ACM by EA200N (0.001%)
1	ML VAL19	14/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x
2	ML VAL20	14/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x
3	ML VAL21	14/03/19	Soil	Soil jars + bulk bags	2						
4	ML VAL22	14/03/19	Soil	Soil jars + bulk bags	2						
5	ML VAL23	14/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x
6	ML VAL24	14/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x
7	ML VAL25	14/03/19	Soil	Soil jars + bulk bags	2						
8	ML VAL26	14/03/19	Soil	Soil jars + bulk bags	2						
9	ML VAL27	14/03/19	Soil	Soil jars + bulk bags	2						
10	ML VAL28	14/03/19	Soil	Soil jars + bulk bags	2	x	x	x	x	x	x
11	D02_140319	14/03/19	Soil	Soil jars + bulk bags	1	x	x	x	x	x	x
12	T01_140319	14/03/19	Soil	Soil jars + bulk bags	1	x	x	x			
TOTAL					22						

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; AP = Airfreight Unpreserved Plastic  
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial 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; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.



## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1907782</b> <b>Client</b> : <b>RAMBOLL AUSTRALIA PTY LTD</b> <b>Contact</b> : <b>KIRSTY GREENFIELD</b> <b>Address</b> : NEWCASTLE <b>Telephone</b> : +61 02 49344354 <b>Project</b> : 31800585 BUFFER ZONE REMEDIATION-MUNICIPAL LANDFILL <b>Order number</b> : <b>C-O-C number</b> : ---- <b>Sampler</b> : J KIRSCH <b>Site</b> : ---- <b>Quote number</b> : EN/222 <b>No. of samples received</b> : 12 <b>No. of samples analysed</b> : 7	<b>Page</b> : 1 of 9 <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Sepan Mahamad <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>Telephone</b> : +61 2 8784 8555 <b>Date Samples Received</b> : 14-Mar-2019 16:24  <b>Date Analysis Commenced</b> : 15-Mar-2019 <b>Issue Date</b> : 22-Mar-2019 13:09
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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits

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

### *Signatories*

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Christopher Owler	Team Leader - Asbestos	Newcastle - Asbestos, Mayfield West, NSW
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



## General Comments

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

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

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

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

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

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

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

- EK040S: LOR raised for Fluoride due to sample matrix.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero
- 10L samples supplied for asbestos analysis have been sieved as per NEPM field sieving instructions.
- EA200N: Asbestos weights and percentages are not covered under the Scope of NATA Accreditation.  
Weights of Asbestos are based on extracted bulk asbestos, fibre bundles, and/or ACM and do not include respirable fibres (if present)  
The Asbestos (Fines and Fibrous) weight is calculated from the extracted Fibrous Asbestos and Asbestos Fines as an equivalent weight of 100% Asbestos  
Percentages for Asbestos content in ACM are based on the 2013 NEPM default values.  
All calculations of percentage Asbestos under this method are approximate and should be used as a guide only.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.
- EA200N: ALS laboratory procedures and methods used for the identification and quantitation of asbestos are consistent with AS4964-2004 and the requirements of the 2013 NEPM for Assessment of Site Contamination
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: 'No\*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML VAL19	ML VAL20	ML VAL23	ML VAL24	ML VAL28
Client sampling date / time					14-Mar-2019 00:00	14-Mar-2019 00:00	14-Mar-2019 00:00	14-Mar-2019 00:00	14-Mar-2019 00:00
Compound	CAS Number	LOR	Unit	ES1907782-001	ES1907782-002	ES1907782-005	ES1907782-006	ES1907782-010	
				Result	Result	Result	Result	Result	
<b>EA055: Moisture Content (Dried @ 105-110°C)</b>									
Moisture Content	----	1.0	%	3.3	8.4	3.1	3.2	1.8	
<b>EA200: AS 4964 - 2004 Identification of Asbestos in Soils</b>									
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No	
Asbestos (Trace)	1332-21-4	5	Fibres	No	No	No	No	No	
Asbestos Type	1332-21-4	-	--	-	-	-	-	-	
Sample weight (dry)	----	0.01	g	12000	14300	12900	11400	10400	
APPROVED IDENTIFIER:	----	-	--	C.OWLER	C.OWLER	C.OWLER	C.OWLER	C.OWLER	
<b>EA200N: Asbestos Quantification (non-NATA)</b>									
∅ Asbestos (Fines and Fibrous <7mm)	1332-21-4	0.0004	g	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	
∅ Asbestos (Fines and Fibrous FA+AF)	----	0.001	% (w/w)	<0.001	<0.001	<0.001	<0.001	<0.001	
∅ Asbestos Containing Material	1332-21-4	0.1	g	<0.1	<0.1	<0.1	<0.1	<0.1	
∅ Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	1332-21-4	0.01	% (w/w)	<0.01	<0.01	<0.01	<0.01	<0.01	
∅ Weight Used for % Calculation	----	0.0001	kg	12.0	14.3	12.9	11.4	10.4	
∅ Fibrous Asbestos >7mm	----	0.0004	g	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	
<b>EG005(ED093)T: Total Metals by ICP-AES</b>									
Copper	7440-50-8	5	mg/kg	<5	<5	<5	<5	<5	
Lead	7439-92-1	5	mg/kg	46	<5	<5	<5	<5	
Nickel	7440-02-0	2	mg/kg	2	<2	2	<2	3	
Zinc	7440-66-6	5	mg/kg	16	<5	<5	<5	96	
<b>EK040S: Fluoride Soluble</b>									
Fluoride	16984-48-8	1	mg/kg	<5	<5	<5	<5	<5	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML VAL19	ML VAL20	ML VAL23	ML VAL24	ML VAL28
Client sampling date / time					14-Mar-2019 00:00	14-Mar-2019 00:00	14-Mar-2019 00:00	14-Mar-2019 00:00	14-Mar-2019 00:00
Compound	CAS Number	LOR	Unit	ES1907782-001	ES1907782-002	ES1907782-005	ES1907782-006	ES1907782-010	
				Result	Result	Result	Result	Result	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>									
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10	
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50	
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10	
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50	
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50	
<b>EP080: BTEXN</b>									
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML VAL19	ML VAL20	ML VAL23	ML VAL24	ML VAL28
Client sampling date / time					14-Mar-2019 00:00	14-Mar-2019 00:00	14-Mar-2019 00:00	14-Mar-2019 00:00	14-Mar-2019 00:00
Compound	CAS Number	LOR	Unit	ES1907782-001	ES1907782-002	ES1907782-005	ES1907782-006	ES1907782-010	
				Result	Result	Result	Result	Result	
<b>EP080: BTEXN - Continued</b>									
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	0.5	%	70.8	73.7	67.8	74.6	71.6	
2-Chlorophenol-D4	93951-73-6	0.5	%	77.5	79.8	74.6	80.2	77.5	
2,4,6-Tribromophenol	118-79-6	0.5	%	33.7	34.3	28.7	32.2	31.8	
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	0.5	%	86.9	89.0	83.7	90.6	87.2	
Anthracene-d10	1719-06-8	0.5	%	82.9	83.8	79.7	85.1	82.6	
4-Terphenyl-d14	1718-51-0	0.5	%	79.0	79.2	77.3	80.9	80.0	
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	104	108	110	112	110	
Toluene-D8	2037-26-5	0.2	%	100	101	104	104	99.7	
4-Bromofluorobenzene	460-00-4	0.2	%	100	101	98.2	102	93.9	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		Client sample ID			D02_140319	T01_140319	----	----	----
		Client sampling date / time			14-Mar-2019 00:00	14-Mar-2019 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES1907782-011	ES1907782-012	-----	-----	-----	
				Result	Result	----	----	----	
<b>EA055: Moisture Content (Dried @ 105-110°C)</b>									
Moisture Content	----	1.0	%	4.5	3.8	----	----	----	
<b>EG005(ED093)T: Total Metals by ICP-AES</b>									
Copper	7440-50-8	5	mg/kg	<5	<5	----	----	----	
Lead	7439-92-1	5	mg/kg	<5	<5	----	----	----	
Nickel	7440-02-0	2	mg/kg	<2	<2	----	----	----	
Zinc	7440-66-6	5	mg/kg	<5	<5	----	----	----	
<b>EK040S: Fluoride Soluble</b>									
Fluoride	16984-48-8	1	mg/kg	<5	<5	----	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	----	----	----	
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	----	----	----	
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	----	----	----	
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	----	----	
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	----	----	----	
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	----	----	----	
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	----	----	----	
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	----	----	----	
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	----	----	----	
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	----	----	----	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	----	----	----	
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	----	----	----	
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	----	----	----	
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	----	----	----	
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	----	----	
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	----	----	----	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	----	----	----	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	----	----	----	
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	----	----	----	
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	----	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	----	10	mg/kg	<10	<10	----	----	----	
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	----	----	
C15 - C28 Fraction	----	100	mg/kg	<100	<100	----	----	----	
C29 - C36 Fraction	----	100	mg/kg	<100	<100	----	----	----	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	D02_140319	T01_140319	----	----	----
Client sampling date / time				14-Mar-2019 00:00	14-Mar-2019 00:00	----	----	----	
Compound	CAS Number	LOR	Unit	ES1907782-011	ES1907782-012	-----	-----	-----	
				Result	Result	----	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons - Continued</b>									
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	----	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	----	----	----	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	----	----	----	
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	----	----	----	
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	----	----	----	
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	----	----	----	
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	----	----	----	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	----	----	----	
<b>EP080: BTEXN</b>									
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	----	----	
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	----	----	----	
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	----	----	----	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	----	----	----	
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	----	----	----	
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	----	----	----	
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	----	----	----	
Naphthalene	91-20-3	1	mg/kg	<1	<1	----	----	----	
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	0.5	%	70.4	73.5	----	----	----	
2-Chlorophenol-D4	93951-73-6	0.5	%	76.1	79.8	----	----	----	
2,4,6-Tribromophenol	118-79-6	0.5	%	29.9	40.1	----	----	----	
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	0.5	%	85.8	90.1	----	----	----	
Anthracene-d10	1719-06-8	0.5	%	81.0	92.6	----	----	----	
4-Terphenyl-d14	1718-51-0	0.5	%	77.9	88.8	----	----	----	
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	115	108	----	----	----	
Toluene-D8	2037-26-5	0.2	%	105	100	----	----	----	
4-Bromofluorobenzene	460-00-4	0.2	%	103	96.8	----	----	----	



## Analytical Results

### Descriptive Results

Sub-Matrix: **SOIL**

<i>Method: Compound</i>	<i>Client sample ID - Client sampling date / time</i>	<i>Analytical Results</i>
<b>EA200: AS 4964 - 2004 Identification of Asbestos in Soils</b>		
EA200: Description	ML VAL19 - 14-Mar-2019 00:00	Mld brown soil.
EA200: Description	ML VAL20 - 14-Mar-2019 00:00	Mld brown soil.
EA200: Description	ML VAL23 - 14-Mar-2019 00:00	Mld brown soil.
EA200: Description	ML VAL24 - 14-Mar-2019 00:00	Mld brown soil.
EA200: Description	ML VAL28 - 14-Mar-2019 00:00	Mld brown soil.





## Surrogate Control Limits

Sub-Matrix: 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

<b>Work Order</b>	: <b>ES1907782</b>	<b>Page</b>	: 1 of 6
<b>Client</b>	: <b>RAMBOLL AUSTRALIA PTY LTD</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: <b>KIRSTY GREENFIELD</b>	<b>Contact</b>	: Sepan Mahamad
<b>Address</b>	:	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
	NEWCASTLE		
<b>Telephone</b>	: +61 02 49344354	<b>Telephone</b>	: +61 2 8784 8555
<b>Project</b>	: 31800585 BUFFER ZONE REMEDIATION-MUNICIPAL LANDFILL	<b>Date Samples Received</b>	: 14-Mar-2019
<b>Order number</b>	:	<b>Date Analysis Commenced</b>	: 15-Mar-2019
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 22-Mar-2019
<b>Sampler</b>	: J KIRSCH		
<b>Site</b>	: ----		
<b>Quote number</b>	: EN/222		
<b>No. of samples received</b>	: 12		
<b>No. of samples analysed</b>	: 7		



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

This Quality Control Report contains the following information:

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

### Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Christopher Owler	Team Leader - Asbestos	Newcastle - Asbestos, Mayfield West, NSW
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



## General Comments

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

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

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

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

## Laboratory Duplicate (DUP) Report

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

Sub-Matrix: SOIL

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 2240259)</b>									
ES1907763-003	Anonymous	EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	7	6	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	9	5	52.0	No Limit
ES1908061-001	Anonymous	EG005T: Nickel	7440-02-0	2	mg/kg	16	16	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	68	64	5.65	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	22	20	9.05	No Limit
<b>EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2239125)</b>									
ES1907763-006	Anonymous	EA055: Moisture Content	----	0.1	%	12.3	11.9	3.26	0% - 50%
ES1907791-002	Anonymous	EA055: Moisture Content	----	0.1	%	7.6	8.0	5.24	No Limit
<b>EK040S: Fluoride Soluble (QC Lot: 2236928)</b>									
ES1907782-001	ML VAL19	EK040S: Fluoride	16984-48-8	1	mg/kg	<5	<5	0.00	No Limit
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2236879)</b>									
ES1907782-001	ML VAL19	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit



Sub-Matrix: **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)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2236879) - continued</b>									
ES1907782-001	ML VAL19	EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			205-82-3						
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
<b>EP075(SIM): Benzo(a)pyrene TEQ (zero)</b>									
			----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2236666)</b>									
ES1907782-001	ML VAL19	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1907791-062	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2236880)</b>									
ES1907782-001	ML VAL19	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2236666)</b>									
ES1907782-001	ML VAL19	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1907791-062	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2236880)</b>									
ES1907782-001	ML VAL19	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
<b>EP080: BTEXN (QC Lot: 2236666)</b>									
ES1907782-001	ML VAL19	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1907791-062	Anonymous	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
		EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			106-42-3						
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit		



## Method Blank (MB) and Laboratory Control Spike (LCS) Report

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

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2240259)</b>									
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	99.1	86	120	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	104	80	114	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	102	87	123	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	106	80	122	
<b>EK040S: Fluoride Soluble (QCLot: 2236928)</b>									
EK040S: Fluoride	16984-48-8	1	mg/kg	<1	25 mg/kg	109	69	117	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2236879)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	96.3	77	125	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	103	72	124	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	102	73	127	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	102	72	126	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	106	75	127	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	108	77	127	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	108	73	127	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	110	74	128	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	90.4	69	123	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	93.5	75	127	
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	82.8	68	116	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	93.6	74	126	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	97.5	70	126	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	74.1	61	121	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	71.4	62	118	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	76.1	63	121	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2236666)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	114	68	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2236880)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	109	75	129	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	104	77	131	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	111	71	129	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2236666)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	115	68	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2236880)</b>									
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	103	77	125	



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2236880) - continued</b>								
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	105	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	111	63	131
<b>EP080: BTEXN (QCLot: 2236666)</b>								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	105	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	101	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	90.9	65	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	99.3	66	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	94.8	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	94.3	63	119

### Matrix Spike (MS) Report

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

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%) Low High	
<b>EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2240259)</b>							
ES1907763-003	Anonymous	EG005T: Copper	7440-50-8	250 mg/kg	99.0	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	97.2	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	97.5	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	102	70	130
<b>EK040S: Fluoride Soluble (QCLot: 2236928)</b>							
ES1907782-001	ML VAL19	EK040S: Fluoride	16984-48-8	25 mg/kg	101	70	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2236879)</b>							
ES1907782-001	ML VAL19	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	102	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	110	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2236666)</b>							
ES1907782-001	ML VAL19	EP080: C6 - C9 Fraction	----	32.5 mg/kg	96.6	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2236880)</b>							
ES1907782-001	ML VAL19	EP071: C10 - C14 Fraction	----	523 mg/kg	90.5	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	105	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	115	52	132
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2236666)</b>							
ES1907782-001	ML VAL19	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	93.8	70	130

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 Work Order : ES1907782  
 Client : RAMBOLL AUSTRALIA PTY LTD  
 Project : 31800585 BUFFER ZONE REMEDIATION-MUNICIPAL LANDFILL



Sub-Matrix: 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: 2236880)</b>								
ES1907782-001	ML VAL19	EP071: >C10 - C16 Fraction	----	860 mg/kg	100	73	137	
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	124	53	131	
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	120	52	132	
<b>EP080: BTEXN (QCLot: 2236666)</b>								
ES1907782-001	ML VAL19	EP080: Benzene	71-43-2	2.5 mg/kg	97.6	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	90.5	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	90.1	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	90.7	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	91.3	70	130	
	EP080: Naphthalene	91-20-3	2.5 mg/kg	90.9	70	130		

## QA/QC Compliance Assessment to assist with Quality Review

Work Order	: <b>ES1907782</b>	Page	: 1 of 7
Client	: <b>RAMBOLL AUSTRALIA PTY LTD</b>	Laboratory	: Environmental Division Sydney
Contact	: KIRSTY GREENFIELD	Telephone	: +61 2 8784 8555
Project	: 31800585 BUFFER ZONE REMEDIATION-MUNICIPAL LANDFILL	Date Samples Received	: 14-Mar-2019
Site	: ----	Issue Date	: 22-Mar-2019
Sampler	: J KIRSCH	No. of samples received	: 12
Order number	:	No. of samples analysed	: 7

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **Surrogate recovery outliers exist for all regular sample matrices - please see following pages for full details.**

#### Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

#### Outliers : Frequency of Quality Control Samples

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





### Regular Sample Surrogates

Sub-Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Samples Submitted</b>							
EP075(SIM)S: Phenolic Compound Surrogates	ES1907782-001	ML VAL19	<b>2.4.6-Tribromophenol</b>	118-79-6	33.7 %	40-138 %	<b>Recovery less than lower data quality objective</b>
EP075(SIM)S: Phenolic Compound Surrogates	ES1907782-002	ML VAL20	<b>2.4.6-Tribromophenol</b>	118-79-6	34.3 %	40-138 %	<b>Recovery less than lower data quality objective</b>
EP075(SIM)S: Phenolic Compound Surrogates	ES1907782-005	ML VAL23	<b>2.4.6-Tribromophenol</b>	118-79-6	28.7 %	40-138 %	<b>Recovery less than lower data quality objective</b>
EP075(SIM)S: Phenolic Compound Surrogates	ES1907782-006	ML VAL24	<b>2.4.6-Tribromophenol</b>	118-79-6	32.2 %	40-138 %	<b>Recovery less than lower data quality objective</b>
EP075(SIM)S: Phenolic Compound Surrogates	ES1907782-010	ML VAL28	<b>2.4.6-Tribromophenol</b>	118-79-6	31.8 %	40-138 %	<b>Recovery less than lower data quality objective</b>
EP075(SIM)S: Phenolic Compound Surrogates	ES1907782-011	D02_140319	<b>2.4.6-Tribromophenol</b>	118-79-6	29.9 %	40-138 %	<b>Recovery less than lower data quality objective</b>

### Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EA055: Moisture Content (Dried @ 105-110°C)</b>								
<b>Soil Glass Jar - Unpreserved (EA055)</b> ML VAL19, ML VAL23, ML VAL28, T01_140319	ML VAL20, ML VAL24, D02_140319,	14-Mar-2019	----	----	----	16-Mar-2019	28-Mar-2019	✓
<b>EA200: AS 4964 - 2004 Identification of Asbestos in Soils</b>								
<b>Snap Lock Bag (EA200)</b> ML VAL19, ML VAL23, ML VAL28	ML VAL20, ML VAL24,	14-Mar-2019	----	----	----	19-Mar-2019	10-Sep-2019	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EA200N: Asbestos Quantification (non-NATA)</b>								
<b>Snap Lock Bag (EA200N)</b>								
ML VAL19, ML VAL23, ML VAL28	ML VAL20, ML VAL24,	14-Mar-2019	----	----	----	19-Mar-2019	10-Sep-2019	✓
<b>EG005(ED093)T: Total Metals by ICP-AES</b>								
<b>Soil Glass Jar - Unpreserved (EG005T)</b>								
ML VAL19, ML VAL23, ML VAL28, T01_140319	ML VAL20, ML VAL24, D02_140319,	14-Mar-2019	18-Mar-2019	10-Sep-2019	✓	18-Mar-2019	10-Sep-2019	✓
<b>EK040S: Fluoride Soluble</b>								
<b>Soil Glass Jar - Unpreserved (EK040S)</b>								
ML VAL19, ML VAL23, ML VAL28, T01_140319	ML VAL20, ML VAL24, D02_140319,	14-Mar-2019	15-Mar-2019	21-Mar-2019	✓	15-Mar-2019	12-Apr-2019	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b>								
ML VAL19, ML VAL23, ML VAL28, T01_140319	ML VAL20, ML VAL24, D02_140319,	14-Mar-2019	15-Mar-2019	28-Mar-2019	✓	16-Mar-2019	24-Apr-2019	✓
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP071)</b>								
ML VAL19, ML VAL23, ML VAL28, T01_140319	ML VAL20, ML VAL24, D02_140319,	14-Mar-2019	15-Mar-2019	28-Mar-2019	✓	16-Mar-2019	24-Apr-2019	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b>								
ML VAL19, ML VAL23, ML VAL28, T01_140319	ML VAL20, ML VAL24, D02_140319,	14-Mar-2019	16-Mar-2019	28-Mar-2019	✓	18-Mar-2019	28-Mar-2019	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>								
<b>Soil Glass Jar - Unpreserved (EP071)</b>								
ML VAL19, ML VAL23, ML VAL28, T01_140319	ML VAL20, ML VAL24, D02_140319,	14-Mar-2019	15-Mar-2019	28-Mar-2019	✓	16-Mar-2019	24-Apr-2019	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b>								
ML VAL19, ML VAL23, ML VAL28, T01_140319	ML VAL20, ML VAL24, D02_140319,	14-Mar-2019	16-Mar-2019	28-Mar-2019	✓	18-Mar-2019	28-Mar-2019	✓
<b>EP080: BTEXN</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b>								
ML VAL19, ML VAL23, ML VAL28, T01_140319	ML VAL20, ML VAL24, D02_140319,	14-Mar-2019	16-Mar-2019	28-Mar-2019	✓	18-Mar-2019	28-Mar-2019	✓



## Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Reaular	Actual	Expected	Evaluation	
<b>Laboratory Duplicates (DUP)</b>							
Fluoride - Soluble	EK040S	1	7	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	7	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	7	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
<b>Laboratory Control Samples (LCS)</b>							
Fluoride - Soluble	EK040S	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
<b>Method Blanks (MB)</b>							
Fluoride - Soluble	EK040S	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
<b>Matrix Spikes (MS)</b>							
Fluoride - Soluble	EK040S	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard



## Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Asbestos Identification in Soils	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Asbestos Classification and Quantitation per NEPM 2013	* EA200N	SOIL	Asbestos Classification and Quantitation per NEPM 2013 with Confirmation of Identification by AS 4964 - 2004 Gravimetric determination of Asbestos Containing Material, Fibrous Asbestos, Asbestos Fines and sample weight and calculation of percentage concentrations per NEPM protocols. Asbestos (Fines and Fibrous FA+AF) is reported as the equivalent weight in the sample received after accounting for sub-sampling (where applicable for the <7mm and/or <2mm fractions).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Fluoride - Soluble	EK040S	SOIL	In house: Referenced to APHA 4500 F--C Soluble Fluoride is determined after a 1:5 soil/water extract using an ion selective electrode.
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM amended 2013.

Preparation Methods	Method	Matrix	Method Descriptions
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.





# CHAIN OF CUSTODY

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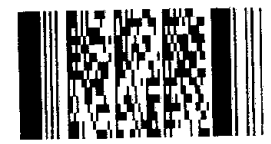
CLIENT: Ramboll		TURNAROUND REQUIREMENTS : <input type="checkbox"/> Standard TAT (List due date):		FOR LABORATORY USE ONLY (Circle)	
OFFICE: Hunter		(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)		Custody Seal Intact? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
PROJECT: Buffer Zone Remediation - Municipal Landfill PROJECT NO 318000585		ALS QUOTE NO.: EN-222-18		Free ice / frozen ice bricks present upon receipt? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
ORDER NUMBER:		PURCHASE ORDER NO.:		Random Sample Temperature on Receipt: 4.3 °C	
PROJECT MANAGER: Kirsty Greenfield		CONTACT PH: 0407 149 176		Other comment:	
SAMPLER: Jordyn Kirsch		SAMPLER MOBILE: 0421 330 255		RECEIVED BY: Sullivan	
COC Emailed to ALS? ( YES / NO)		EDD FORMAT (or default):		RECEIVED BY: AJ	
Email Reports to (will default to PM if no other addresses are listed):		RELINQUISHED BY: [Signature]		DATE/TIME: 11/4/19 19:30	
Email Invoice to (will default to PM if no other addresses are listed):		DATE/TIME: 10/04/19		DATE/TIME: 10/4/19 5:10pm	

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)				Additional Information
	LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	Soluble Fluoride	Cu, Ni, Pb, Zn	S-7	
1	ML_VAL29	10/04/19	Soil	Soil jars + bag	2	x	x	x	x	
2	ML_VAL30	9/04/19	Soil	Soil jars + bag	2	x	x	x	x	
3	ML_VAL31	10/04/19	Soil	Soil jars + bag	2					
4	ML_VAL32	9/10/19	Soil	Soil jars + bag	2					
5	ML_VAL33	10/04/19	Soil	Soil jars + bag	2	x	x	x	x	
6	ML_VAL34	9/04/19	Soil	Soil jars + bag	2	x	x	x	x	
7	ML_VAL36	9/04/19	Soil	Soil jars + bag	2					
8	ML_VAL38	9/04/19	Soil	Soil jars + bag	2					
9	ML_VAL39	9/04/19	Soil	Soil jars + bag	2	x	x	x	x	
10	ML_VAL40	9/04/19	Soil	Soil jars + bag	2	x	x	x	x	
11	ML_VAL41	9/04/19	Soil	Soil jars + bag	2	x	x	x	x	
12	ML_VAL42	10/04/19	Soil	Soil jars + bag	2	x	x	x	x	
TOTAL					22					

**E-MAILED**  
**LAB OF ORIGIN**  
**NEWCASTLE**

Environmental Division  
Sydney  
Work Order Reference  
**ES1911107**



Telephone : + 61-2-8784 8555

Comments on likely contaminant levels, or samples requiring specific QC analysis etc.

HOLD  
HOLD  
HOLD  
HOLD

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; AP - Airfreight Unpreserved Plastic  
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Specialisation 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; LI = Lugol's Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.



# CHAIN OF CUSTODY

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Ph: 02 4225 3125 E: wollongong@alsglobal.com

CLIENT: Ramboll		TURNAROUND REQUIREMENTS: <input type="checkbox"/> Standard TAT (List due date):		FOR LABORATORY USE ONLY (Circle)	
OFFICE: Hunter		<input checked="" type="checkbox"/> Non Standard or urgent TAT (List due date): <i>Fri 12/10</i> <small>(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)</small>		Custody Seal Intact? Yes No N/A	
PROJECT: Buffer Zone Remediation - Municipal Landfill PROJECT NO. 318000585		ALS QUOTE NO.: EN-222-18		Free ice / frozen ice bricks present upon receipt? Yes No N/A	
ORDER NUMBER: PURCHASE ORDER NO.:		COUNTRY OF ORIGIN: Australia		Random Sample Temperature on Receipt: °C	
PROJECT MANAGER: Kirsty Greenfield		CONTACT PH: 0407 149 176		Other comment:	
SAMPLER: Jordyn Kirsch		SAMPLER MOBILE: 0421 330 255		RECEIVED BY: <i>C. Sullivan</i>	
COC Emailed to ALS? ( YES / NO)		EDD FORMAT (or default):		RECEIVED BY: <i>AS</i>	
Email Reports to (will default to PM if no other addresses are listed):		RELINQUISHED BY: <i>[Signature]</i>		DATE/TIME: <i>11/4/19 19:30</i>	
Email Invoice to (will default to PM if no other addresses are listed):		DATE/TIME: <i>10/04/19</i>		DATE/TIME: <i>10/4/19 5pm</i>	

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)				Additional Information		
	LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	Scalable Fluoride	Cu, Ni, Pb, Zn	S-7	Filterable ACM by EN200N (0.001%)	Comments on local contamination levels, dilutions, samples requiring specific QA analysis	
	13	ML_VAL44	10/04/19	Soil	Soil jars + bag	2					HOLD	
	14	ML_VAL46	10/04/19	Soil	Soil jars + bag	2	x	x	x	x	HOLD	
	15	ML_VAL48	10/04/19	Soil	Soil jars + bag	2					HOLD	
	16	ML_VAL50	10/04/19	Soil	Soil jars + bag	2	x	x	x	x	HOLD	
	17	ML_VAL52	10/04/19	Soil	Soil jars + bag	2					HOLD	
	18	ML_VAL53	10/04/19	Soil	Soil jars + bag	2	x	x	x	x		
	19	ML_VAL54	10/04/19	Soil	Soil jars + bag	2	x	x	x	x		
	20	D03_100419	10/04/19	Soil	Soil jars + bag	2	x	x	x	x		
	21	D04_090419	9/04/19	Soil	Soil jar	1	x	x	x			
	<del>21</del>	T02_090418	9/04/19	Soil	Soil jar	1	x	x	x		Please send to Eurofins	
	<del>22</del>	D05_100419	9/04/19	Soil	Soil jars + bag	2	x	x	x	x		
TOTAL						20						

**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; AP - Airfreight Unpreserved Plastic  
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Specialion 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; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.





# CHAIN OF CUSTODY

ALS Laboratory: please tick →

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BRISBANE 2 Byth Street Stafford QLD 4053  
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MACKAY 78 Harbour Road Mackay QLD 4740  
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MUDGE 1/29 Sydney Road Mudgee NSW 2850  
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NEWCASTLE 5 Rose Gum Road Warabrook NSW 2304  
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MELBOURNE 2-4 Westall Road North Nowra NSW 2581  
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PERTH 10 Hod Way Malaga WA 6050  
Ph: 08 9209 7655 E: samples.perth@alsglobal.com

SYDNEY 277-289 Woodpark Road Smithfield NSW 2164  
Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

WOLLONGONG 14-15 Dasma Court Bohle QLD 4818  
Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com

WOLLONGONG 89 Kenny Street Wollongong NSW 2500  
Ph: 02 4225 3125 E: wollongong@alsglobal.com

CLIENT: Ramboll		TURNAROUND REQUIREMENTS : <input type="checkbox"/> Standard TAT (List due date):		FOR LABORATORY USE ONLY (Circle)	
OFFICE: Hunter		(Standard TAT may be longer for some tests e.g., Ultra Trace Organics) <input type="checkbox"/> Non Standard or urgent TAT (List due date):		Custody Seal Intact? Yes No <b>N/A</b>	
PROJECT: Buffer Zone Remediation - Municipal Landfill PROJECT NO 318000585		ALS QUOTE NO.: EN-222-18		Free ice / frozen ice bricks present upon receipt? Yes No <b>(No)</b> <b>N/A</b>	
ORDER NUMBER: PURCHASE ORDER NO.:		COUNTRY OF ORIGIN: Australia		Random Sample Temperature on Receipt: °C	
PROJECT MANAGER: Kirsty Greenfield		CONTACT PH: 0407 149 176		Other comment: <b>5.0</b>	
SAMPLER: Jordyn Kirsch		SAMPLER MOBILE: 0421 330 255		RECEIVED BY: <b>C Sullivan</b>	
COC Emailed to ALS? ( YES / NO)		EDD FORMAT (or default):		RECEIVED BY: <b>AJ</b>	
Email Reports to (will default to PM if no other addresses are listed):		RELINQUISHED BY: <b>[Signature]</b>		DATE/TIME: <b>12/4/19 14:30</b>	
Email Invoice to (will default to PM if no other addresses are listed):		DATE/TIME: <b>12/4/19 2:30</b>		DATE/TIME: <b>12/4/19 5pm</b>	
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: <b>add to workorder ES1911107</b>					

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).					Additional information	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	Soluble Fluoride	Cu, Ni, Pb, Zn	S-7	Friable ACM by EA200N (0.001%)			Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
23	ML_VAL37	11/04/19	Soil	Soil jars + bag	2	x	x	x	x			
24	ML_VAL43	11/04/19	Soil	Soil jars + bag	2	x	x	x	x			
25	ML_VAL45	11/04/19	Soil	Soil jars + bag	2	x	x	x	x			
26	ML_VAL47	12/04/19	Soil	Soil jars + bag	2	x	x	x	x			
27 same sample ID	ML_VAL49	12/04/19	Soil	Soil jars + bag	2	x	x	x	x			
28	ML_VAL49	12/04/19	Soil	Soil jars + bag	2	x	x	x	x			
29	ML_VAL51	12/04/19	Soil	Soil jars + bag	2	x	x	x	x			
30	ML_VAL55	12/04/19	Soil	Soil jars + bag	2	x	x	x	x			
31	ML_VAL56	12/04/19	Soil	Soil jars + bag	2	x	x	x	x			
32	ML_VAL57	12/04/19	Soil	Soil jars + bag	2	x	x	x	x			
33	ML_VAL58	12/04/19	Soil	Soil jars + bag	2	x	x	x	x			
34	ML_VAL59	12/04/19	Soil	Soil jars + bag	2	x	x	x	x			
TOTAL					22							

Environmental Division  
Sydney  
Work Order Reference  
**ES1911107**

Telephone : + 61-2-8784 8555

**LAB OF ORIGIN:  
NEWCASTLE  
E-MAILED**

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; AP = Airfreight Unpreserved Plastic  
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial 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; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.



# CHAIN OF CUSTODY

ALS Laboratory, please tick →

DADELAIDE 21 Burna Road Pooraka SA 5099  
Ph: 08 8359 0890 E: adelaide@alsglobal.com

BRISBANE 2 Byth Street Stafford QLD 4053  
Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

GLADSTONE 46 Callamandah Drive Clinton QLD 4830  
Ph: 07 7471 5900 E: gladstone@alsglobal.com

MACKAY 78 Harbour Road Mackay QLD 4740  
Ph: 07 4244 0177 E: mackay@alsglobal.com

MUDGEES 128 Sydney Road Mudgee NSW 2850  
Ph: 02 6372 6735 E: mudgee.mud@alsglobal.com

NEWCASTLE 5 Ross Gum Road Warabrook NSW 2304  
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MELBOURNE 2-4 Westall Boulevard North Nauras NSW 3760  
Ph: 03 8549 8500 E: samples.mel@alsglobal.com

PERTH 10 Hod Way Malaga WA 6000  
Ph: 08 9209 7855 E: samples.perth@alsglobal.com

SYDNEY 277-280 Woodpark Road Smithfield NSW 2184  
Ph: 02 8784 8385 E: samples.sydney@alsglobal.com

TOWNSVILLE 14-15 Desma Court Bohle QLD 4818  
Ph: 07 4736 0600 E: townesville.environmental@alsglobal.com

WOLLONGONG 89 Kenny Street Wollongong NSW 2500  
Ph: 02 4225 3129 E: wollongong@alsglobal.com

CLIENT: Ramboll		TURNAROUND REQUIREMENTS : <input type="checkbox"/> Standard TAT (List due date):		FOR LABORATORY USE ONLY (Circle)	
OFFICE: Hunter		(Standard TAT may be longer for some tests e.g. Ultra Trace Organics) <input type="checkbox"/> Non Standard or urgent TAT (List due date):		Custody Seal Intact? Yes No <u>N/A</u>	
PROJECT: Buffer Zone Remediation - Municipal Landfill PROJECT NO. 318000585		ALS QUOTE NO.: EN-222-18		Free ice / frozen ice bricks present upon receipt? Yes <u>No</u> N/A	
ORDER NUMBER: PURCHASE ORDER NO.:		COUNTRY OF ORIGIN: Australia		Random Sample Temperature on Receipt: °C <u>5.0</u>	
PROJECT MANAGER: Kirsty Greenfield		CONTACT PH: 0407 149 176		Other comment:	
SAMPLER: Jordyn Kirsch		SAMPLER MOBILE: 0421 330 265		RECEIVED BY: <u>C Sullivan</u>	
COC Emailed to ALS? ( YES / NO)		EDD FORMAT (or default):		RECEIVED BY: <u>AS</u>	
Email Reports to (will default to PM if no other addresses are listed):		RELINQUISHED BY: <u>[Signature]</u>		DATE/TIME: <u>12/4/19 14:30</u>	
Email Invoice to (will default to PM if no other addresses are listed):		DATE/TIME: <u>12/4/19 2:30</u>		DATE/TIME: <u>12/4/19 5pm</u>	

### COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS			CONTAINER INFORMATION	ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)					Additional Information		
	MATRIX	DATE / TIME	MATRIX		Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).							
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	Soluble Fluoride	Cu, Ni, Pb, Zn	ST	Fibrous ACM by EA200N (0.001%)		Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.	
35	ML_VAL60	12/04/19	Soil	Soil jars + bag	2	x	x	x	x			
36	ML_VAL61	12/04/19	Soil	Soil jars + bag	2	x	x	x	x			
37	ML_VAL62	12/04/19	Soil	Soil jars + bag	2	x	x	x	x			
38	ML_VAL63	12/04/19	Soil	Soil jars + bag	2	x	x	x	x			
39	ML_VAL64	12/04/19	Soil	Soil jars + bag	2	x	x	x	x			
40	ML_VAL65	12/04/19	Soil	Soil jars + bag	2	x	x	x	x			
41	ML_VAL66	12/04/19	Soil	Soil jars + bag	2	x	x	x	x			
42	ML_VAL67	12/04/19	Soil	Soil jars + bag	2	x	x	x	x			
43	ML_VAL68	12/04/19	Soil	Soil jars + bag	2	x	x	x	x			
44	ML_VAL69	12/04/19	Soil	Soil jars + bag	2	x	x	x	x		Please send to Eurofins	
45	ML_VAL70	12/04/19	Soil	Soil jars + bag	2	x	x	x	x			
46	ML_VAL71	12/04/19	Soil	Soil jars + bag	2	x	x	x	x			
TOTAL					22							

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; AP - Airfreight Unpreserved Plastic  
 V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Plastic  
 Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Solids; B = Unpreserved Bag; LI = Liquefied Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

# EMAILED



# CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 21 Burma Road Pteraka SA 5065  
Ph: 08 8369 0890 E: adelaide@alsglobal.com

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Ph: 07 4944 0177 E: mackay@alsglobal.com

MUDGEE 1229 Sydney Road Mudgee NSW 2850  
Ph: 02 6372 8733 E: mudgee@mail@alsglobal.com

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Ph: 07 4798 0800 E: townsville.environmental@alsglobal.com

WOLLONGONG 89 Kenny Street Wollongong NSW 2500  
Ph: 02 4225 3125 E: wollongong@alsglobal.com

CLIENT: Ramboll		TURNAROUND REQUIREMENTS : <input type="checkbox"/> Standard TAT (List due date):		FOR LABORATORY USE ONLY (Circle)	
OFFICE: Hunter		(Standard TAT may be longer for some tests e.g., Ultra Trace Organics)		Custody Seal Intact? Yes No N/A	
PROJECT: Buffer Zone Remediation - Municipal Landfill PROJECT NO. 318000585		ALS QUOTE NO.: EN-222-18		Free ice / frozen ice bricks present upon receipt? Yes No N/A	
ORDER NUMBER: PURCHASE ORDER NO.:		COUNTRY OF ORIGIN: Australia		Random Sample Temperature on Receipt: °C	
PROJECT MANAGER: Kirsty Greenfield		CONTACT PH: 0407 149 176		Other comment: 5.0	
SAMPLER: Jordyn Kirsch		SAMPLER MOBILE: 0421 330 255		RECEIVED BY: <i>[Signature]</i>	
COC Emailed to ALS? ( YES / NO)		EDD FORMAT (or default):		RELINQUISHED BY: <i>[Signature]</i>	
Email Reports to (will default to PM if no other addresses are listed):		DATE/TIME: 12/4/19 2:30		DATE/TIME: 12/4/19 14:30	
Email Invoice to (will default to PM if no other addresses are listed):		DATE/TIME: 12/4/19 5pm		DATE/TIME: 12/4/19	

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS			CONTAINER INFORMATION	ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)					Additional Information
	MATRIX: Solid(S) Water(W)				Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (fist filtered bottle required).					
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	Soluble Fluorides	Cu, Ni, Pb, Zn	S-7	Fluoride ACM by EA200N (0.001%)	
46	ML_VAL72	12/04/19	Soil	Soil jars + bag	2	x	x	x	x	
47	ML_VAL73	12/04/19	Soil	Soil jars + bag	2	x	x	x	x	
48	ML_VAL74	12/04/19	Soil	Soil jars + bag	2	x	x	x	x	
49	D06_120419	12/04/19	Soil	Soil jars + bag	2	x	x	x	x	
	T03_120419	12/04/19	Soil	Soil jars + bag	2	x	x	x	x	Please send to Eurofins
50	D07_120419	12/04/19	Soil	Soil jars + bag	2	x	x	x	x	
51	ML_VAL35	Extra Sample								
TOTAL					12					

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; AP - Airfreight Unpreserved Plastic  
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial 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; LI = Lugole Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

# EMAILED

## QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES1911107	Page	: 1 of 13
Client	: RAMBOLL AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: KIRSTY GREENFIELD	Telephone	: +61 2 8784 8555
Project	: 318000585 BUFFER ZONE REMEDIATION-MUNICIPAL LANDFILL	Date Samples Received	: 10-Apr-2019
Site	: ----	Issue Date	: 23-Apr-2019
Sampler	: J KIRSCH	No. of samples received	: 50
Order number	:	No. of samples analysed	: 43

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

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

#### Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

#### Outliers : Frequency of Quality Control Samples

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



## Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EA055: Moisture Content (Dried @ 105-110°C)</b>								
<b>Soil Glass Jar - Unpreserved (EA055)</b> ML_VAL30, ML_VAL39, ML_VAL41, D05_100419	ML_VAL34, ML_VAL40, D04_090419,	09-Apr-2019	----	----	----	12-Apr-2019	23-Apr-2019	✓
<b>Soil Glass Jar - Unpreserved (EA055)</b> ML_VAL29, ML_VAL42, ML_VAL50, ML_VAL54,	ML_VAL33, ML_VAL46, ML_VAL53, D03_100419	10-Apr-2019	----	----	----	12-Apr-2019	24-Apr-2019	✓
<b>Soil Glass Jar - Unpreserved (EA055)</b> ML_VAL37, ML_VAL45	ML_VAL43,	11-Apr-2019	----	----	----	16-Apr-2019	25-Apr-2019	✓
<b>Soil Glass Jar - Unpreserved (EA055)</b> ML_VAL47, ML_VAL51, ML_VAL56, ML_VAL58, ML_VAL60, ML_VAL62, ML_VAL64, ML_VAL66, ML_VAL68, ML_VAL71, ML_VAL73, D06_120419, ML_VAL35	ML_VAL49, ML_VAL55, ML_VAL57, ML_VAL59, ML_VAL61, ML_VAL63, ML_VAL65, ML_VAL67, ML_VAL70, ML_VAL72, ML_VAL74, D07_120419,	12-Apr-2019	----	----	----	16-Apr-2019	26-Apr-2019	✓



Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EA200: AS 4964 - 2004 Identification of Asbestos in Soils</b>							
<b>Snap Lock Bag - ACM/Asbestos Grab Bag (EA200)</b> ML_VAL30, ML_VAL39, ML_VAL41, ML_VAL34, ML_VAL40, D05_100419	<b>09-Apr-2019</b>	----	----	----	<b>12-Apr-2019</b>	06-Oct-2019	✓
<b>Snap Lock Bag - ACM/Asbestos Grab Bag (EA200)</b> ML_VAL29, ML_VAL42, ML_VAL50, ML_VAL54, ML_VAL33, ML_VAL46, ML_VAL53, D03_100419	<b>10-Apr-2019</b>	----	----	----	<b>12-Apr-2019</b>	07-Oct-2019	✓
<b>Snap Lock Bag - ACM/Asbestos Grab Bag (EA200)</b> ML_VAL37, ML_VAL45, ML_VAL43,	<b>11-Apr-2019</b>	----	----	----	<b>16-Apr-2019</b>	08-Oct-2019	✓
<b>Snap Lock Bag - ACM/Asbestos Grab Bag (EA200)</b> ML_VAL47, ML_VAL51, ML_VAL56, ML_VAL58, ML_VAL60, ML_VAL62, ML_VAL64, ML_VAL66, ML_VAL68, ML_VAL71, ML_VAL73, D06_120419, ML_VAL49, ML_VAL55, ML_VAL57, ML_VAL59, ML_VAL61, ML_VAL63, ML_VAL65, ML_VAL67, ML_VAL70, ML_VAL72, ML_VAL74, D07_120419	<b>12-Apr-2019</b>	----	----	----	<b>16-Apr-2019</b>	09-Oct-2019	✓



Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EA200N: Asbestos Quantification (non-NATA)</b>								
<b>Snap Lock Bag - ACM/Asbestos Grab Bag (EA200N)</b> ML_VAL30, ML_VAL39, ML_VAL41,	ML_VAL34, ML_VAL40, D05_100419	09-Apr-2019	----	----	----	12-Apr-2019	06-Oct-2019	✓
<b>Snap Lock Bag - ACM/Asbestos Grab Bag (EA200N)</b> ML_VAL29, ML_VAL42, ML_VAL50, ML_VAL54,	ML_VAL33, ML_VAL46, ML_VAL53, D03_100419	10-Apr-2019	----	----	----	12-Apr-2019	07-Oct-2019	✓
<b>Snap Lock Bag - ACM/Asbestos Grab Bag (EA200N)</b> ML_VAL37, ML_VAL45	ML_VAL43,	11-Apr-2019	----	----	----	16-Apr-2019	08-Oct-2019	✓
<b>Snap Lock Bag - ACM/Asbestos Grab Bag (EA200N)</b> ML_VAL47, ML_VAL51, ML_VAL56, ML_VAL58, ML_VAL60, ML_VAL62, ML_VAL64, ML_VAL66, ML_VAL68, ML_VAL71, ML_VAL73, D06_120419,	ML_VAL49, ML_VAL55, ML_VAL57, ML_VAL59, ML_VAL61, ML_VAL63, ML_VAL65, ML_VAL67, ML_VAL70, ML_VAL72, ML_VAL74, D07_120419	12-Apr-2019	----	----	----	16-Apr-2019	09-Oct-2019	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis				
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation		
<b>EG005(ED093)T: Total Metals by ICP-AES</b>									
<b>Soil Glass Jar - Unpreserved (EG005T)</b> ML_VAL30, ML_VAL39, ML_VAL41, D05_100419	ML_VAL34, ML_VAL40, D04_090419,	09-Apr-2019	15-Apr-2019	06-Oct-2019	✓	15-Apr-2019	06-Oct-2019	✓	
<b>Soil Glass Jar - Unpreserved (EG005T)</b> ML_VAL29, ML_VAL42, ML_VAL50, ML_VAL54,	ML_VAL33, ML_VAL46, ML_VAL53, D03_100419	10-Apr-2019	15-Apr-2019	07-Oct-2019	✓	15-Apr-2019	07-Oct-2019	✓	
<b>Soil Glass Jar - Unpreserved (EG005T)</b> ML_VAL37, ML_VAL45	ML_VAL43,	11-Apr-2019	16-Apr-2019	08-Oct-2019	✓	16-Apr-2019	08-Oct-2019	✓	
<b>Soil Glass Jar - Unpreserved (EG005T)</b> ML_VAL47, ML_VAL51, ML_VAL56, ML_VAL58, ML_VAL60, ML_VAL62, ML_VAL64, ML_VAL66, ML_VAL68, ML_VAL71, ML_VAL73, D06_120419, ML_VAL35	ML_VAL49, ML_VAL55, ML_VAL57, ML_VAL59, ML_VAL61, ML_VAL63, ML_VAL65, ML_VAL67, ML_VAL70, ML_VAL72, ML_VAL74, D07_120419,	12-Apr-2019	16-Apr-2019	09-Oct-2019	✓	16-Apr-2019	09-Oct-2019	✓	





Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EK040S: Fluoride Soluble</b>								
<b>Soil Glass Jar - Unpreserved (EK040S)</b> ML_VAL30, ML_VAL39, ML_VAL41, D05_100419 ML_VAL34, ML_VAL40, D04_090419,	<b>09-Apr-2019</b>	<b>15-Apr-2019</b>	16-Apr-2019	✓	<b>15-Apr-2019</b>	13-May-2019	✓	
<b>Soil Glass Jar - Unpreserved (EK040S)</b> ML_VAL29, ML_VAL42, ML_VAL50, ML_VAL54, ML_VAL33, ML_VAL46, ML_VAL53, D03_100419	<b>10-Apr-2019</b>	<b>15-Apr-2019</b>	17-Apr-2019	✓	<b>15-Apr-2019</b>	13-May-2019	✓	
<b>Soil Glass Jar - Unpreserved (EK040S)</b> ML_VAL37, ML_VAL45 ML_VAL43,	<b>11-Apr-2019</b>	<b>16-Apr-2019</b>	18-Apr-2019	✓	<b>16-Apr-2019</b>	14-May-2019	✓	
<b>Soil Glass Jar - Unpreserved (EK040S)</b> ML_VAL47, ML_VAL51, ML_VAL56, ML_VAL58, ML_VAL60, ML_VAL62, ML_VAL64, ML_VAL66, ML_VAL68, ML_VAL71, ML_VAL73, D06_120419, ML_VAL35 ML_VAL49, ML_VAL55, ML_VAL57, ML_VAL59, ML_VAL61, ML_VAL63, ML_VAL65, ML_VAL67, ML_VAL70, ML_VAL72, ML_VAL74, D07_120419,	<b>12-Apr-2019</b>	<b>16-Apr-2019</b>	19-Apr-2019	✓	<b>16-Apr-2019</b>	14-May-2019	✓	



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> ML_VAL30, ML_VAL39, ML_VAL41, D05_100419 ML_VAL34, ML_VAL40, D04_090419,	<b>09-Apr-2019</b>	<b>17-Apr-2019</b>	23-Apr-2019	✓	<b>17-Apr-2019</b>	27-May-2019	✓	
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> ML_VAL29, ML_VAL42, ML_VAL50, ML_VAL54, ML_VAL33, ML_VAL46, ML_VAL53, D03_100419	<b>10-Apr-2019</b>	<b>17-Apr-2019</b>	24-Apr-2019	✓	<b>17-Apr-2019</b>	27-May-2019	✓	
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> ML_VAL37, ML_VAL45 ML_VAL43,	<b>11-Apr-2019</b>	<b>16-Apr-2019</b>	25-Apr-2019	✓	<b>17-Apr-2019</b>	26-May-2019	✓	
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> ML_VAL70, ML_VAL72, ML_VAL74, D07_120419, ML_VAL71, ML_VAL73, D06_120419, ML_VAL35	<b>12-Apr-2019</b>	<b>16-Apr-2019</b>	26-Apr-2019	✓	<b>16-Apr-2019</b>	26-May-2019	✓	
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> ML_VAL47, ML_VAL51, ML_VAL56, ML_VAL58, ML_VAL60, ML_VAL62, ML_VAL64, ML_VAL66, ML_VAL68 ML_VAL49, ML_VAL55, ML_VAL57, ML_VAL59, ML_VAL61, ML_VAL63, ML_VAL65, ML_VAL67,	<b>12-Apr-2019</b>	<b>16-Apr-2019</b>	26-Apr-2019	✓	<b>17-Apr-2019</b>	26-May-2019	✓	



Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b> ML_VAL30, ML_VAL39, ML_VAL41, D05_100419	ML_VAL34, ML_VAL40, D04_090419,	09-Apr-2019	12-Apr-2019	23-Apr-2019	✓	17-Apr-2019	23-Apr-2019	✓
<b>Soil Glass Jar - Unpreserved (EP071)</b> ML_VAL30, ML_VAL39, ML_VAL41, D05_100419	ML_VAL34, ML_VAL40, D04_090419,	09-Apr-2019	17-Apr-2019	23-Apr-2019	✓	17-Apr-2019	27-May-2019	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> ML_VAL29, ML_VAL42, ML_VAL50, ML_VAL54,	ML_VAL33, ML_VAL46, ML_VAL53, D03_100419	10-Apr-2019	12-Apr-2019	24-Apr-2019	✓	17-Apr-2019	24-Apr-2019	✓
<b>Soil Glass Jar - Unpreserved (EP071)</b> ML_VAL29, ML_VAL42, ML_VAL50, ML_VAL54,	ML_VAL33, ML_VAL46, ML_VAL53, D03_100419	10-Apr-2019	17-Apr-2019	24-Apr-2019	✓	17-Apr-2019	27-May-2019	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> ML_VAL37, ML_VAL45	ML_VAL43,	11-Apr-2019	16-Apr-2019	25-Apr-2019	✓	17-Apr-2019	25-Apr-2019	✓
<b>Soil Glass Jar - Unpreserved (EP071)</b> ML_VAL70, ML_VAL72, ML_VAL74, D07_120419,	ML_VAL71, ML_VAL73, D06_120419, ML_VAL35	12-Apr-2019	16-Apr-2019	26-Apr-2019	✓	16-Apr-2019	26-May-2019	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> ML_VAL47, ML_VAL51, ML_VAL56, ML_VAL58, ML_VAL60, ML_VAL62, ML_VAL64, ML_VAL66, ML_VAL68, ML_VAL71, ML_VAL73, D06_120419, ML_VAL35	ML_VAL49, ML_VAL55, ML_VAL57, ML_VAL59, ML_VAL61, ML_VAL63, ML_VAL65, ML_VAL67, ML_VAL70, ML_VAL72, ML_VAL74, D07_120419,	12-Apr-2019	16-Apr-2019	26-Apr-2019	✓	17-Apr-2019	26-Apr-2019	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b> ML_VAL30, ML_VAL39, ML_VAL41, D05_100419	ML_VAL34, ML_VAL40, D04_090419,	09-Apr-2019	12-Apr-2019	23-Apr-2019	✓	17-Apr-2019	23-Apr-2019	✓
<b>Soil Glass Jar - Unpreserved (EP071)</b> ML_VAL30, ML_VAL39, ML_VAL41, D05_100419	ML_VAL34, ML_VAL40, D04_090419,	09-Apr-2019	17-Apr-2019	23-Apr-2019	✓	17-Apr-2019	27-May-2019	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> ML_VAL29, ML_VAL42, ML_VAL50, ML_VAL54,	ML_VAL33, ML_VAL46, ML_VAL53, D03_100419	10-Apr-2019	12-Apr-2019	24-Apr-2019	✓	17-Apr-2019	24-Apr-2019	✓
<b>Soil Glass Jar - Unpreserved (EP071)</b> ML_VAL29, ML_VAL42, ML_VAL50, ML_VAL54,	ML_VAL33, ML_VAL46, ML_VAL53, D03_100419	10-Apr-2019	17-Apr-2019	24-Apr-2019	✓	17-Apr-2019	27-May-2019	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> ML_VAL37, ML_VAL45	ML_VAL43,	11-Apr-2019	16-Apr-2019	25-Apr-2019	✓	17-Apr-2019	25-Apr-2019	✓
<b>Soil Glass Jar - Unpreserved (EP071)</b> ML_VAL70, ML_VAL72, ML_VAL74, D07_120419,	ML_VAL71, ML_VAL73, D06_120419, ML_VAL35	12-Apr-2019	16-Apr-2019	26-Apr-2019	✓	16-Apr-2019	26-May-2019	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> ML_VAL47, ML_VAL51, ML_VAL56, ML_VAL58, ML_VAL60, ML_VAL62, ML_VAL64, ML_VAL66, ML_VAL68, ML_VAL71, ML_VAL73, D06_120419, ML_VAL35	ML_VAL49, ML_VAL55, ML_VAL57, ML_VAL59, ML_VAL61, ML_VAL63, ML_VAL65, ML_VAL67, ML_VAL70, ML_VAL72, ML_VAL74, D07_120419,	12-Apr-2019	16-Apr-2019	26-Apr-2019	✓	17-Apr-2019	26-Apr-2019	✓



Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

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> ML_VAL30, ML_VAL39, ML_VAL41, D05_100419	ML_VAL34, ML_VAL40, D04_090419,	09-Apr-2019	12-Apr-2019	23-Apr-2019	✓	17-Apr-2019	23-Apr-2019	✓	
<b>Soil Glass Jar - Unpreserved (EP080)</b> ML_VAL29, ML_VAL42, ML_VAL50, ML_VAL54,	ML_VAL33, ML_VAL46, ML_VAL53, D03_100419	10-Apr-2019	12-Apr-2019	24-Apr-2019	✓	17-Apr-2019	24-Apr-2019	✓	
<b>Soil Glass Jar - Unpreserved (EP080)</b> ML_VAL37, ML_VAL45	ML_VAL43,	11-Apr-2019	16-Apr-2019	25-Apr-2019	✓	17-Apr-2019	25-Apr-2019	✓	
<b>Soil Glass Jar - Unpreserved (EP080)</b> ML_VAL47, ML_VAL51, ML_VAL56, ML_VAL58, ML_VAL60, ML_VAL62, ML_VAL64, ML_VAL66, ML_VAL68, ML_VAL71, ML_VAL73, D06_120419, ML_VAL35	ML_VAL49, ML_VAL55, ML_VAL57, ML_VAL59, ML_VAL61, ML_VAL63, ML_VAL65, ML_VAL67, ML_VAL70, ML_VAL72, ML_VAL74, D07_120419,	12-Apr-2019	16-Apr-2019	26-Apr-2019	✓	17-Apr-2019	26-Apr-2019	✓	



## Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Reaular	Actual	Expected	Evaluation	
<b>Laboratory Duplicates (DUP)</b>							
Fluoride - Soluble	EK040S	5	43	11.63	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	8	80	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	7	65	10.77	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	6	56	10.71	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	7	65	10.77	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	6	54	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
<b>Laboratory Control Samples (LCS)</b>							
Fluoride - Soluble	EK040S	3	43	6.98	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	4	65	6.15	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	3	56	5.36	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	4	65	6.15	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	3	54	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
<b>Method Blanks (MB)</b>							
Fluoride - Soluble	EK040S	3	43	6.98	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	4	65	6.15	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	3	56	5.36	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	4	65	6.15	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	3	54	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
<b>Matrix Spikes (MS)</b>							
Fluoride - Soluble	EK040S	3	43	6.98	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	4	65	6.15	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	3	56	5.36	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	4	65	6.15	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	3	54	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard



## Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Asbestos Identification in Soils	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Asbestos Classification and Quantitation per NEPM 2013	* EA200N	SOIL	Asbestos Classification and Quantitation per NEPM 2013 with Confirmation of Identification by AS 4964 - 2004 Gravimetric determination of Asbestos Containing Material, Fibrous Asbestos, Asbestos Fines and sample weight and calculation of percentage concentrations per NEPM protocols. Asbestos (Fines and Fibrous FA+AF) is reported as the equivalent weight in the sample received after accounting for sub-sampling (where applicable for the <7mm and/or <2mm fractions).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Fluoride - Soluble	EK040S	SOIL	In house: Referenced to APHA 4500 F--C Soluble Fluoride is determined after a 1:5 soil/water extract using an ion selective electrode.
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM amended 2013.

Preparation Methods	Method	Matrix	Method Descriptions
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.





## CERTIFICATE OF ANALYSIS

**Work Order** : **ES1911107**  
**Client** : **RAMBOLL AUSTRALIA PTY LTD**  
**Contact** : **KIRSTY GREENFIELD**  
**Address** :  
                   NEWCASTLE  
**Telephone** : +61 02 49344354  
**Project** : 318000585 BUFFER ZONE REMEDIATION-MUNICIPAL  
                   LANDFILL  
**Order number** :  
**C-O-C number** : ----  
**Sampler** : J KIRSCH  
**Site** : ----  
**Quote number** : EN/222  
**No. of samples received** : 50  
**No. of samples analysed** : 43

**Page** : 1 of 32  
**Laboratory** : Environmental Division Sydney  
**Contact** : Sepan Mahamad  
**Address** : 277-289 Woodpark Road Smithfield NSW Australia 2164  
**Telephone** : +61 2 8784 8555  
**Date Samples Received** : 10-Apr-2019 17:09  
**Date Analysis Commenced** : 12-Apr-2019  
**Issue Date** : 23-Apr-2019 11:59



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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits

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

### *Signatories*

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Alana Smylie	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW
Alex Rossi	Organic Chemist	Sydney Inorganics, Smithfield, NSW
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW



## General Comments

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

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

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

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

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

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

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

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero
- EA200N: Asbestos weights and percentages are not covered under the Scope of NATA Accreditation.  
Weights of Asbestos are based on extracted bulk asbestos, fibre bundles, and/or ACM and do not include respirable fibres (if present)  
The Asbestos (Fines and Fibrous) weight is calculated from the extracted Fibrous Asbestos and Asbestos Fines as an equivalent weight of 100% Asbestos  
Percentages for Asbestos content in ACM are based on the 2013 NEPM default values.  
All calculations of percentage Asbestos under this method are approximate and should be used as a guide only.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.
- EA200N: ALS laboratory procedures and methods used for the identification and quantitation of asbestos are consistent with AS4964-2004 and the requirements of the 2013 NEPM for Assessment of Site Contamination
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: 'No\*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML_VAL29	ML_VAL30	ML_VAL33	ML_VAL34	ML_VAL39
Client sampling date / time				10-Apr-2019 00:00	09-Apr-2019 00:00	10-Apr-2019 00:00	09-Apr-2019 00:00	09-Apr-2019 00:00	
Compound	CAS Number	LOR	Unit	ES1911107-001	ES1911107-002	ES1911107-005	ES1911107-006	ES1911107-009	
				Result	Result	Result	Result	Result	
<b>EA055: Moisture Content (Dried @ 105-110°C)</b>									
Moisture Content	----	1.0	%	6.7	11.7	7.5	4.9	12.9	
<b>EA200: AS 4964 - 2004 Identification of Asbestos in Soils</b>									
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No	
Asbestos (Trace)	1332-21-4	5	Fibres	No	No	No	No	No	
Asbestos Type	1332-21-4	-	--	-	-	-	-	-	
Sample weight (dry)	----	0.01	g	466	540	488	549	618	
APPROVED IDENTIFIER:	----	-	--	A. SMYLLIE	A. SMYLLIE	A. SMYLLIE	A. SMYLLIE	A. SMYLLIE	
<b>EA200N: Asbestos Quantification (non-NATA)</b>									
∅ Asbestos (Fines and Fibrous <7mm)	1332-21-4	0.0004	g	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	
∅ Asbestos (Fines and Fibrous FA+AF)	----	0.001	% (w/w)	<0.001	<0.001	<0.001	<0.001	<0.001	
∅ Asbestos Containing Material	1332-21-4	0.1	g	<0.1	<0.1	<0.1	<0.1	<0.1	
∅ Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	1332-21-4	0.01	% (w/w)	<0.01	<0.01	<0.01	<0.01	<0.01	
∅ Weight Used for % Calculation	----	0.0001	kg	0.466	0.540	0.488	0.549	0.618	
∅ Fibrous Asbestos >7mm	----	0.0004	g	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	
<b>EG005(ED093)T: Total Metals by ICP-AES</b>									
Copper	7440-50-8	5	mg/kg	<5	<5	<5	<5	<5	
Lead	7439-92-1	5	mg/kg	<5	<5	<5	<5	<5	
Nickel	7440-02-0	2	mg/kg	<2	<2	<2	<2	<2	
Zinc	7440-66-6	5	mg/kg	38	9	<5	<5	28	
<b>EK040S: Fluoride Soluble</b>									
Fluoride	16984-48-8	1	mg/kg	<1	<1	<1	<1	<1	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML_VAL29	ML_VAL30	ML_VAL33	ML_VAL34	ML_VAL39
Client sampling date / time					10-Apr-2019 00:00	09-Apr-2019 00:00	10-Apr-2019 00:00	09-Apr-2019 00:00	09-Apr-2019 00:00
Compound	CAS Number	LOR	Unit	ES1911107-001	ES1911107-002	ES1911107-005	ES1911107-006	ES1911107-009	
				Result	Result	Result	Result	Result	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>									
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10	
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50	
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10	
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50	
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50	
<b>EP080: BTEXN</b>									
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML_VAL29	ML_VAL30	ML_VAL33	ML_VAL34	ML_VAL39
Client sampling date / time					10-Apr-2019 00:00	09-Apr-2019 00:00	10-Apr-2019 00:00	09-Apr-2019 00:00	09-Apr-2019 00:00
Compound	CAS Number	LOR	Unit		ES1911107-001	ES1911107-002	ES1911107-005	ES1911107-006	ES1911107-009
					Result	Result	Result	Result	Result
<b>EP080: BTEXN - Continued</b>									
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	0.5	%		84.1	88.7	81.6	86.8	82.7
2-Chlorophenol-D4	93951-73-6	0.5	%		80.0	84.9	81.2	85.0	81.3
2,4,6-Tribromophenol	118-79-6	0.5	%		64.9	68.9	66.5	61.6	56.8
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	0.5	%		81.8	81.6	97.0	83.3	84.2
Anthracene-d10	1719-06-8	0.5	%		86.2	91.0	94.7	91.6	91.4
4-Terphenyl-d14	1718-51-0	0.5	%		81.7	85.9	93.1	87.1	87.4
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		115	114	114	132	123
Toluene-D8	2037-26-5	0.2	%		116	113	120	127	121
4-Bromofluorobenzene	460-00-4	0.2	%		119	115	120	127	118



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML_VAL40	ML_VAL41	ML_VAL42	ML_VAL46	ML_VAL50
Client sampling date / time				09-Apr-2019 00:00	09-Apr-2019 00:00	10-Apr-2019 00:00	10-Apr-2019 00:00	10-Apr-2019 00:00	
Compound	CAS Number	LOR	Unit	ES1911107-010	ES1911107-011	ES1911107-012	ES1911107-014	ES1911107-016	
				Result	Result	Result	Result	Result	
<b>EA055: Moisture Content (Dried @ 105-110°C)</b>									
Moisture Content	----	1.0	%	8.8	18.9	4.8	5.6	5.9	
<b>EA200: AS 4964 - 2004 Identification of Asbestos in Soils</b>									
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No	
Asbestos (Trace)	1332-21-4	5	Fibres	No	No	No	No	No	
Asbestos Type	1332-21-4	-	--	-	-	-	-	-	
Sample weight (dry)	----	0.01	g	785	561	588	533	522	
APPROVED IDENTIFIER:	----	-	--	A. SMYLIE	A. SMYLIE	A. SMYLIE	A. SMYLIE	A. SMYLIE	
<b>EA200N: Asbestos Quantification (non-NATA)</b>									
∅ Asbestos (Fines and Fibrous <7mm)	1332-21-4	0.0004	g	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	
∅ Asbestos (Fines and Fibrous FA+AF)	----	0.001	% (w/w)	<0.001	<0.001	<0.001	<0.001	<0.001	
∅ Asbestos Containing Material	1332-21-4	0.1	g	<0.1	<0.1	<0.1	<0.1	<0.1	
∅ Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	1332-21-4	0.01	% (w/w)	<0.01	<0.01	<0.01	<0.01	<0.01	
∅ Weight Used for % Calculation	----	0.0001	kg	0.785	0.561	0.588	0.533	0.522	
∅ Fibrous Asbestos >7mm	----	0.0004	g	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	
<b>EG005(ED093)T: Total Metals by ICP-AES</b>									
Copper	7440-50-8	5	mg/kg	<5	<5	<5	<5	<5	
Lead	7439-92-1	5	mg/kg	<5	<5	<5	<5	<5	
Nickel	7440-02-0	2	mg/kg	2	3	<2	<2	<2	
Zinc	7440-66-6	5	mg/kg	110	65	6	<5	<5	
<b>EK040S: Fluoride Soluble</b>									
Fluoride	16984-48-8	1	mg/kg	<1	<1	<1	<1	<1	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML_VAL40	ML_VAL41	ML_VAL42	ML_VAL46	ML_VAL50
Client sampling date / time				09-Apr-2019 00:00	09-Apr-2019 00:00	10-Apr-2019 00:00	10-Apr-2019 00:00	10-Apr-2019 00:00	
Compound	CAS Number	LOR	Unit	ES1911107-010	ES1911107-011	ES1911107-012	ES1911107-014	ES1911107-016	
				Result	Result	Result	Result	Result	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>									
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10	
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50	
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10	
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50	
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50	
<b>EP080: BTEXN</b>									
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML_VAL40	ML_VAL41	ML_VAL42	ML_VAL46	ML_VAL50
Client sampling date / time					09-Apr-2019 00:00	09-Apr-2019 00:00	10-Apr-2019 00:00	10-Apr-2019 00:00	10-Apr-2019 00:00
Compound	CAS Number	LOR	Unit		ES1911107-010	ES1911107-011	ES1911107-012	ES1911107-014	ES1911107-016
					Result	Result	Result	Result	Result
<b>EP080: BTEXN - Continued</b>									
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	0.5	%		88.0	83.0	85.5	80.1	84.1
2-Chlorophenol-D4	93951-73-6	0.5	%		89.7	85.5	90.0	86.1	83.6
2,4,6-Tribromophenol	118-79-6	0.5	%		60.8	52.1	55.8	49.9	51.6
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	0.5	%		80.6	81.6	97.5	83.7	89.0
Anthracene-d10	1719-06-8	0.5	%		89.3	84.9	91.7	87.9	90.6
4-Terphenyl-d14	1718-51-0	0.5	%		85.5	81.1	88.0	84.9	87.2
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		119	104	121	113	118
Toluene-D8	2037-26-5	0.2	%		118	103	126	116	123
4-Bromofluorobenzene	460-00-4	0.2	%		122	107	127	119	126





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML_VAL53	ML_VAL54	D03_100419	D04_090419	D05_100419
Client sampling date / time				10-Apr-2019 00:00	10-Apr-2019 00:00	10-Apr-2019 00:00	09-Apr-2019 00:00	09-Apr-2019 00:00	
Compound	CAS Number	LOR	Unit	ES1911107-018	ES1911107-019	ES1911107-020	ES1911107-021	ES1911107-022	
				Result	Result	Result	Result	Result	
<b>EA055: Moisture Content (Dried @ 105-110°C)</b>									
Moisture Content	----	1.0	%	4.0	11.0	7.5	19.6	6.3	
<b>EA200: AS 4964 - 2004 Identification of Asbestos in Soils</b>									
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	----	No	
Asbestos (Trace)	1332-21-4	5	Fibres	No	No	No	----	No	
Asbestos Type	1332-21-4	-	--	-	-	-	----	-	
Sample weight (dry)	----	0.01	g	778	644	553	----	560	
APPROVED IDENTIFIER:	----	-	--	A. SMYLIE	A. SMYLIE	A. SMYLIE	----	A. SMYLIE	
<b>EA200N: Asbestos Quantification (non-NATA)</b>									
∅ Asbestos (Fines and Fibrous <7mm)	1332-21-4	0.0004	g	<0.0004	<0.0004	<0.0004	----	<0.0004	
∅ Asbestos (Fines and Fibrous FA+AF)	----	0.001	% (w/w)	<0.001	<0.001	<0.001	----	<0.001	
∅ Asbestos Containing Material	1332-21-4	0.1	g	<0.1	<0.1	<0.1	----	<0.1	
∅ Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	1332-21-4	0.01	% (w/w)	<0.01	<0.01	<0.01	----	<0.01	
∅ Weight Used for % Calculation	----	0.0001	kg	0.778	0.644	0.553	----	0.560	
∅ Fibrous Asbestos >7mm	----	0.0004	g	<0.0004	<0.0004	<0.0004	----	<0.0004	
<b>EG005(ED093)T: Total Metals by ICP-AES</b>									
Copper	7440-50-8	5	mg/kg	<5	<5	<5	<5	<5	
Lead	7439-92-1	5	mg/kg	8	<5	<5	<5	<5	
Nickel	7440-02-0	2	mg/kg	<2	2	<2	3	<2	
Zinc	7440-66-6	5	mg/kg	105	65	20	112	<5	
<b>EK040S: Fluoride Soluble</b>									
Fluoride	16984-48-8	1	mg/kg	<1	<1	<1	<1	<1	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML_VAL53	ML_VAL54	D03_100419	D04_090419	D05_100419
Client sampling date / time				10-Apr-2019 00:00	10-Apr-2019 00:00	10-Apr-2019 00:00	09-Apr-2019 00:00	09-Apr-2019 00:00	
Compound	CAS Number	LOR	Unit	ES1911107-018	ES1911107-019	ES1911107-020	ES1911107-021	ES1911107-022	
				Result	Result	Result	Result	Result	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>									
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10	
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50	
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10	
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50	
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50	
<b>EP080: BTEXN</b>									
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML_VAL53	ML_VAL54	D03_100419	D04_090419	D05_100419
Client sampling date / time					10-Apr-2019 00:00	10-Apr-2019 00:00	10-Apr-2019 00:00	09-Apr-2019 00:00	09-Apr-2019 00:00
Compound	CAS Number	LOR	Unit		ES1911107-018	ES1911107-019	ES1911107-020	ES1911107-021	ES1911107-022
					Result	Result	Result	Result	Result
<b>EP080: BTEXN - Continued</b>									
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	0.5	%		88.3	81.0	83.6	90.1	87.2
2-Chlorophenol-D4	93951-73-6	0.5	%		81.1	83.7	84.9	89.2	84.8
2,4,6-Tribromophenol	118-79-6	0.5	%		50.2	63.5	48.9	78.7	74.2
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	0.5	%		88.5	82.9	88.0	86.2	87.7
Anthracene-d10	1719-06-8	0.5	%		91.8	88.4	92.2	94.6	96.0
4-Terphenyl-d14	1718-51-0	0.5	%		91.6	87.7	88.4	89.0	91.8
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		130	108	118	111	121
Toluene-D8	2037-26-5	0.2	%		128	111	122	109	123
4-Bromofluorobenzene	460-00-4	0.2	%		124	113	122	115	126



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML_VAL37	ML_VAL43	ML_VAL45	ML_VAL47	ML_VAL49
Client sampling date / time				11-Apr-2019 00:00	11-Apr-2019 00:00	11-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	
Compound	CAS Number	LOR	Unit	ES1911107-023	ES1911107-024	ES1911107-025	ES1911107-026	ES1911107-027	
				Result	Result	Result	Result	Result	
<b>EA055: Moisture Content (Dried @ 105-110°C)</b>									
Moisture Content	----	1.0	%	15.8	4.8	6.8	7.3	4.7	
<b>EA200: AS 4964 - 2004 Identification of Asbestos in Soils</b>									
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No	
Asbestos (Trace)	1332-21-4	5	Fibres	No	No	No	No	No	
Asbestos Type	1332-21-4	-	--	-	-	-	-	-	
Sample weight (dry)	----	0.01	g	443	471	391	490	612	
APPROVED IDENTIFIER:	----	-	--	A. SMYLLIE	A. SMYLLIE	A. SMYLLIE	A. SMYLLIE	A. SMYLLIE	
<b>EA200N: Asbestos Quantification (non-NATA)</b>									
∅ Asbestos (Fines and Fibrous <7mm)	1332-21-4	0.0004	g	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	
∅ Asbestos (Fines and Fibrous FA+AF)	----	0.001	% (w/w)	<0.001	<0.001	<0.001	<0.001	<0.001	
∅ Asbestos Containing Material	1332-21-4	0.1	g	<0.1	<0.1	<0.1	<0.1	<0.1	
∅ Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	1332-21-4	0.01	% (w/w)	<0.01	<0.01	<0.01	<0.01	<0.01	
∅ Weight Used for % Calculation	----	0.0001	kg	0.443	0.471	0.391	0.490	0.612	
∅ Fibrous Asbestos >7mm	----	0.0004	g	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	
<b>EG005(ED093)T: Total Metals by ICP-AES</b>									
Copper	7440-50-8	5	mg/kg	<5	<5	7	<5	<5	
Lead	7439-92-1	5	mg/kg	<5	<5	11	<5	6	
Nickel	7440-02-0	2	mg/kg	<2	<2	7	<2	5	
Zinc	7440-66-6	5	mg/kg	44	58	45	<5	12	
<b>EK040S: Fluoride Soluble</b>									
Fluoride	16984-48-8	1	mg/kg	<1	<1	<1	<1	7	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML_VAL37	ML_VAL43	ML_VAL45	ML_VAL47	ML_VAL49
Client sampling date / time				11-Apr-2019 00:00	11-Apr-2019 00:00	11-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	
Compound	CAS Number	LOR	Unit	ES1911107-023	ES1911107-024	ES1911107-025	ES1911107-026	ES1911107-027	
				Result	Result	Result	Result	Result	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>									
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10	
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50	
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10	
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50	
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50	
<b>EP080: BTEXN</b>									
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML_VAL37	ML_VAL43	ML_VAL45	ML_VAL47	ML_VAL49
Client sampling date / time					11-Apr-2019 00:00	11-Apr-2019 00:00	11-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00
Compound	CAS Number	LOR	Unit		ES1911107-023	ES1911107-024	ES1911107-025	ES1911107-026	ES1911107-027
					Result	Result	Result	Result	Result
<b>EP080: BTEXN - Continued</b>									
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	0.5	%		76.2	81.7	79.3	80.6	80.2
2-Chlorophenol-D4	93951-73-6	0.5	%		82.1	87.4	84.5	86.3	85.6
2,4,6-Tribromophenol	118-79-6	0.5	%		50.5	54.9	59.3	53.9	54.1
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	0.5	%		91.1	96.8	93.5	94.3	94.1
Anthracene-d10	1719-06-8	0.5	%		88.5	94.1	92.5	92.8	92.0
4-Terphenyl-d14	1718-51-0	0.5	%		94.2	102	98.7	99.6	99.5
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		105	109	115	112	108
Toluene-D8	2037-26-5	0.2	%		111	113	118	114	117
4-Bromofluorobenzene	460-00-4	0.2	%		97.2	102	109	101	105



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML_VAL51	ML_VAL55	ML_VAL56	ML_VAL57	ML_VAL58
Client sampling date / time				12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	
Compound	CAS Number	LOR	Unit	ES1911107-029	ES1911107-030	ES1911107-031	ES1911107-032	ES1911107-033	
				Result	Result	Result	Result	Result	
<b>EA055: Moisture Content (Dried @ 105-110°C)</b>									
Moisture Content	----	1.0	%	6.6	15.0	5.5	4.9	16.2	
<b>EA200: AS 4964 - 2004 Identification of Asbestos in Soils</b>									
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No	
Asbestos (Trace)	1332-21-4	5	Fibres	No	No	No	No	No	
Asbestos Type	1332-21-4	-	--	-	-	-	-	-	
Sample weight (dry)	----	0.01	g	518	573	457	348	528	
APPROVED IDENTIFIER:	----	-	--	A. SMYLIE	A. SMYLIE	A. SMYLIE	A. SMYLIE	A. SMYLIE	
<b>EA200N: Asbestos Quantification (non-NATA)</b>									
∅ Asbestos (Fines and Fibrous <7mm)	1332-21-4	0.0004	g	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	
∅ Asbestos (Fines and Fibrous FA+AF)	----	0.001	% (w/w)	<0.001	<0.001	<0.001	<0.001	<0.001	
∅ Asbestos Containing Material	1332-21-4	0.1	g	<0.1	<0.1	<0.1	<0.1	<0.1	
∅ Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	1332-21-4	0.01	% (w/w)	<0.01	<0.01	<0.01	<0.01	<0.01	
∅ Weight Used for % Calculation	----	0.0001	kg	0.518	0.573	0.457	0.348	0.528	
∅ Fibrous Asbestos >7mm	----	0.0004	g	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	
<b>EG005(ED093)T: Total Metals by ICP-AES</b>									
Copper	7440-50-8	5	mg/kg	<5	<5	<5	<5	<5	
Lead	7439-92-1	5	mg/kg	15	<5	<5	6	<5	
Nickel	7440-02-0	2	mg/kg	4	<2	<2	3	<2	
Zinc	7440-66-6	5	mg/kg	72	6	33	35	8	
<b>EK040S: Fluoride Soluble</b>									
Fluoride	16984-48-8	1	mg/kg	<1	<1	<1	<1	<1	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	







## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML_VAL51	ML_VAL55	ML_VAL56	ML_VAL57	ML_VAL58
Client sampling date / time					12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00
Compound	CAS Number	LOR	Unit		ES1911107-029	ES1911107-030	ES1911107-031	ES1911107-032	ES1911107-033
					Result	Result	Result	Result	Result
<b>EP080: BTEXN - Continued</b>									
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	0.5	%		80.4	81.2	80.3	82.6	80.0
2-Chlorophenol-D4	93951-73-6	0.5	%		85.6	86.4	85.4	88.2	85.3
2,4,6-Tribromophenol	118-79-6	0.5	%		57.3	56.1	54.5	55.1	54.3
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	0.5	%		94.6	94.6	93.8	96.0	92.5
Anthracene-d10	1719-06-8	0.5	%		92.8	92.9	92.2	94.4	91.8
4-Terphenyl-d14	1718-51-0	0.5	%		99.4	100	99.5	101	98.5
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		111	107	105	105	101
Toluene-D8	2037-26-5	0.2	%		118	110	110	114	107
4-Bromofluorobenzene	460-00-4	0.2	%		99.2	98.7	102	102	94.0



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML_VAL59	ML_VAL60	ML_VAL61	ML_VAL62	ML_VAL63
Client sampling date / time				12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	
Compound	CAS Number	LOR	Unit	ES1911107-034	ES1911107-035	ES1911107-036	ES1911107-037	ES1911107-038	
				Result	Result	Result	Result	Result	
<b>EA055: Moisture Content (Dried @ 105-110°C)</b>									
Moisture Content	----	1.0	%	5.2	15.5	6.3	5.9	7.1	
<b>EA200: AS 4964 - 2004 Identification of Asbestos in Soils</b>									
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No	
Asbestos (Trace)	1332-21-4	5	Fibres	No	No	No	No	No	
Asbestos Type	1332-21-4	-	--	-	-	-	-	-	
Sample weight (dry)	----	0.01	g	342	298	480	461	354	
APPROVED IDENTIFIER:	----	-	--	A. SMYLIE	A. SMYLIE	A. SMYLIE	A. SMYLIE	A. SMYLIE	
<b>EA200N: Asbestos Quantification (non-NATA)</b>									
∅ Asbestos (Fines and Fibrous <7mm)	1332-21-4	0.0004	g	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	
∅ Asbestos (Fines and Fibrous FA+AF)	----	0.001	% (w/w)	<0.001	<0.001	<0.001	<0.001	<0.001	
∅ Asbestos Containing Material	1332-21-4	0.1	g	<0.1	<0.1	<0.1	<0.1	<0.1	
∅ Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	1332-21-4	0.01	% (w/w)	<0.01	<0.01	<0.01	<0.01	<0.01	
∅ Weight Used for % Calculation	----	0.0001	kg	0.342	0.298	0.480	0.461	0.354	
∅ Fibrous Asbestos >7mm	----	0.0004	g	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	
<b>EG005(ED093)T: Total Metals by ICP-AES</b>									
Copper	7440-50-8	5	mg/kg	<5	5	<5	<5	<5	
Lead	7439-92-1	5	mg/kg	<5	7	6	<5	<5	
Nickel	7440-02-0	2	mg/kg	2	<2	2	<2	<2	
Zinc	7440-66-6	5	mg/kg	8	15	43	<5	14	
<b>EK040S: Fluoride Soluble</b>									
Fluoride	16984-48-8	1	mg/kg	<1	2	2	<1	<1	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML_VAL59	ML_VAL60	ML_VAL61	ML_VAL62	ML_VAL63
Client sampling date / time				12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	
Compound	CAS Number	LOR	Unit	ES1911107-034	ES1911107-035	ES1911107-036	ES1911107-037	ES1911107-038	
				Result	Result	Result	Result	Result	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>									
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10	
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50	
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10	
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50	
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50	
<b>EP080: BTEXN</b>									
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML_VAL59	ML_VAL60	ML_VAL61	ML_VAL62	ML_VAL63
Client sampling date / time				12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	
Compound	CAS Number	LOR	Unit	ES1911107-034	ES1911107-035	ES1911107-036	ES1911107-037	ES1911107-038	
				Result	Result	Result	Result	Result	
<b>EP080: BTEXN - Continued</b>									
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	0.5	%	82.8	78.8	76.7	80.3	82.4	
2-Chlorophenol-D4	93951-73-6	0.5	%	87.7	83.9	81.2	85.4	88.0	
2,4,6-Tribromophenol	118-79-6	0.5	%	57.0	53.6	54.0	56.7	57.4	
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	0.5	%	96.7	92.1	89.6	93.6	97.0	
Anthracene-d10	1719-06-8	0.5	%	94.8	91.0	88.3	93.3	96.6	
4-Terphenyl-d14	1718-51-0	0.5	%	103	97.2	94.1	99.2	103	
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	95.3	108	107	112	110	
Toluene-D8	2037-26-5	0.2	%	101	106	112	115	104	
4-Bromofluorobenzene	460-00-4	0.2	%	91.9	98.6	98.0	104	96.8	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML_VAL64	ML_VAL65	ML_VAL66	ML_VAL67	ML_VAL68
Client sampling date / time				12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	
Compound	CAS Number	LOR	Unit	ES1911107-039	ES1911107-040	ES1911107-041	ES1911107-042	ES1911107-043	
				Result	Result	Result	Result	Result	
<b>EA055: Moisture Content (Dried @ 105-110°C)</b>									
Moisture Content	----	1.0	%	5.6	4.3	3.4	6.6	2.7	
<b>EA200: AS 4964 - 2004 Identification of Asbestos in Soils</b>									
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No	
Asbestos (Trace)	1332-21-4	5	Fibres	No	No	No	No	No	
Asbestos Type	1332-21-4	-	--	-	-	-	-	-	
Sample weight (dry)	----	0.01	g	429	591	557	462	718	
APPROVED IDENTIFIER:	----	-	--	A. SMYLIE	A. SMYLIE	A. SMYLIE	A. SMYLIE	A. SMYLIE	
<b>EA200N: Asbestos Quantification (non-NATA)</b>									
∅ Asbestos (Fines and Fibrous <7mm)	1332-21-4	0.0004	g	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	
∅ Asbestos (Fines and Fibrous FA+AF)	----	0.001	% (w/w)	<0.001	<0.001	<0.001	<0.001	<0.001	
∅ Asbestos Containing Material	1332-21-4	0.1	g	<0.1	<0.1	<0.1	<0.1	<0.1	
∅ Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	1332-21-4	0.01	% (w/w)	<0.01	<0.01	<0.01	<0.01	<0.01	
∅ Weight Used for % Calculation	----	0.0001	kg	0.429	0.591	0.557	0.462	0.718	
∅ Fibrous Asbestos >7mm	----	0.0004	g	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	
<b>EG005(ED093)T: Total Metals by ICP-AES</b>									
Copper	7440-50-8	5	mg/kg	<5	<5	<5	<5	<5	
Lead	7439-92-1	5	mg/kg	<5	<5	<5	13	<5	
Nickel	7440-02-0	2	mg/kg	<2	<2	3	<2	4	
Zinc	7440-66-6	5	mg/kg	9	<5	<5	49	6	
<b>EK040S: Fluoride Soluble</b>									
Fluoride	16984-48-8	1	mg/kg	<1	<1	<1	1	<1	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML_VAL64	ML_VAL65	ML_VAL66	ML_VAL67	ML_VAL68
Client sampling date / time					12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00
Compound	CAS Number	LOR	Unit		ES1911107-039	ES1911107-040	ES1911107-041	ES1911107-042	ES1911107-043
					Result	Result	Result	Result	Result
<b>EP080: BTEXN - Continued</b>									
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	0.5	%		81.3	80.4	77.2	80.7	78.9
2-Chlorophenol-D4	93951-73-6	0.5	%		86.3	85.7	82.2	85.6	83.7
2,4,6-Tribromophenol	118-79-6	0.5	%		59.8	56.7	54.1	54.6	53.4
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	0.5	%		95.0	94.5	90.8	94.5	92.8
Anthracene-d10	1719-06-8	0.5	%		94.0	92.8	89.5	93.3	91.5
4-Terphenyl-d14	1718-51-0	0.5	%		100.0	99.7	95.8	99.2	97.0
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		114	107	110	109	113
Toluene-D8	2037-26-5	0.2	%		112	109	112	110	111
4-Bromofluorobenzene	460-00-4	0.2	%		98.3	98.9	99.8	98.5	103



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML_VAL70	ML_VAL71	ML_VAL72	ML_VAL73	ML_VAL74
Client sampling date / time				12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	
Compound	CAS Number	LOR	Unit	ES1911107-044	ES1911107-045	ES1911107-046	ES1911107-047	ES1911107-048	
				Result	Result	Result	Result	Result	
<b>EA055: Moisture Content (Dried @ 105-110°C)</b>									
Moisture Content	----	1.0	%	4.2	4.1	6.8	5.6	7.9	
<b>EA200: AS 4964 - 2004 Identification of Asbestos in Soils</b>									
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No	
Asbestos (Trace)	1332-21-4	5	Fibres	No	No	No	No	No	
Asbestos Type	1332-21-4	-	--	-	-	-	-	-	
Sample weight (dry)	----	0.01	g	535	522	490	448	467	
APPROVED IDENTIFIER:	----	-	--	A. SMYLIE	A. SMYLIE	A. SMYLIE	A. SMYLIE	A. SMYLIE	
<b>EA200N: Asbestos Quantification (non-NATA)</b>									
∅ Asbestos (Fines and Fibrous <7mm)	1332-21-4	0.0004	g	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	
∅ Asbestos (Fines and Fibrous FA+AF)	----	0.001	% (w/w)	<0.001	<0.001	<0.001	<0.001	<0.001	
∅ Asbestos Containing Material	1332-21-4	0.1	g	<0.1	<0.1	<0.1	<0.1	<0.1	
∅ Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	1332-21-4	0.01	% (w/w)	<0.01	<0.01	<0.01	<0.01	<0.01	
∅ Weight Used for % Calculation	----	0.0001	kg	0.535	0.522	0.490	0.448	0.467	
∅ Fibrous Asbestos >7mm	----	0.0004	g	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	
<b>EG005(ED093)T: Total Metals by ICP-AES</b>									
Copper	7440-50-8	5	mg/kg	<5	<5	<5	<5	<5	
Lead	7439-92-1	5	mg/kg	<5	<5	<5	<5	<5	
Nickel	7440-02-0	2	mg/kg	2	<2	2	4	<2	
Zinc	7440-66-6	5	mg/kg	<5	<5	8	7	104	
<b>EK040S: Fluoride Soluble</b>									
Fluoride	16984-48-8	1	mg/kg	<1	<1	<1	<1	<1	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	







## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	ML_VAL70	ML_VAL71	ML_VAL72	ML_VAL73	ML_VAL74
Client sampling date / time					12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00
Compound	CAS Number	LOR	Unit		ES1911107-044	ES1911107-045	ES1911107-046	ES1911107-047	ES1911107-048
					Result	Result	Result	Result	Result
<b>EP080: BTEXN - Continued</b>									
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	0.5	%		66.2	67.2	70.4	70.9	68.7
2-Chlorophenol-D4	93951-73-6	0.5	%		68.4	73.5	69.8	70.1	66.8
2,4,6-Tribromophenol	118-79-6	0.5	%		55.4	69.8	65.5	61.3	57.4
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	0.5	%		77.3	84.9	80.8	82.2	78.3
Anthracene-d10	1719-06-8	0.5	%		77.8	81.4	77.6	77.4	72.3
4-Terphenyl-d14	1718-51-0	0.5	%		71.3	79.9	76.4	75.9	72.0
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		98.4	100	98.2	97.8	96.6
Toluene-D8	2037-26-5	0.2	%		108	104	102	102	99.4
4-Bromofluorobenzene	460-00-4	0.2	%		118	113	111	112	108



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	D06_120419	D07_120419	ML_VAL35	----	----
Client sampling date / time				12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	----	----	
Compound	CAS Number	LOR	Unit	ES1911107-049	ES1911107-050	ES1911107-051	-----	-----	
				Result	Result	Result	----	----	
<b>EA055: Moisture Content (Dried @ 105-110°C)</b>									
Moisture Content	----	1.0	%	16.4	4.2	6.1	----	----	
<b>EA200: AS 4964 - 2004 Identification of Asbestos in Soils</b>									
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	----	----	----	
Asbestos (Trace)	1332-21-4	5	Fibres	No	No	----	----	----	
Asbestos Type	1332-21-4	-	--	-	-	----	----	----	
Sample weight (dry)	----	0.01	g	316	483	----	----	----	
APPROVED IDENTIFIER:	----	-	--	A. SMYLIE	A. SMYLIE	----	----	----	
<b>EA200N: Asbestos Quantification (non-NATA)</b>									
∅ Asbestos (Fines and Fibrous <7mm)	1332-21-4	0.0004	g	<0.0004	<0.0004	----	----	----	
∅ Asbestos (Fines and Fibrous FA+AF)	----	0.001	% (w/w)	<0.001	<0.001	----	----	----	
∅ Asbestos Containing Material	1332-21-4	0.1	g	<0.1	<0.1	----	----	----	
∅ Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	1332-21-4	0.01	% (w/w)	<0.01	<0.01	----	----	----	
∅ Weight Used for % Calculation	----	0.0001	kg	0.316	0.483	----	----	----	
∅ Fibrous Asbestos >7mm	----	0.0004	g	<0.0004	<0.0004	----	----	----	
<b>EG005(ED093)T: Total Metals by ICP-AES</b>									
Copper	7440-50-8	5	mg/kg	29	<5	<5	----	----	
Lead	7439-92-1	5	mg/kg	26	<5	<5	----	----	
Nickel	7440-02-0	2	mg/kg	<2	<2	2	----	----	
Zinc	7440-66-6	5	mg/kg	34	<5	<5	----	----	
<b>EK040S: Fluoride Soluble</b>									
Fluoride	16984-48-8	1	mg/kg	1	<1	1	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----	
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----	
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----	
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----	
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----	
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----	
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	----	
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	----	
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----	
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	D06_120419	D07_120419	ML_VAL35	----	----
Client sampling date / time				12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	----	----	
Compound	CAS Number	LOR	Unit	ES1911107-049	ES1911107-050	ES1911107-051	-----	-----	
				Result	Result	Result	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>									
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----	
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----	
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----	
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----	
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----	
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	----	----	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	----	----	
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	----	----	
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	----	----	
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	----	----	
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	----	----	
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	----	----	
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	----	----	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	----	----	
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	----	----	
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	----	----	
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	----	----	
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	----	----	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	----	----	
<b>EP080: BTEXN</b>									
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	----	----	
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----	
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	----	----	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----	
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	----	----	
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	----	----	
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	----	----	
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	----	----	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	D06_120419	D07_120419	ML_VAL35	----	----
Client sampling date / time				12-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	----	----	
Compound	CAS Number	LOR	Unit	ES1911107-049	ES1911107-050	ES1911107-051	-----	-----	
				Result	Result	Result	----	----	
<b>EP080: BTEXN - Continued</b>									
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	0.5	%	65.6	66.3	92.0	----	----	
2-Chlorophenol-D4	93951-73-6	0.5	%	67.6	68.3	90.0	----	----	
2,4,6-Tribromophenol	118-79-6	0.5	%	51.2	51.8	80.9	----	----	
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	0.5	%	73.9	75.2	82.2	----	----	
Anthracene-d10	1719-06-8	0.5	%	77.4	74.2	83.9	----	----	
4-Terphenyl-d14	1718-51-0	0.5	%	73.4	69.8	80.7	----	----	
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	90.6	96.7	100	----	----	
Toluene-D8	2037-26-5	0.2	%	94.1	101	103	----	----	
4-Bromofluorobenzene	460-00-4	0.2	%	107	112	113	----	----	



## Analytical Results

### Descriptive Results

Sub-Matrix: SOIL

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
<b>EA200: AS 4964 - 2004 Identification of Asbestos in Soils</b>		
EA200: Description	ML_VAL29 - 10-Apr-2019 00:00	Mid brown sandy soil.
EA200: Description	ML_VAL30 - 09-Apr-2019 00:00	Cream sandy soil.
EA200: Description	ML_VAL33 - 10-Apr-2019 00:00	Cream sandy soil.
EA200: Description	ML_VAL34 - 09-Apr-2019 00:00	Cream sandy soil.
EA200: Description	ML_VAL39 - 09-Apr-2019 00:00	Cream sandy soil.
EA200: Description	ML_VAL40 - 09-Apr-2019 00:00	Mid brown sandy soil.
EA200: Description	ML_VAL41 - 09-Apr-2019 00:00	Mid brown sandy soil.
EA200: Description	ML_VAL42 - 10-Apr-2019 00:00	Mid brown sandy soil.
EA200: Description	ML_VAL46 - 10-Apr-2019 00:00	Mid brown sandy soil.
EA200: Description	ML_VAL50 - 10-Apr-2019 00:00	Mid brown sandy soil.
EA200: Description	ML_VAL53 - 10-Apr-2019 00:00	Mid brown sandy soil.
EA200: Description	ML_VAL54 - 10-Apr-2019 00:00	Mid brown sandy soil.
EA200: Description	D03_100419 - 10-Apr-2019 00:00	Mid brown sandy soil.
EA200: Description	D05_100419 - 09-Apr-2019 00:00	Mid brown sandy soil.
EA200: Description	ML_VAL37 - 11-Apr-2019 00:00	Light brown sandy soil.
EA200: Description	ML_VAL43 - 11-Apr-2019 00:00	Light brown sandy soil.
EA200: Description	ML_VAL45 - 11-Apr-2019 00:00	Light brown sandy soil.
EA200: Description	ML_VAL47 - 12-Apr-2019 00:00	Cream sandy soil.
EA200: Description	ML_VAL49 - 12-Apr-2019 00:00	Light brown sandy soil.
EA200: Description	ML_VAL51 - 12-Apr-2019 00:00	Mid brown sandy soil.
EA200: Description	ML_VAL55 - 12-Apr-2019 00:00	Mid brown sandy soil.
EA200: Description	ML_VAL56 - 12-Apr-2019 00:00	Mid brown sandy soil.
EA200: Description	ML_VAL57 - 12-Apr-2019 00:00	Mid brown sandy soil.
EA200: Description	ML_VAL58 - 12-Apr-2019 00:00	Cream brown sandy soil.
EA200: Description	ML_VAL59 - 12-Apr-2019 00:00	Light brown sandy soil.
EA200: Description	ML_VAL60 - 12-Apr-2019 00:00	Light brown sandy soil.
EA200: Description	ML_VAL61 - 12-Apr-2019 00:00	Mid brown sandy soil.
EA200: Description	ML_VAL62 - 12-Apr-2019 00:00	Mid brown sandy soil.
EA200: Description	ML_VAL63 - 12-Apr-2019 00:00	Mid brown sandy soil.
EA200: Description	ML_VAL64 - 12-Apr-2019 00:00	Mid brown sandy soil.
EA200: Description	ML_VAL65 - 12-Apr-2019 00:00	Cream sandy soil.
EA200: Description	ML_VAL66 - 12-Apr-2019 00:00	Mid brown sandy soil.
EA200: Description	ML_VAL67 - 12-Apr-2019 00:00	Cream brown sandy soil.
EA200: Description	ML_VAL68 - 12-Apr-2019 00:00	Light brown sandy soil.
EA200: Description	ML_VAL70 - 12-Apr-2019 00:00	Light brown sandy soil.
EA200: Description	ML_VAL71 - 12-Apr-2019 00:00	Light brown sandy soil.
EA200: Description	ML_VAL72 - 12-Apr-2019 00:00	Light brown sandy soil.
EA200: Description	ML_VAL73 - 12-Apr-2019 00:00	Light brown sandy soil.



Sub-Matrix: **SOIL**

<i>Method: Compound</i>	<i>Client sample ID - Client sampling date / time</i>	<i>Analytical Results</i>
EA200: Description	ML_VAL74 - 12-Apr-2019 00:00	Cream sandy soil.
EA200: Description	D06_120419 - 12-Apr-2019 00:00	Mid brown sandy soil.
EA200: Description	D07_120419 - 12-Apr-2019 00:00	Light brown sandy soil.



## Surrogate Control Limits

Sub-Matrix: 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

<b>Work Order</b>	: <b>ES1911107</b>	<b>Page</b>	: 1 of 18
<b>Client</b>	: <b>RAMBOLL AUSTRALIA PTY LTD</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: <b>KIRSTY GREENFIELD</b>	<b>Contact</b>	: Sepan Mahamad
<b>Address</b>	:	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
	NEWCASTLE		
<b>Telephone</b>	: +61 02 49344354	<b>Telephone</b>	: +61 2 8784 8555
<b>Project</b>	: 318000585 BUFFER ZONE REMEDIATION-MUNICIPAL LANDFILL	<b>Date Samples Received</b>	: 10-Apr-2019
<b>Order number</b>	:	<b>Date Analysis Commenced</b>	: 12-Apr-2019
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 23-Apr-2019
<b>Sampler</b>	: J KIRSCH		
<b>Site</b>	: ----		
<b>Quote number</b>	: EN/222		
<b>No. of samples received</b>	: 50		
<b>No. of samples analysed</b>	: 43		



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

This Quality Control Report contains the following information:

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

### Signatories

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

Signatories	Position	Accreditation Category
Alana Smylie	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW
Alex Rossi	Organic Chemist	Sydney Inorganics, Smithfield, NSW
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW



## General Comments

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

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

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

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

## Laboratory Duplicate (DUP) Report

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

Sub-Matrix: SOIL

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 2296851)</b>									
ES1911107-016	ML_VAL50	EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.00	No Limit
ES1911104-001	Anonymous	EG005T: Nickel	7440-02-0	2	mg/kg	9	9	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	8	8	0.00	No Limit
<b>EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 2298413)</b>									
ES1911107-023	ML_VAL37	EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	44	22	66.3	No Limit
ES1911107-034	ML_VAL59	EG005T: Nickel	7440-02-0	2	mg/kg	2	2	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	8	8	0.00	No Limit
<b>EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 2298414)</b>									
ES1911107-044	ML_VAL70	EG005T: Nickel	7440-02-0	2	mg/kg	2	3	47.3	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	9	53.4	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	25	134	No Limit
ES1911174-001	Anonymous	EG005T: Nickel	7440-02-0	2	mg/kg	4	5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit



Sub-Matrix: 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>EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 2298414) - continued</b>									
ES1911174-001	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	8	10	17.9	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	6	6	0.00	No Limit
<b>EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2292677)</b>									
EM1905254-045	Anonymous	EA055: Moisture Content	----	0.1	%	0.9	1.1	24.5	0% - 50%
ES1911107-010	ML_VAL40	EA055: Moisture Content	----	0.1	%	8.8	8.7	0.00	No Limit
<b>EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2292679)</b>									
ES1911107-022	D05_100419	EA055: Moisture Content	----	0.1	%	6.3	5.5	14.5	No Limit
ES1911191-011	Anonymous	EA055: Moisture Content	----	0.1	%	17.1	17.4	1.68	0% - 20%
<b>EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2298845)</b>									
ES1911107-025	ML_VAL45	EA055: Moisture Content	----	0.1	%	6.8	6.8	0.00	No Limit
ES1911107-037	ML_VAL62	EA055: Moisture Content	----	0.1	%	5.9	5.6	5.25	No Limit
<b>EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2298846)</b>									
ES1911107-046	ML_VAL72	EA055: Moisture Content	----	0.1	%	6.8	6.9	0.00	No Limit
ES1911174-013	Anonymous	EA055: Moisture Content	----	0.1	%	12.4	12.5	1.13	0% - 50%
<b>EK040S: Fluoride Soluble (QC Lot: 2296855)</b>									
ES1911107-001	ML_VAL29	EK040S: Fluoride	16984-48-8	1	mg/kg	<1	<1	0.00	No Limit
ES1911107-016	ML_VAL50	EK040S: Fluoride	16984-48-8	1	mg/kg	<1	<1	0.00	No Limit
<b>EK040S: Fluoride Soluble (QC Lot: 2299542)</b>									
ES1911107-023	ML_VAL37	EK040S: Fluoride	16984-48-8	1	mg/kg	<1	<1	0.00	No Limit
ES1911107-033	ML_VAL58	EK040S: Fluoride	16984-48-8	1	mg/kg	<1	<1	0.00	No Limit
<b>EK040S: Fluoride Soluble (QC Lot: 2299543)</b>									
ES1911107-044	ML_VAL70	EK040S: Fluoride	16984-48-8	1	mg/kg	<1	<1	0.00	No Limit
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2293871)</b>									
ES1911107-001	ML_VAL29	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit



Sub-Matrix: 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)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2293871) - continued</b>									
ES1911107-001	ML_VAL29	EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1911107-018	ML_VAL53	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2296206)</b>									
ES1911107-023	ML_VAL37	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit



Sub-Matrix: 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)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2296206) - continued</b>										
ES1911107-023	ML_VAL37	EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
ES1911107-034	ML_VAL59	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
			205-82-3							
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit			
EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit			
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2296524)</b>										
ES1911558-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
			205-82-3							
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	



Sub-Matrix: 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)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2296524) - continued</b>											
ES1911558-001	Anonymous	EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
ES1911558-011	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2298293)</b>									
		ES1911468-014	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM): Acenaphthylene	208-96-8			0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
EP075(SIM): Acenaphthene	83-32-9			0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
EP075(SIM): Fluorene	86-73-7			0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
EP075(SIM): Phenanthrene	85-01-8			0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
EP075(SIM): Anthracene	120-12-7			0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
EP075(SIM): Fluoranthene	206-44-0			0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
EP075(SIM): Pyrene	129-00-0			0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
EP075(SIM): Benz(a)anthracene	56-55-3			0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
EP075(SIM): Chrysene	218-01-9			0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3			0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
EP075(SIM): Benzo(k)fluoranthene	207-08-9			0.5	mg/kg	<0.5	<0.5	0.00	No Limit		



Sub-Matrix: **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)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2298293) - continued</b>									
ES1911468-014	Anonymous	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2293059)</b>									
ES1911107-001	ML_VAL29	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1911107-018	ML_VAL53	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2293872)</b>									
ES1911107-001	ML_VAL29	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1911107-018	ML_VAL53	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2296205)</b>									
ES1911107-023	ML_VAL37	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1911107-034	ML_VAL59	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2296523)</b>									
ES1911558-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1911558-011	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	120	140	21.8	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2298292)</b>									
ES1911468-014	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2298296)</b>									
ES1911107-023	ML_VAL37	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1911107-034	ML_VAL59	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2298307)</b>									



Sub-Matrix: 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>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2298307) - continued</b>									
ES1911107-044	ML_VAL70	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1911174-136	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2293059)</b>									
ES1911107-001	ML_VAL29	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1911107-018	ML_VAL53	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2293872)</b>									
ES1911107-001	ML_VAL29	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1911107-018	ML_VAL53	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2296205)</b>									
ES1911107-023	ML_VAL37	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1911107-034	ML_VAL59	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2296523)</b>									
ES1911558-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1911558-011	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	130	170	27.3	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	140	130	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2298292)</b>									
ES1911468-014	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2298296)</b>									
ES1911107-023	ML_VAL37	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1911107-034	ML_VAL59	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2298307)</b>									
ES1911107-044	ML_VAL70	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1911174-136	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
<b>EP080: BTEXN (QC Lot: 2293059)</b>									
ES1911107-001	ML_VAL29	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit





Sub-Matrix: 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>EP080: BTEXN (QC Lot: 2293059) - continued</b>									
ES1911107-001	ML_VAL29	EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
ES1911107-018	ML_VAL53	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
<b>EP080: BTEXN (QC Lot: 2298296)</b>									
ES1911107-023	ML_VAL37	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
ES1911107-034	ML_VAL59	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
<b>EP080: BTEXN (QC Lot: 2298307)</b>									
ES1911107-044	ML_VAL70	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
ES1911174-136	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

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 Work Order : ES1911107  
 Client : RAMBOLL AUSTRALIA PTY LTD  
 Project : 318000585 BUFFER ZONE REMEDIATION-MUNICIPAL LANDFILL



Sub-Matrix: **SOIL**

				<i>Laboratory Duplicate (DUP) Report</i>					
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>LOR</i>	<i>Unit</i>	<i>Original Result</i>	<i>Duplicate Result</i>	<i>RPD (%)</i>	<i>Recovery Limits (%)</i>
<b>EP080: BTEXN (QC Lot: 2298307) - continued</b>									
ES1911174-136	Anonymous	EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit



## Method Blank (MB) and Laboratory Control Spike (LCS) Report

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

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2296851)</b>									
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	98.9	86	120	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	95.2	80	114	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	100	87	123	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	104	80	122	
<b>EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2298413)</b>									
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	106	86	120	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	103	80	114	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	107	87	123	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	112	80	122	
<b>EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2298414)</b>									
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	105	86	120	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	106	80	114	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	112	87	123	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	117	80	122	
<b>EK040S: Fluoride Soluble (QCLot: 2296855)</b>									
EK040S: Fluoride	16984-48-8	1	mg/kg	<1	25 mg/kg	100	69	117	
<b>EK040S: Fluoride Soluble (QCLot: 2299542)</b>									
EK040S: Fluoride	16984-48-8	1	mg/kg	<1	25 mg/kg	91.8	69	117	
<b>EK040S: Fluoride Soluble (QCLot: 2299543)</b>									
EK040S: Fluoride	16984-48-8	1	mg/kg	<1	25 mg/kg	88.8	69	117	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2293871)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	93.2	77	125	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	92.6	72	124	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	90.1	73	127	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	92.7	72	126	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	92.4	75	127	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	92.8	77	127	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	95.9	73	127	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	97.0	74	128	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	94.1	69	123	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	93.0	75	127	
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	6 mg/kg	94.2	68	116	
EP075(SIM): Benzo(k)fluoranthene	205-82-3								
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	94.5	74	126	



Sub-Matrix: 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	High
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2293871) - continued</b>									
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	88.9	70	126	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	86.5	61	121	
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	92.1	62	118	
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	91.1	63	121	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2296206)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	88.1	77	125	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	92.3	72	124	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	91.5	73	127	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	96.4	72	126	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	102	75	127	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	102	77	127	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	103	73	127	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	102	74	128	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	95.3	69	123	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	98.5	75	127	
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	6 mg/kg	94.4	68	116	
	205-82-3								
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	95.0	74	126	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	99.7	70	126	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	86.4	61	121	
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	84.8	62	118	
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	84.4	63	121	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2296524)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	106	77	125	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	117	72	124	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	115	73	127	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	117	72	126	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	120	75	127	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	120	77	127	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	124	73	127	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	124	74	128	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	102	69	123	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	104	75	127	
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	6 mg/kg	110	68	116	
	205-82-3								
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	110	74	126	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	110	70	126	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	91.3	61	121	
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	92.3	62	118	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2296524) - continued</b>									
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	81.4	63	121	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2298293)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	95.9	77	125	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	99.6	72	124	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	97.0	73	127	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	98.7	72	126	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	97.4	75	127	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	95.3	77	127	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	97.7	73	127	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	95.3	74	128	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	97.6	69	123	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	97.8	75	127	
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	98.1	68	116	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	95.1	74	126	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	94.0	70	126	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	92.3	61	121	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	98.3	62	118	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	98.7	63	121	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2293059)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	91.5	68	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2293872)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	100	75	129	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	97.6	77	131	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	99.8	71	129	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2296205)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	99.0	75	129	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	97.2	77	131	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	109	71	129	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2296523)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	100	75	129	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	97.8	77	131	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	86.4	71	129	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2298292)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	96.6	75	129	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	93.7	77	131	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	82.8	71	129	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2298296)</b>									



Sub-Matrix: 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 Petroleum Hydrocarbons (QCLot: 2298296) - continued</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	118	68	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2298307)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	93.9	68	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2293059)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	91.2	68	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2293872)</b>									
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	97.2	77	125	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	92.4	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	80.5	63	131	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2296205)</b>									
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	96.6	77	125	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	95.2	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	89.2	63	131	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2296523)</b>									
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	97.2	77	125	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	104	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	90.6	63	131	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2298292)</b>									
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	92.7	77	125	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	90.7	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	75.2	63	131	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2298296)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	114	68	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2298307)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	98.7	68	128	
<b>EP080: BTEXN (QCLot: 2293059)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	93.4	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	97.9	67	121	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	97.6	65	117	
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	99.2	66	118	
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	101	68	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	107	63	119	
<b>EP080: BTEXN (QCLot: 2298296)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	106	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	108	67	121	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	109	65	117	



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit		Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High
<b>EP080: BTEXN (QCLot: 2298296) - continued</b>								
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	109	66	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	110	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	111	63	119
<b>EP080: BTEXN (QCLot: 2298307)</b>								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	98.3	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	99.2	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	102	65	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	101	66	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	103	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	92.4	63	119

### Matrix Spike (MS) Report

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

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%) Low High	
<b>EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2296851)</b>							
ES1911104-001	Anonymous	EG005T: Copper	7440-50-8	250 mg/kg	95.3	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	96.9	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	97.1	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	97.2	70	130
<b>EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2298413)</b>							
ES1911107-023	ML_VAL37	EG005T: Copper	7440-50-8	250 mg/kg	94.1	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	93.8	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	96.2	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	86.9	70	130
<b>EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2298414)</b>							
ES1911174-001	Anonymous	EG005T: Copper	7440-50-8	250 mg/kg	95.3	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	93.3	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	95.4	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	98.1	70	130
<b>EK040S: Fluoride Soluble (QCLot: 2296855)</b>							
ES1911107-001	ML_VAL29	EK040S: Fluoride	16984-48-8	25 mg/kg	96.8	70	130



Sub-Matrix: SOIL

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EK040S: Fluoride Soluble (QCLot: 2299542)</b>							
ES1911107-023	ML_VAL37	EK040S: Fluoride	16984-48-8	25 mg/kg	102	70	130
<b>EK040S: Fluoride Soluble (QCLot: 2299543)</b>							
ES1911107-044	ML_VAL70	EK040S: Fluoride	16984-48-8	25 mg/kg	94.2	70	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2293871)</b>							
ES1911107-001	ML_VAL29	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	92.0	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	89.3	70	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2296206)</b>							
ES1911107-023	ML_VAL37	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	88.0	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	98.2	70	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2296524)</b>							
ES1911558-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	117	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	125	70	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2298293)</b>							
ES1911468-014	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	96.4	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	98.3	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2293059)</b>							
ES1911107-001	ML_VAL29	EP080: C6 - C9 Fraction	----	32.5 mg/kg	87.5	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2293872)</b>							
ES1911107-001	ML_VAL29	EP071: C10 - C14 Fraction	----	523 mg/kg	89.1	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	115	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	124	52	132
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2296205)</b>							
ES1911107-023	ML_VAL37	EP071: C10 - C14 Fraction	----	523 mg/kg	96.0	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	107	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	122	52	132
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2296523)</b>							
ES1911558-001	Anonymous	EP071: C10 - C14 Fraction	----	523 mg/kg	95.2	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	107	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	116	52	132
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2298292)</b>							
ES1911468-014	Anonymous	EP071: C10 - C14 Fraction	----	523 mg/kg	88.5	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	109	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	114	52	132
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2298296)</b>							
ES1911107-023	ML_VAL37	EP080: C6 - C9 Fraction	----	32.5 mg/kg	105	70	130





Sub-Matrix: SOIL

				Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2298307)</b>							
ES1911107-044	ML_VAL70	EP080: C6 - C9 Fraction	----	32.5 mg/kg	104	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2293059)</b>							
ES1911107-001	ML_VAL29	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	87.4	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2293872)</b>							
ES1911107-001	ML_VAL29	EP071: >C10 - C16 Fraction	----	860 mg/kg	105	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	118	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	118	52	132
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2296205)</b>							
ES1911107-023	ML_VAL37	EP071: >C10 - C16 Fraction	----	860 mg/kg	98.1	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	109	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	126	52	132
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2296523)</b>							
ES1911558-001	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	101	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	111	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	112	52	132
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2298292)</b>							
ES1911468-014	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	102	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	111	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	111	52	132
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2298296)</b>							
ES1911107-023	ML_VAL37	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	104	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2298307)</b>							
ES1911107-044	ML_VAL70	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	105	70	130
<b>EP080: BTEXN (QCLot: 2293059)</b>							
ES1911107-001	ML_VAL29	EP080: Benzene	71-43-2	2.5 mg/kg	83.7	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	92.7	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	98.1	70	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	97.0	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	102	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	108	70	130
<b>EP080: BTEXN (QCLot: 2298296)</b>							
ES1911107-023	ML_VAL37	EP080: Benzene	71-43-2	2.5 mg/kg	97.1	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	99.7	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	103	70	130



Sub-Matrix: **SOIL**

				<i>Matrix Spike (MS) Report</i>			
				<i>Spike</i>	<i>SpikeRecovery(%)</i>	<i>Recovery Limits (%)</i>	
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>Concentration</i>	<i>MS</i>	<i>Low</i>	<i>High</i>
<b>EP080: BTEXN (QCLot: 2298296) - continued</b>							
ES1911107-023	ML_VAL37	EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	99.5	70	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	101	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	89.1	70	130
<b>EP080: BTEXN (QCLot: 2298307)</b>							
ES1911107-044	ML_VAL70	EP080: Benzene	71-43-2	2.5 mg/kg	90.9	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	96.1	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	101	70	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	97.9	70	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	101	70	130
	EP080: Naphthalene	91-20-3	2.5 mg/kg	91.7	70	130	

#650881



**CHAIN OF CUSTODY**

ALS Laboratory, please tick →

ADELAIDE 21 Burma Road Pooraka SA 5005 Ph: 08 8359 0900 E: adelaide@alsglobal.com  
 BRISBANE 2 Byth Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com  
 GLADSTONE 48 Cullenmendis Drive Clinton QLD 4850 Ph: 07 7471 6600 E: gladstone@alsglobal.com  
 HOBART 78 Horecur Road Hobart TAS 7000 Ph: 07 4544 0177 E: mackay@alsglobal.com  
 MELBOURNE 2-4 Wootton Road Springvale VIC 3172 Ph: 03 6549 9600 E: samples.melbourne@alsglobal.com  
 MURDOCH 1/29 Sydney Road Murdoch NSW 2850 Ph: 02 6372 6735 E: murdoch\_msa@alsglobal.com  
 NEWCASTLE 5 Rose Gum Road Warabrook NSW 2304 Ph: 02 4608 5433 E: samples.newcastle@alsglobal.com  
 PERTH 10 Hood Way Midvale WA 6000 Ph: 08 9209 7655 E: samples.perth@alsglobal.com  
 SYDNEY 277-269 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 6555 E: samples.sydney@alsglobal.com  
 TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4706 0600 E: townsville.environmental@alsglobal.com  
 WOLLONGONG 69 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: wollongong@alsglobal.com

CLIENT: Ramboll  
 OFFICE: Hunter  
 PROJECT: Buffer Zone Remediation - Municipal Landfill PROJECT NO: 318000585 ALS QUOTE NO.: EN-222-18  
 ORDER NUMBER: PURCHASE ORDER NO.: COUNTRY OF ORIGIN: Australia  
 PROJECT MANAGER: Kirsty Greenfield CONTACT PH: 0407 149 175  
 SAMPLER: Jordyn Kirsch SAMPLER MOBILE: 0421 330 255  
 COC Emailed to ALS? (YES / NO) EDD FORMAT (or default):  
 Email Reports to (will default to PM if no other addresses are listed):  
 Email Invoice to (will default to PM if no other addresses are listed):

TURNAROUND REQUIREMENTS:  Standard TAT (List due date):  
 Non Standard or urgent TAT (List due date): Fri 12/04

FOR LABORATORY USE ONLY (Circle)  
 Custody Seal Intact? Yes  No  N/A  
 Freezer / frozen ice bricks present upon receipt? Yes  No  N/A  
 Random Sample Temperature on Receipt: 4.3 °C  
 Other comment:

RELINQUISHED BY: [Signature] RECEIVED BY: [Signature]  
 DATE/TIME: 10/04/19 DATE/TIME: 10/4/19 5:10pm  
 RELINQUISHED BY: DATE/TIME: RECEIVED BY: [Signature] DATE/TIME: 12/4/19 13:55pm

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS			CONTAINER INFORMATION	ANALYSIS REQUIRED including SUITES (NB - Suite Codes must be ticked to attract suite price)					Additional Information
	MATRIX: Solid(S) Water(W)	DATE / TIME	MATRIX		TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	Soluble Fluoride	Cu, Ni, Pb, Zn	S-7	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	Soluble Fluoride	Cu, Ni, Pb, Zn	S-7	Friable ACM by E2000H (0.001%)	Organised By / Date: Relinquished By / Date: Comments on likely contaminant levels, dilutions, or samples requiring specific COC analysis etc.
1	ML_VAL29	10/04/19	Soil	Soil jars + bag	2	x	x	x	x	
2	ML_VAL30	9/04/19	Soil	Soil jars + bag	2	x	x	x	x	
3	ML_VAL31	10/04/19	Soil	Soil jars + bag	2					
4	ML_VAL32	9/10/19	Soil	Soil jars + bag	2					HOLD
5	ML_VAL33	10/04/19	Soil	Soil jars + bag	2	x	x	x	x	HOLD
6	ML_VAL34	9/04/19	Soil	Soil jars + bag	2	x	x	x	x	
7	ML_VAL36	9/04/19	Soil	Soil jars + bag	2					HOLD
8	ML_VAL38	9/04/19	Soil	Soil jars + bag	2					HOLD
9	ML_VAL39	9/04/19	Soil	Soil jars + bag	2	x	x	x	x	
10	ML_VAL40	9/04/19	Soil	Soil jars + bag	2	x	x	x	x	
11	ML_VAL41	9/04/19	Soil	Soil jars + bag	2	x	x	x	x	
12	ML_VAL42	10/04/19	Soil	Soil jars + bag	2	x	x	x	x	
TOTAL					22					

Subcon / Forward Lab / Split WO  
 Lab Analysis  
 Organised By / Date:  
 Relinquished By / Date:  
 Comments on likely contaminant levels, dilutions, or samples requiring specific COC analysis etc.  
 Attach By PO / Internal Sheet:  
 Environmental Division  
 Sydney  
 Work Order Reference  
**ES1911107**  
 Telephone: - 61-2-8784 8555

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, AP = Airfreight Unpreserved Plastic  
 V = VOA Vial HCl Preserved, VB = VOA Vial Sodium Bisulphate Preserved, VS = VOA Vial Sulfuric Preserved, AV = Airfreight Unpreserved Vial 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; LI = Lugsals Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.



# CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 21 Borne Road Pteraka SA 5095  
Ph. 08 8359 0010 E. [adelaide@alsglobal.com](mailto:adelaide@alsglobal.com)

MELBOURNE 79 HARBOR ROAD MELBOURNE VIC 3000  
Ph. 07 4944 9177 E. [melb@alsglobal.com](mailto:melb@alsglobal.com)

NEWCASTLE 5 Flaxton Road Westmead NSW 2304  
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SYDNEY 277-209 Woodbank Road Smithfield NSW 2164  
Ph. 02 8764 8555 E. [samples.sydney@alsglobal.com](mailto:samples.sydney@alsglobal.com)

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DUNEDIN 7-4 W. Esplanade Dunedin 9010  
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GLADSTONE 48 Colquhoun Drive Clifton QLD 4260  
Ph. 07 7471 5000 E. [gladstone@alsglobal.com](mailto:gladstone@alsglobal.com)

MURDOCH 1220 Sydney Road Murdoch NSW 2250  
Ph. 02 6372 6735 E. [murdoch@alsglobal.com](mailto:murdoch@alsglobal.com)

PERTH 10 Hood Way Heston WA 6100  
Ph. 08 9229 7655 E. [samples.perth@alsglobal.com](mailto:samples.perth@alsglobal.com)

<b>CLIENT:</b> Ramboll		<b>TURNAROUND REQUIREMENTS:</b> <input type="checkbox"/> Standard TAT (List due date):		<b>FOR LABORATORY USE ONLY (Circle)</b>	
<b>OFFICE:</b> Hunter		(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)		Custody Seal Intact? Yes No N/A	
<b>PROJECT:</b> Buffer Zone Remediation - Municipal Landfill		<b>PROJECT NO:</b> J18000585		Free ice / frozen ice bricks present upon receipt? Yes No N/A	
<b>ORDER NUMBER:</b>		<b>ALS QUOTE NO.:</b> EN-222-18		Random Sample Temperature on Receipt C	
<b>PURCHASE ORDER NO.:</b>		<b>COUNTRY OF ORIGIN:</b> Australia		Other comment:	
<b>PROJECT MANAGER:</b> Kirsty Greenfield		<b>CONTACT PH:</b> 0407 149 176		COC SEQUENCE NUMBER (Circle)	
<b>SAMPLER:</b> Jordyn Kirsch		<b>SAMPLER MOBILE:</b> 0421 330 255		COC: 1 2 3 4 5 6 7	
<b>CDC Emailed to ALS? (YES / NO)</b>		<b>EDD FORMAT (or default):</b>		OF: 1 2 3 4 5 8 7	
<b>Relinquished By:</b> <i>[Signature]</i>		<b>Received By:</b> <i>C. Sullivan</i>		<b>Relinquished By:</b>	
<b>DATE/TIME:</b> 10/04/19		<b>DATE/TIME:</b> 10/4/19 5pm		<b>DATE/TIME:</b>	
<b>RECEIVED BY:</b> <i>[Signature]</i>		<b>DATE/TIME:</b> 10/4/19 3:55PM			

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION	ANALYSIS REQUIRED including SUITES (NB Suite Codes must be listed to extract suite price)					Additional Information		
	LAB ID	SAMPLE ID	DATE / TIME		MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	Where Metals are required, specify Total (unfiltered bottles required) or Dissolved (filtered bottles required)				
							Soluble Fluoride	Cu, Ni, Pb, Zn	\$:7	Fluoride ACCL by CACODIX (0.005%)		
13	ML_VAL44	10/04/19	Soil	Soil jars + bpg	2							HOLD
14	ML_VAL46	10/04/19	Soil	Soil jars + bag	2	x	x	x	x			
15	ML_VAL48	10/04/19	Soil	Soil jars + bag	2							HOLD
16	ML_VAL50	10/04/19	Soil	Soil jars + bag	2	x	x	x	x			
17	ML_VAL52	10/04/19	Soil	Soil jars + bag	2							HOLD
18	ML_VAL53	10/04/19	Soil	Soil jars + bag	2	x	x	x	x			
19	ML_VAL54	10/04/19	Soil	Soil jars + bag	2	x	x	x	x			
20	D03_100419	10/04/19	Soil	Soil jars + bag	2	x	x	x	x			
21	D04_090419	9/04/19	Soil	Soil jar	1	x	x	x				
<del>21</del>	T02_080418	9/04/19	Soil	Soil jar	1	x	x	x				Please send to Eurofins
<del>22</del>	D05_100419	9/04/19	Soil	Soil jars + bag	2	x	x	x	x			
<b>TOTAL</b>						20						

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; AP = Airtight Unpreserved Plastic  
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulfate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airtight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Spatiation 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 Solns; B = Unpreserved Bag; LI = Lugdun Iodine Preserved Bottle; STT = Sterile Sodium Thiosulfate Preserved Bottles

Ramboll Environ Australia Pty Ltd  
 Level 3/100 Pacific Highway  
 North Sydney  
 NSW 2060



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: K Greenfield

Report 650881-S  
 Project name BUFFER ZONE REMEDIATION - MUNICIPAL LANDFILL  
 Project ID 318000585  
 Received Date Apr 12, 2019

Client Sample ID			TO2_090418
Sample Matrix			Soil
Eurofins   mgt Sample No.			S19-Ap21130
Date Sampled			Apr 09, 2019
Test/Reference	LOR	Unit	
<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	%	51
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>			
Naphthalene <sup>N02</sup>	0.5	mg/kg	< 0.5
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1) <sup>N04</sup>	20	mg/kg	< 20
TRH >C10-C16	50	mg/kg	< 50
TRH >C10-C16 less Naphthalene (F2) <sup>N01</sup>	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100
<b>Total Recoverable Hydrocarbons</b>			
TRH C6-C9	20	mg/kg	< 20
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>			
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	< 50
TRH C29-C36	50	mg/kg	< 50
TRH C10-36 (Total)	50	mg/kg	< 50
<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

<b>Client Sample ID</b>			<b>TO2_090418</b>
<b>Sample Matrix</b>			<b>Soil</b>
<b>Eurofins   mgt Sample No.</b>			<b>S19-Ap21130</b>
<b>Date Sampled</b>			<b>Apr 09, 2019</b>
Test/Reference	LOR	Unit	
<b>Polycyclic Aromatic Hydrocarbons</b>			
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	%	87
p-Terphenyl-d14 (surr.)	1	%	93
<b>Fluoride</b>			
	100	mg/kg	< 100
<b>% Moisture</b>			
	1	%	7.6
<b>Heavy Metals</b>			
Copper	5	mg/kg	< 5
Lead	5	mg/kg	< 5
Nickel	5	mg/kg	< 5
Zinc	5	mg/kg	160

### 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
Eurofins   mgt Suite B4			
BTEX - Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices	Sydney	Apr 12, 2019	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Apr 12, 2019	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Apr 12, 2019	14 Day
Total Recoverable Hydrocarbons - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Apr 12, 2019	14 Day
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Apr 12, 2019	14 Day
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Sydney	Apr 12, 2019	14 Days
Fluoride - Method: LTM-INO-4150 Determination of Total Fluoride PART B – ISE	Melbourne	Apr 16, 2019	28 Day
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	Apr 15, 2019	180 Day
% Moisture - Method: LTM-GEN-7080 Moisture	Sydney	Apr 12, 2019	14 Day

<b>Company Name:</b> Ramboll Australia Pty Ltd	<b>Order No.:</b>	<b>Received:</b> Apr 12, 2019 3:55 PM
<b>Address:</b> Level 3/100 Pacific Highway North Sydney NSW 2060	<b>Report #:</b> 650881	<b>Due:</b> Apr 15, 2019
	<b>Phone:</b> 02 9954 8118	<b>Priority:</b> 1 Day
	<b>Fax:</b> 02 9954 8150	<b>Contact Name:</b> K Greenfield
<b>Project Name:</b> BUFFER ZONE REMEDIAITON - MUNICIPAL LANDFILL		
<b>Project ID:</b> 318000585		

**Eurofins | mgt Analytical Services Manager : Andrew Black**

Sample Detail						Copper	Fluoride	Lead	Nickel	Zinc	Moisture Set	Eurofins   mgt Suite B4
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>							X					
<b>Sydney Laboratory - NATA Site # 18217</b>						X		X	X	X	X	X
<b>Brisbane Laboratory - NATA Site # 20794</b>												
<b>Perth Laboratory - NATA Site # 23736</b>												
<b>External Laboratory</b>												
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID							
1	TO2_090418	Apr 09, 2019		Soil	S19-Ap21130	X	X	X	X	X	X	X
<b>Test Counts</b>						1	1	1	1	1	1	1



## Internal Quality Control Review and Glossary

### General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure, April 2011 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

### Holding Times

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

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

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

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

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

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

### Units

**mg/kg:** milligrams per kilogram

**mg/L:** milligrams per litre

**ug/L:** micrograms per litre

**ppm:** Parts per million

**ppb:** Parts per billion

**%:** Percentage

**org/100mL:** Organisms per 100 millilitres

**NTU:** Nephelometric Turbidity Units

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

### Terms

<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 and 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>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>QSM</b>	US Department of Defense Quality Systems Manual Version 5.2 2018
<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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.2 where no positive PFAS results have been reported have been reviewed and no data was affected.

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

### QC Data General Comments

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

**Quality Control Results**

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
<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>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
<b>Method Blank</b>							
<b>Total Recoverable Hydrocarbons</b>							
TRH C6-C9	mg/kg	< 20			20	Pass	
<b>Method Blank</b>							
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>							
TRH C10-C14	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>Heavy Metals</b>							
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
<b>LCS - % Recovery</b>							
<b>BTEX</b>							
Benzene	%	87			70-130	Pass	
Toluene	%	89			70-130	Pass	
Ethylbenzene	%	91			70-130	Pass	
m&p-Xylenes	%	93			70-130	Pass	
o-Xylene	%	94			70-130	Pass	
Xylenes - Total	%	93			70-130	Pass	

Test	Units	Result 1	Acceptance Limits	Pass Limits	Qualifying Code		
<b>LCS - % Recovery</b>							
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>							
Naphthalene	%	100	70-130	Pass			
TRH C6-C10	%	76	70-130	Pass			
TRH >C10-C16	%	95	70-130	Pass			
<b>LCS - % Recovery</b>							
<b>Total Recoverable Hydrocarbons</b>							
TRH C6-C9	%	81	70-130	Pass			
<b>LCS - % Recovery</b>							
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>							
TRH C10-C14	%	92	70-130	Pass			
<b>LCS - % Recovery</b>							
<b>Polycyclic Aromatic Hydrocarbons</b>							
Acenaphthene	%	96	70-130	Pass			
Acenaphthylene	%	97	70-130	Pass			
Anthracene	%	98	70-130	Pass			
Benz(a)anthracene	%	90	70-130	Pass			
Benzo(a)pyrene	%	86	70-130	Pass			
Benzo(b&j)fluoranthene	%	85	70-130	Pass			
Benzo(g,h,i)perylene	%	95	70-130	Pass			
Benzo(k)fluoranthene	%	91	70-130	Pass			
Chrysene	%	90	70-130	Pass			
Dibenz(a,h)anthracene	%	93	70-130	Pass			
Fluoranthene	%	96	70-130	Pass			
Fluorene	%	96	70-130	Pass			
Indeno(1,2,3-cd)pyrene	%	92	70-130	Pass			
Naphthalene	%	102	70-130	Pass			
Phenanthrene	%	102	70-130	Pass			
Pyrene	%	96	70-130	Pass			
<b>LCS - % Recovery</b>							
<b>Heavy Metals</b>							
Copper	%	102	70-130	Pass			
Lead	%	96	70-130	Pass			
Nickel	%	102	70-130	Pass			
Zinc	%	99	70-130	Pass			
Test	Lab Sample ID	QA Source	Units	Result 1	Acceptance Limits	Pass Limits	Qualifying Code
<b>Spike - % Recovery</b>							
<b>BTEX</b>				Result 1			
Benzene	S19-Ap19006	NCP	%	93	70-130	Pass	
Toluene	S19-Ap19006	NCP	%	84	70-130	Pass	
Ethylbenzene	S19-Ap19006	NCP	%	72	70-130	Pass	
m&p-Xylenes	S19-Ap19006	NCP	%	75	70-130	Pass	
o-Xylene	S19-Ap19006	NCP	%	84	70-130	Pass	
Xylenes - Total	S19-Ap19006	NCP	%	78	70-130	Pass	
<b>Spike - % Recovery</b>							
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>				Result 1			
Naphthalene	S19-Ap19006	NCP	%	89	70-130	Pass	
TRH C6-C10	S19-Ap17990	NCP	%	71	70-130	Pass	
TRH >C10-C16	S19-Ap20682	NCP	%	95	70-130	Pass	
<b>Spike - % Recovery</b>							
<b>Total Recoverable Hydrocarbons</b>				Result 1			
TRH C6-C9	S19-Ap17990	NCP	%	73	70-130	Pass	
<b>Spike - % Recovery</b>							
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>				Result 1			

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH C10-C14	S19-Ap20682	NCP	%	93			70-130	Pass	
<b>Spike - % Recovery</b>									
<b>Polycyclic Aromatic Hydrocarbons</b>				Result 1					
Acenaphthene	S19-Ap20682	NCP	%	104			70-130	Pass	
Acenaphthylene	S19-Ap20682	NCP	%	101			70-130	Pass	
Anthracene	S19-Ap20682	NCP	%	105			70-130	Pass	
Benz(a)anthracene	S19-Ap20682	NCP	%	90			70-130	Pass	
Benzo(a)pyrene	S19-Ap20682	NCP	%	93			70-130	Pass	
Benzo(b&i)fluoranthene	S19-Ap20682	NCP	%	84			70-130	Pass	
Benzo(g,h,i)perylene	S19-Ap20682	NCP	%	100			70-130	Pass	
Benzo(k)fluoranthene	S19-Ap20682	NCP	%	103			70-130	Pass	
Chrysene	S19-Ap20682	NCP	%	94			70-130	Pass	
Dibenz(a,h)anthracene	S19-Ap20682	NCP	%	95			70-130	Pass	
Fluoranthene	S19-Ap20682	NCP	%	99			70-130	Pass	
Fluorene	S19-Ap20682	NCP	%	99			70-130	Pass	
Indeno(1,2,3-cd)pyrene	S19-Ap20682	NCP	%	96			70-130	Pass	
Naphthalene	S19-Ap20682	NCP	%	108			70-130	Pass	
Phenanthrene	S19-Ap20682	NCP	%	107			70-130	Pass	
Pyrene	S19-Ap20682	NCP	%	99			70-130	Pass	
<b>Spike - % Recovery</b>									
<b>Heavy Metals</b>				Result 1					
Copper	S19-Ap19005	NCP	%	102			70-130	Pass	
Lead	S19-Ap19005	NCP	%	100			70-130	Pass	
Nickel	S19-Ap19005	NCP	%	98			70-130	Pass	
Zinc	S19-Ap19005	NCP	%	81			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
<b>Duplicate</b>									
<b>BTEX</b>				Result 1	Result 2	RPD			
Benzene	S19-Ap19005	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S19-Ap19005	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S19-Ap19005	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S19-Ap19005	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S19-Ap19005	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S19-Ap19005	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
<b>Duplicate</b>									
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>				Result 1	Result 2	RPD			
Naphthalene	S19-Ap19005	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S19-Ap19005	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S19-Ap20681	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S19-Ap20681	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S19-Ap20681	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
<b>Duplicate</b>									
<b>Total Recoverable Hydrocarbons</b>				Result 1	Result 2	RPD			
TRH C6-C9	S19-Ap19005	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
<b>Duplicate</b>									
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>				Result 1	Result 2	RPD			
TRH C10-C14	S19-Ap20681	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S19-Ap20681	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S19-Ap20681	NCP	mg/kg	< 50	< 50	<1	30%	Pass	

Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Acenaphthene	S19-Ap19061	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Acenaphthylene	S19-Ap19061	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Anthracene	S19-Ap19061	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benz(a)anthracene	S19-Ap19061	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(a)pyrene	S19-Ap19061	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(b&j)fluoranthene	S19-Ap19061	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(g,h,i)perylene	S19-Ap19061	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(k)fluoranthene	S19-Ap19061	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chrysene	S19-Ap19061	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dibenz(a,h)anthracene	S19-Ap19061	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluoranthene	S19-Ap19061	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluorene	S19-Ap19061	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	S19-Ap19061	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Naphthalene	S19-Ap19061	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Phenanthrene	S19-Ap19061	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Pyrene	S19-Ap19061	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	S19-Ap21130	CP	%	7.6	7.6	1.0	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Copper	S19-Ap18454	NCP	mg/kg	22	26	17	30%	Pass
Lead	S19-Ap18454	NCP	mg/kg	32	33	3.0	30%	Pass
Nickel	S19-Ap18454	NCP	mg/kg	< 5	< 5	<1	30%	Pass
Zinc	S19-Ap18454	NCP	mg/kg	7.1	7.7	9.0	30%	Pass

## Comments

### Sample Integrity

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

### Qualifier Codes/Comments

Code	Description
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

### Authorised By

Andrew Black	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)
Julie Kay	Senior Analyst-Inorganic (VIC)



### Glenn Jackson

#### General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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**CHAIN OF CUSTODY**  
 ALS Laboratory: please tick →

**ADDELAIDE** 21 Burma Road Poorala SA 5095 Ph 08 6259 0050 E. adelaide@alsglobal.com  
**BRISBANE** 2 Blyth Street Stafford QLD 4053 Ph 07 3243 7222 E. samples.brisbane@alsglobal.com  
**GLADSTONE** 49 Callender Drive Clifton QLD 4650 Ph 07 7471 5000 E. gladstone@alsglobal.com  
**MACKAY** 78 Forester Road Mackay QLD 4740 Ph 07 4944 0177 E. mackay@alsglobal.com  
**MELBOURNE** 2-4 Westgate Drive North Melbourne VIC 3048 Ph 03 6549 6600 E. samples.melbourne@alsglobal.com  
**MUDGEE** 103 Sydney Road Mudgee NSW 2850 Ph 02 6372 6735 E. mudgee@mail@alsglobal.com  
**NEWCASTLE** 5 Ross Gum Road Warwick NSW 2204 Ph 02 4509 6433 E. samples.newcastle@alsglobal.com  
**PERTH** 10 Hed Way Malaga WA 6000 Ph 08 6209 7025 E. samples.perth@alsglobal.com  
**SYDNEY** 277-289 Woodpark Road Smithfield NSW 2164 Ph 02 8784 6555 E. samples.sydney@alsglobal.com  
**TOWNSVILLE** 14-15 Osma Court Bohla QLD 4818 Ph 07 4700 0200 E. townsville.environmental@alsglobal.com  
**WOLLONGONG** 99 Kenny Street Wollongong NSW 2500 Ph 02 4225 3125 E. wollongong@alsglobal.com

CLIENT: Ramboll  
 OFFICE: Hunter  
 PROJECT: Buffer Zone Remediation - Municipal Landfill PROJECT NO 318000585  
 ORDER NUMBER: PURCHASE ORDER NO.:  
 PROJECT MANAGER: Kirsty Greenfield CONTACT PH: 0407 148 176  
 SAMPLER: Jordyn Kirsch SAMPLER MOBILE: 0421 330 255  
 COC Emailed to ALS? (YES / NO)  
 Email Reports to (will default to PM if no other addresses are listed):  
 Email Invoice to (will default to PM if no other addresses are listed):

TURNAROUND REQUIREMENTS:  Standard TAT (List due date);  
 (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)  Non Standard or urgent TAT (List due date):

ALS QUOTE NO.: EN-222-18  
 COUNTRY OF ORIGIN: Australia

COC SEQUENCE NUMBER (Circle)  
 COC: 1 2 3 4 5 6 7  
 OF: 1 2 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)  
 Custody Seal Intact? Yes No **NIA**  
 Free ice / frozen ice blocks present upon receipt? Yes **No** NIA  
 Random Sample Temperature on Receipt: °C  
 Other comment: 5.0

RELINQUISHED BY: *[Signature]* RECEIVED BY: *[Signature]*  
 DATE/TIME: 12/4/19 2:30 DATE/TIME: 12/4/19 14:30

RELINQUISHED BY: *[Signature]* RECEIVED BY: *[Signature]*  
 DATE/TIME: *[Signature]* DATE/TIME: 15/14

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: add to work order ES1911107

ALS USE ONLY	SAMPLE DETAILS		CONTAINER INFORMATION			ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)				Additional Information
	MATRIX: Solid(S) Water(W)					Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (filtered bottle required)				
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	Soluble Fluoride	Cu, Ni, Pb, Zn	Se7	Fritable ACM by EA2008 (0.001%)	
1. 23	ML_VAL37	11/04/19	Soil	Soil jars + bag	2	x	x	x	x	
2. 24	ML_VAL43	11/04/19	Soil	Soil jars + bag	2	x	x	x	x	
3. 25	ML_VAL45	11/04/19	Soil	Soil jars + bag	2	x	x	x	x	
4. 26	ML_VAL47	12/04/19	Soil	Soil jars + bag	2	x	x	x	x	
5. 27	ML_VAL49	12/04/19	Soil	Soil jars + bag	2	x	x	x	x	
6. 28	ML_VAL49	12/04/19	Soil	Soil jars + bag	2	x	x	x	x	
7. 29	ML_VAL51	12/04/19	Soil	Soil jars + bag	2	x	x	x	x	
8. 30	ML_VAL55	12/04/19	Soil	Soil jars + bag	2	x	x	x	x	
9. 31	ML_VAL56	12/04/19	Soil	Soil jars + bag	2	x	x	x	x	
10. 32	ML_VAL57	12/04/19	Soil	Soil jars + bag	2	x	x	x	x	
11. 33	ML_VAL58	12/04/19	Soil	Soil jars + bag	2	x	x	x	x	
12. 34	ML_VAL59	12/04/19	Soil	Soil jars + bag	2	x	x	x	x	
TOTAL					22					

Subcon / Forward Lab / Split WO  
 Lab / Analysis:  
 Organised By / Date:  
 Relinquished By / Date:  
 Connote / Courier:  
 WO No:  
 Attached By PO / Internal Sheet:

Environmental Division  
 Sydney  
 Work Order Reference  
**ES1911107**



Telephone : + 61-2-8784 8555

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, AP - Airfreight Unpreserved Plastic  
 V = VOA Vial HCl Preserved, VB = VOA Vial Sodium Bisulfate Preserved, VS = VOA Vial Sulfuric Preserved, AV = Airfreight Unpreserved Vial 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, LI = Lugals Iodine Preserved Bottles, STT = Sterile Sodium Thiosulfate Preserved Bottles.

#651143



# CHAIN OF CUSTODY

ALS Laboratory, please tick →

ADÉLAIDE 71 Burma Road Petrolia SA 5055  
Ph 08 8339 0090 E adelaide@alsglobal.com

BRISBANE 18 Riverside Road Mooroolbark VIC 3610  
Ph 07 4244 9177 E mooroolbark@alsglobal.com

ONE CASTLE 6 Rose Gully Road Warbrook NSW 2304  
Ph 02 4503 0433 E samp@newcastle@alsglobal.com

SYDNEY 277-279 Woodbank Road Smithfield NSW 2164  
Ph 02 8784 8255 E sydney@alsglobal.com

DURBAN 2 Blyth Street Sturdee QLD 4203  
Ph 07 3243 7222 E samples.brisbane@alsglobal.com

MELBOURNE 7-11 Westgate Drive North Melbourne VIC 3048  
Ph 03 8549 0009 E samp@melbourne@alsglobal.com

DUNEDIN 45 Cairnmuir Drive Clifton QLD 4203  
Ph 07 7471 5000 E goldstone@alsglobal.com

MURDOCH 129 Sydney Road Murdoch NSW 2203  
Ph 02 6372 6735 E murdoch@alsglobal.com

PERTH 10 Had Way Maida WA 6000  
Ph 08 9209 7075 E samples.perth@alsglobal.com

WOLLONGONG 89 Kenny Street Wollongong NSW 2500  
Ph 02 4320 3125 E wollongong@alsglobal.com

CLIENT: Ramboll		TURNAROUND REQUIREMENTS : <input type="checkbox"/> Standard TAT (List due date):		FOR LABORATORY USE ONLY (Circle)	
OFFICE: Hunter		(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)		Custody Seal Intact? Yes No <b>N/A</b>	
PROJECT: Buffer Zone Remediation - Municipal Landfill PROJECT NO 318000595		ALS QUOTE NO.: EN-222-18		Free ice / frozen ice bricks present upon receipt? Yes No <b>N/A</b>	
ORDER NUMBER: PURCHASE ORDER NO.:		COUNTRY OF ORIGIN: Australia		Random Sample Temperature on Receipt: C	
PROJECT MANAGER: Kirsty Greenfield CONTACT PH: 0407 149 176		COC SEQUENCE NUMBER (Circle)		Other comment: 5-0	
SAMPLER: Jordyn Kirsch SAMPLER MOBILE: 0421 330 255		OF: 1 2 3 4 5 6 7			
COC Emailed to ALS? ( YES / NO)		RECEIVED BY: <i>[Signature]</i>		RECEIVED BY:	
Email Reports to (will default to PM if no other addresses are listed):		DATE/TIME: 12/4/19 2:30		DATE/TIME:	
Email Invoice to (will default to PM if no other addresses are listed):		DATE/TIME: 12/4/19 14:30		DATE/TIME:	

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)					Additional Information
	LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	Sealable Fluoride	Du, Ni, Pb, Zn	Cr	Friable ACR by EA2001 (0.001%)	
13. 35	ML_VAL60	12/04/19	Soil	Soil jars + bag	2	x	x	x	x		
14. 36	ML_VAL61	12/04/19	Soil	Soil jars + bag	2	x	x	x	x		
15. 37	ML_VAL62	12/04/19	Soil	Soil jars + bag	2	x	x	x	x		
16. 38	ML_VAL63	12/04/19	Soil	Soil jars + bag	2	x	x	x	x		
17. 39	ML_VAL64	12/04/19	Soil	Soil jars + bag	2	x	x	x	x		
18. 40	ML_VAL65	12/04/19	Soil	Soil jars + bag	2	x	x	x	x		
19. 41	ML_VAL66	12/04/19	Soil	Soil jars + bag	2	x	x	x	x		
20. 42	ML_VAL67	12/04/19	Soil	Soil jars + bag	2	x	x	x	x		
21. 43	ML_VAL68	12/04/19	Soil	Soil jars + bag	2	x	x	x	x		
22. 44	ML_VAL69	12/04/19	Soil	Soil jars + bag	2	x	x	x	x	Please send to Eurofins	
23. 45	ML_VAL70	12/04/19	Soil	Soil jars + bag	2	x	x	x	x		
24. 46	ML_VAL71	12/04/19	Soil	Soil jars + bag	2	x	x	x	x		
					TOTAL	22					

Water Container Codes: P = Unpreserved Plastic, N = Nitric Preserved Plastic, ORC = Nitric Preserved ORC, SH = 500-um Hydroxide/Cd Preserved, S = Sodium Hydroxide Preserved Plastic, AG = Amber Glass Unpreserved, AP = Airtight Unpreserved Plastic  
V = VOA Vial HCl Preserved, VB = VOA Vial 500-um Bisulfate Preserved, VS = VOA Vial Sulfuric Preserved, AV = Airtight Unpreserved Vial SO<sub>2</sub> = Sulfuric Preserved Amber Glass, H = HCl preserved Plastic, HS = HCl preserved Spontaneous bottle, GP = Sulfuric Preserved Plastic, F = Formaldehyde Preserved Glass,  
Z = Zinc Acetate Preserved Bottle, E = EDTA Preserved Bottles, ST = Sterile Bottle, ASB = Plastic Bag for Acid Sulphate Soils, B = Unpreserved Bag, LI = Lugdunum Iodine Preserved Bottles, STT = Sterile Sodium Thiosulfate Preserved Bottles

#651143





# CHAIN OF CUSTODY

ALS Laboratory please tick →

ADDELADE 21 Duma Road/Peoria EA 5095  
Ph: 03 8329 6229 E: adelaide@alsglobal.com

ODRISBANE 2 Blyth Street Stafford QLD 4853  
Ph: 07 3243 7222 E: samples@alsglobal.com

DIGLADSTONE 43 Galvani Drive Carlton QLD 4200  
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DUNLUCK 16 Macquarie Road Mackay QLD 4740  
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DUUNOCE 1 29 Sydney Road Mudgee NSW 2850  
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Ph: 02 4205 0423 E: samples@newcastle.alsglobal.com

NEWCASTLE 2-4 Vernal Street North Newcastle NSW 2288  
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Ph: 08 9209 7010 E: samples@perth.alsglobal.com

SYDNEY 277 205 Woodpeck Road Emufield NSW 2104  
Ph: 02 8704 0155 E: samples@sydney.alsglobal.com

WOLLONGONG 14-15 Deuma Court Biale QLD 4816  
Ph: 07 4700 0500 E: townsville@newcastle.alsglobal.com

WOLLONGONG 93 Keny Street Wollongong NSW 2520  
Ph: 02 4225 0125 E: wollongong@alsglobal.com

CLIENT: Ramboll	TURNAROUND REQUIREMENTS : <input type="checkbox"/> Standard TAT (List due date): (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	FOR LABORATORY USE ONLY (Circle)	
OFFICE: Hunter	<input type="checkbox"/> Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No <b>N/A</b>	Free ice / frozen ice bricks present upon receipt? Yes No <b>N/A</b>
PROJECT: Buffer Zone Remediation - Municipal Landfill PROJECT NO 318000595	ALS QUOTE NO.: EN-222-18	Random Sample Temperature on Receipt: <b>5.0</b>	Other comment: <b>C</b>
ORDER NUMBER: PURCHASE ORDER NO.:	COUNTRY OF ORIGIN: Australia	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7	
PROJECT MANAGER: Kirsty Greenfield CONTACT PH: 0407 149 176	SAMPLER MOBILE: 0421 330 255	RELINQUISHED BY: <i>[Signature]</i>	RECEIVED BY: <i>[Signature]</i>
SAMPLER: Jordyn Kirsch	EDD FORMAT (or default):	DATE/TIME: 12/4/19 2:30	DATE/TIME: 12/4/19 14:30
COC Emailed to ALS? ( YES / NO)	Email Reports to (will default to PM if no other addresses are listed):	DATE/TIME:	DATE/TIME:
	Email Invoice to (will default to PM if no other addresses are listed):		

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION	ANALYSIS REQUIRED including SUITES (NB: Suite Codes must be listed to attract suite price) Where Metals are required specify Total (unfiltered bottles required) or Dissolved (filtered bottles required)				Additional Information					
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	Sessile Fluoride	Cu, Ni, Pb, Zn	Sr	Fluoride ACID by CAS002 (0.001%)					
25-46	ML_VAL72	12/04/19	Soil	Soil jars + bag	2	x	x	x	x					
26-47	ML_VAL73	12/04/19	Soil	Soil jars + bag	2	x	x	x	x					
27-48	ML_VAL74	12/04/19	Soil	Soil jars + bag	2	x	x	x	x					
28-49	D06_120419	12/04/19	Soil	Soil jars + bag	2	x	x	x	x					
29	T03_120419	12/04/19	Soil	Soil jars + bag	2	x	x	x	x					Please send to Eurofins
30	D07_120419	12/04/19	Soil	Soil jars + bag	2	x	x	x	x					
TOTAL					12									

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; AP = Air/freight Unpreserved Plastic  
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulfate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Air/freight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HG = HCl preserved Spoon/loop bottle; EP = 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 Solts; B = Unpreserved Bag; LI = Lugol's Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles

#651143

Ramboll Environ Australia Pty Ltd  
 Level 3/100 Pacific Highway  
 North Sydney  
 NSW 2060



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: Jordyn Kirsch

Report 651143-S  
 Project name BUFFER ZONE REMEDIATION - MUNICIPAL LANDFILL  
 Project ID 318000585  
 Received Date Apr 15, 2019

Client Sample ID			ML_VAL69	TO3_120419
Sample Matrix			Soil	Soil
Eurofins   mgt Sample No.			S19-Ap23550	S19-Ap23551
Date Sampled			Apr 12, 2019	Apr 12, 2019
Test/Reference	LOR	Unit		
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>				
TRH C6-C9	20	mg/kg	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50
<b>BTEX</b>				
Benzene	0.1	mg/kg	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	91	78
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>				
Naphthalene <sup>N02</sup>	0.5	mg/kg	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20
TRH C6-C10 less BTEX (F1) <sup>N04</sup>	20	mg/kg	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) <sup>N01</sup>	50	mg/kg	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100
<b>Polycyclic Aromatic Hydrocarbons</b>				
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5
Benzo(b&j)fluoranthene <sup>N07</sup>	0.5	mg/kg	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5

<b>Client Sample ID</b>			<b>ML_VAL69</b>	<b>TO3_120419</b>
<b>Sample Matrix</b>			<b>Soil</b>	<b>Soil</b>
<b>Eurofins   mgt Sample No.</b>			<b>S19-Ap23550</b>	<b>S19-Ap23551</b>
<b>Date Sampled</b>			<b>Apr 12, 2019</b>	<b>Apr 12, 2019</b>
Test/Reference	LOR	Unit		
<b>Polycyclic Aromatic Hydrocarbons</b>				
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	106	106
p-Terphenyl-d14 (surr.)	1	%	108	105
<b>Fluoride</b>				
	100	mg/kg	< 100	< 100
<b>% Moisture</b>				
	1	%	6.1	17
<b>Heavy Metals</b>				
Copper	5	mg/kg	< 5	11
Lead	5	mg/kg	5.6	15
Nickel	5	mg/kg	< 5	< 5
Zinc	5	mg/kg	65	34

### 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
Eurofins   mgt Suite B4			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Apr 17, 2019	14 Day
BTEX - Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices	Melbourne	Apr 17, 2019	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Apr 17, 2019	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Apr 17, 2019	14 Day
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Melbourne	Apr 17, 2019	14 Day
Fluoride - Method: LTM-INO-4150 Determination of Total Fluoride PART B – ISE	Melbourne	Apr 18, 2019	28 Day
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Apr 17, 2019	180 Day
% Moisture - Method: LTM-GEN-7080 Moisture	Melbourne	Apr 15, 2019	14 Day

<b>Company Name:</b> Ramboll Australia Pty Ltd	<b>Order No.:</b>	<b>Received:</b> Apr 15, 2019 2:35 PM
<b>Address:</b> Level 3/100 Pacific Highway North Sydney NSW 2060	<b>Report #:</b> 651143	<b>Due:</b> Apr 24, 2019
	<b>Phone:</b> 02 9954 8118	<b>Priority:</b> 5 Day
	<b>Fax:</b> 02 9954 8150	<b>Contact Name:</b> Jordyn Kirsch
<b>Project Name:</b> BUFFER ZONE REMEDIATION - MUNICIPAL LANDFILL		
<b>Project ID:</b> 318000585		

**Eurofins | mgt Analytical Services Manager : Andrew Black**

Sample Detail						Asbestos - WA guidelines	Copper	Fluoride	Lead	Nickel	Zinc	Moisture Set	Eurofins   mgt Suite B4
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>							X	X	X	X	X	X	X
<b>Sydney Laboratory - NATA Site # 18217</b>						X							
<b>Brisbane Laboratory - NATA Site # 20794</b>													
<b>Perth Laboratory - NATA Site # 23736</b>													
<b>External Laboratory</b>													
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID								
1	ML_VAL69	Apr 12, 2019		Soil	S19-Ap23550	X	X	X	X	X	X	X	X
2	TO3_120419	Apr 12, 2019		Soil	S19-Ap23551	X	X	X	X	X	X	X	X
<b>Test Counts</b>						2	2	2	2	2	2	2	2

## Internal Quality Control Review and Glossary

### General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure, April 2011 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- This report replaces any interim results previously issued.

### Holding Times

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

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

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

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

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

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

### Units

<b>mg/kg:</b> milligrams per kilogram	<b>mg/L:</b> milligrams per litre	<b>ug/L:</b> micrograms per litre
<b>ppm:</b> Parts per million	<b>ppb:</b> Parts per billion	<b>%:</b> Percentage
<b>org/100mL:</b> Organisms per 100 millilitres	<b>NTU:</b> Nephelometric Turbidity Units	<b>MPN/100mL:</b> 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 and 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>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>QSM</b>	US Department of Defense Quality Systems Manual Version 5.2 2018
<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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.2 where no positive PFAS results have been reported have been reviewed and no data was affected.

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

### QC Data General Comments

- 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.
- 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.
- Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
- Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
- 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.
- 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.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
- For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
- 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>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
<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>							
Fluoride	mg/kg	< 100			100	Pass	
<b>Method Blank</b>							
<b>Heavy Metals</b>							
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
<b>LCS - % Recovery</b>							
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>							
TRH C6-C9	%	119			70-130	Pass	
TRH C10-C14	%	129			70-130	Pass	
<b>LCS - % Recovery</b>							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code	
<b>BTEX</b>								
Benzene	%	109			70-130	Pass		
Toluene	%	104			70-130	Pass		
Ethylbenzene	%	101			70-130	Pass		
m&p-Xylenes	%	104			70-130	Pass		
Xylenes - Total	%	103			70-130	Pass		
<b>LCS - % Recovery</b>								
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>								
Naphthalene	%	84			70-130	Pass		
TRH C6-C10	%	121			70-130	Pass		
TRH >C10-C16	%	115			70-130	Pass		
<b>LCS - % Recovery</b>								
<b>Polycyclic Aromatic Hydrocarbons</b>								
Acenaphthene	%	97			70-130	Pass		
Acenaphthylene	%	101			70-130	Pass		
Anthracene	%	104			70-130	Pass		
Benz(a)anthracene	%	106			70-130	Pass		
Benzo(a)pyrene	%	102			70-130	Pass		
Benzo(b&j)fluoranthene	%	110			70-130	Pass		
Benzo(g,h,i)perylene	%	96			70-130	Pass		
Benzo(k)fluoranthene	%	101			70-130	Pass		
Chrysene	%	105			70-130	Pass		
Dibenz(a,h)anthracene	%	92			70-130	Pass		
Fluoranthene	%	102			70-130	Pass		
Fluorene	%	100			70-130	Pass		
Indeno(1,2,3-cd)pyrene	%	110			70-130	Pass		
Naphthalene	%	107			70-130	Pass		
Phenanthrene	%	105			70-130	Pass		
Pyrene	%	103			70-130	Pass		
<b>LCS - % Recovery</b>								
Fluoride	%	104			70-130	Pass		
<b>LCS - % Recovery</b>								
<b>Heavy Metals</b>								
Copper	%	100			80-120	Pass		
Lead	%	103			80-120	Pass		
Nickel	%	103			80-120	Pass		
Zinc	%	102			80-120	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>				Result 1				
TRH C6-C9	S19-Ap24143	NCP	%	100		70-130	Pass	
TRH C10-C14	S19-Ap24145	NCP	%	86		70-130	Pass	
<b>Spike - % Recovery</b>								
<b>BTEX</b>				Result 1				
Benzene	S19-Ap24143	NCP	%	87		70-130	Pass	
Toluene	S19-Ap24143	NCP	%	91		70-130	Pass	
Ethylbenzene	S19-Ap24143	NCP	%	95		70-130	Pass	
m&p-Xylenes	S19-Ap24143	NCP	%	100		70-130	Pass	
o-Xylene	S19-Ap24143	NCP	%	98		70-130	Pass	
Xylenes - Total	S19-Ap24143	NCP	%	99		70-130	Pass	
<b>Spike - % Recovery</b>								
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>				Result 1				
Naphthalene	S19-Ap24143	NCP	%	89		70-130	Pass	
TRH C6-C10	S19-Ap24143	NCP	%	102		70-130	Pass	



Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH >C10-C16	S19-Ap24145	NCP	%	71			70-130	Pass	
<b>Spike - % Recovery</b>									
<b>Polycyclic Aromatic Hydrocarbons</b>				Result 1					
Acenaphthene	M19-Ap29471	NCP	%	97			70-130	Pass	
Acenaphthylene	M19-Ap29471	NCP	%	99			70-130	Pass	
Anthracene	M19-Ap29471	NCP	%	101			70-130	Pass	
Benz(a)anthracene	M19-Ap29471	NCP	%	96			70-130	Pass	
Benzo(a)pyrene	M19-Ap29471	NCP	%	91			70-130	Pass	
Benzo(b&i)fluoranthene	M19-Ap29471	NCP	%	92			70-130	Pass	
Benzo(g,h,i)perylene	M19-Ap29471	NCP	%	87			70-130	Pass	
Benzo(k)fluoranthene	M19-Ap29471	NCP	%	86			70-130	Pass	
Chrysene	M19-Ap29471	NCP	%	99			70-130	Pass	
Dibenz(a,h)anthracene	M19-Ap29471	NCP	%	88			70-130	Pass	
Fluoranthene	M19-Ap29471	NCP	%	97			70-130	Pass	
Fluorene	M19-Ap29471	NCP	%	100			70-130	Pass	
Indeno(1,2,3-cd)pyrene	M19-Ap29471	NCP	%	100			70-130	Pass	
Naphthalene	M19-Ap29471	NCP	%	101			70-130	Pass	
Phenanthrene	M19-Ap29471	NCP	%	99			70-130	Pass	
Pyrene	M19-Ap29471	NCP	%	97			70-130	Pass	
<b>Spike - % Recovery</b>									
				Result 1					
Fluoride	M19-Ap04081	NCP	%	59			70-130	Fail	Q08
<b>Spike - % Recovery</b>									
<b>Heavy Metals</b>				Result 1					
Copper	S19-Ap24142	NCP	%	86			75-125	Pass	
Lead	S19-Ap24142	NCP	%	111			75-125	Pass	
Nickel	S19-Ap24142	NCP	%	75			75-125	Pass	
Zinc	S19-Ap24142	NCP	%	120			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			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	S19-Ap24142	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S19-Ap24144	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S19-Ap24144	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S19-Ap24144	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
<b>Duplicate</b>									
<b>BTEX</b>				Result 1	Result 2	RPD			
Benzene	S19-Ap24142	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S19-Ap24142	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S19-Ap24142	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S19-Ap24142	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S19-Ap24142	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S19-Ap24142	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
<b>Duplicate</b>									
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>				Result 1	Result 2	RPD			
Naphthalene	S19-Ap24142	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S19-Ap24142	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S19-Ap24144	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
<b>Duplicate</b>									
<b>Polycyclic Aromatic Hydrocarbons</b>				Result 1	Result 2	RPD			
Acenaphthene	M19-Ap26926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M19-Ap26926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M19-Ap26926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M19-Ap26926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Benzo(a)pyrene	M19-Ap26926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(b&j)fluoranthene	M19-Ap26926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(g,h,i)perylene	M19-Ap26926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(k)fluoranthene	M19-Ap26926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chrysene	M19-Ap26926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dibenz(a,h)anthracene	M19-Ap26926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluoranthene	M19-Ap26926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluorene	M19-Ap26926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	M19-Ap26926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Naphthalene	M19-Ap26926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Phenanthrene	M19-Ap26926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Pyrene	M19-Ap26926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
Fluoride	M19-Ma43493	NCP	mg/kg	< 100	< 100	<1	30%	Pass
% Moisture	S19-Ap23631	NCP	%	1.5	1.4	7.0	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Copper	S19-Ap24141	NCP	mg/kg	10	12	15	30%	Pass
Lead	S19-Ap24141	NCP	mg/kg	28	28	2.0	30%	Pass
Nickel	S19-Ap24141	NCP	mg/kg	7.7	9.4	20	30%	Pass
Zinc	S19-Ap24141	NCP	mg/kg	37	49	28	30%	Pass

## Comments

### Sample Integrity

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

### Qualifier Codes/Comments

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

## Authorised By

Andrew Black	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)
Julie Kay	Senior Analyst-Inorganic (VIC)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)



### Glenn Jackson General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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**Ramboll Environ Australia Pty Ltd**  
**Level 3/100 Pacific Highway**  
**North Sydney**  
**NSW 2060**



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**Site Number 18217**

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 The results of the tests, calibrations and/or  
 measurements included in this document are traceable  
 to Australian/national standards.

**Attention:** Jordyn Kirsch  
**Report** 651143-AID  
**Project Name** BUFFER ZONE REMEDIATION - MUNICIPAL LANDFILL  
**Project ID** 318000585  
**Received Date** Apr 15, 2019  
**Date Reported** Apr 24, 2019

**Methodology:**

Asbestos Fibre Identification

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.

*NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*

Unknown Mineral Fibres

Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity.

*NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*

Subsampling Soil Samples

The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter 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) is employed.

*NOTE: 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 for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination. The resultant material is then further examined in accordance with AS 4964 - 2004.

*NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*

Limit of Reporting

The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w).

The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk).

*NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos". This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

**Project Name**                    BUFFER ZONE REMEDIATION - MUNICIPAL LANDFILL  
**Project ID**                        318000585  
**Date Sampled**                  Apr 12, 2019  
**Report**                              651143-AID

Client Sample ID	Eurofins   mgt Sample No.	Date Sampled	Sample Description	Result
ML_VAL69	19-Ap23550	Apr 12, 2019	Approximate Sample 370g Sample consisted of: Brown fine-grained sandy soil	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected.  No respirable fibres detected.
TO3_120419	19-Ap23551	Apr 12, 2019	Approximate Sample 339g Sample consisted of: Brown fine-grained sandy soil	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected.  No respirable fibres 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 15, 2019	Indefinite

<b>Company Name:</b> Ramboll Australia Pty Ltd	<b>Order No.:</b>	<b>Received:</b> Apr 15, 2019 2:35 PM
<b>Address:</b> Level 3/100 Pacific Highway North Sydney NSW 2060	<b>Report #:</b> 651143	<b>Due:</b> Apr 24, 2019
	<b>Phone:</b> 02 9954 8118	<b>Priority:</b> 5 Day
	<b>Fax:</b> 02 9954 8150	<b>Contact Name:</b> Jordyn Kirsch
<b>Project Name:</b> BUFFER ZONE REMEDIATION - MUNICIPAL LANDFILL		
<b>Project ID:</b> 318000585		

**Eurofins | mgt Analytical Services Manager : Andrew Black**

Sample Detail						Asbestos - WA guidelines	Copper	Fluoride	Lead	Nickel	Zinc	Moisture Set	Eurofins   mgt Suite B4
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>							X	X	X	X	X	X	X
<b>Sydney Laboratory - NATA Site # 18217</b>						X							
<b>Brisbane Laboratory - NATA Site # 20794</b>													
<b>Perth Laboratory - NATA Site # 23736</b>													
<b>External Laboratory</b>													
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID								
1	ML_VAL69	Apr 12, 2019		Soil	S19-Ap23550	X	X	X	X	X	X	X	X
2	TO3_120419	Apr 12, 2019		Soil	S19-Ap23551	X	X	X	X	X	X	X	X
<b>Test Counts</b>						2	2	2	2	2	2	2	2

## 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>	Sample is dried by heating prior to analysis
<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>	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
<b>NEPM</b>	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
<b>ACM</b>	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
<b>AF</b>	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to "non-bonded / friable".
<b>FA</b>	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
<b>Friable</b>	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory's remit to assess degree of friability.
<b>Trace Analysis</b>	Analytical procedure used to detect the presence of respirable fibres in the matrix.



**Comments**

Samples received were 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

**Asbestos Counter/Identifier:**

Sayeed Abu Senior Analyst-Asbestos (NSW)

**Authorised by:**

Laxman Dias Senior Analyst-Asbestos (NSW)



**Glenn Jackson**  
**General Manager**

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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## APPENDIX 5 VALIDATION SAMPLING RESULTS

Sample Number	Sample Date	Sample ID	Project Name	Site	Sample Description	Units		REG														
						Units	LOR	ES1907251001	ES1907251002	ES1907251003	ES1907251004	ES1907251005	ES1907251007	ES1907251010	ES1907251011	ES1907251014	ES1907251016	ES1907251018				
				Municipal Landfill	SAND, fine grained, pale brown to yellow			1.3	3.8	7.2	6.3	4.3	5.1	6.7	8.3	10.3	7.3	9.3				
				Municipal Landfill	SAND, fine grained, pale brown/orange with grey																	
				Municipal Landfill	SAND, fine grained, pale brown/orange with grey																	
				Municipal Landfill	SAND, fine grained, pale brown/orange with grey																	
				Municipal Landfill	SAND, fine grained, pale brown																	
				Municipal Landfill	SAND, fine grained, pale brown																	
				Municipal Landfill	Gravelly SAND, fine grained, brown with grey/black mottling, medium sub-angular gravel																	
				Municipal Landfill	SAND, fine grained, pale brown																	
				Municipal Landfill	SAND, fine grained, pale brown																	
				Municipal Landfill	SAND, fine grained, brown, loamy, trace fine gravel																	
				Municipal Landfill	SAND, fine grained, pale brown/orange																	
<b>Analyte grouping/Analyte</b>																						
<b>Moisture Content</b>								%	1	1.3	3.8	7.2	6.3	4.3	5.1	6.7	8.3	10.3	7.3	9.3		
<b>EA200: AS 4964 - 2004 Identification of Asbestos in Soils</b>																						
Asbestos Detected								g/kg	0.1	No	No	No	No	No	No	No	No	No	No	No	No	
Asbestos (Trace)								g	5	No	No	No	No	No	No	No	No	No	No	No	No	No
Asbestos Type								--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Sample weight (dry)								g	0.01	11200	11300	8400	9550	10400	10000	11100	11300	11900	10800	12900		
Description								--	Mid brown soil	Mid brown soil	Mid brown soil	Mid brown soil	Mid brown soil	Mid brown soil	Mid brown soil	Mid brown soil	Mid brown soil	Mid brown soil	Mid brown soil	Mid brown soil		
APPROVED IDENTIFIER:								--	C.OWLER	C.OWLER	C.OWLER	C.OWLER	C.OWLER	C.OWLER	C.OWLER	C.OWLER	C.OWLER	C.OWLER	C.OWLER	C.OWLER		
<b>EA200: Asbestos Quantification (non-NATA)</b>																						
Asbestos Containing Material (as 15% Asbestos in ACM >7mm)								% (w/w)	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Asbestos (Fines and Fibrous < 7mm)								g	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004		
Asbestos (Fines and Fibrous FA+AF)								% (w/w)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
Weight Used for % Calculation								kg	0.0001	11.2	11.3	8.4	9.5	10.4	10	11.1	11.3	11.9	10.8	12.9		
Fibrous Asbestos > 7mm								g	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004			
Asbestos Containing Material								g	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
<b>EK001: Total Metals by ICP-AES</b>																						
Copper								mg/kg	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5		
Lead								mg/kg	5	<5	<5	<5	<5	<5	<5	<5	18	<5	18	6		
Nickel								mg/kg	2	<2	<2	3	<2	<2	3	<2	2	3	2	2		
Zinc								mg/kg	5	<5	<5	6	6	57	<5	26	31	<5	47	83		
<b>EK040: Fluoride Soluble</b>																						
Fluoride (SIM)B - Polynuclear Aromatic Hydrocarbons								mg/kg	1	<1	<1	<1	8	<1	<1	<1	8	<1	11	5		
<b>EPO75 (SIM)B - Polynuclear Aromatic Hydrocarbons</b>																						
Naphthalene								mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Acenaphthylene								mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Acenaphthene								mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Fluorene								mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Phenanthrene								mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Anthracene								mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Fluoranthene								mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Pyrene								mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Benz(a)anthracene								mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Chrysene								mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Benzo(b)fluoranthene								mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Benzo(k)fluoranthene								mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Benzo(a)pyrene								mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Indeno(1,2,3-cd)pyrene								mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Dibenz(a,h)anthracene								mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Benz(a)h)perylene								mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Sum of polycyclic aromatic hydrocarbons								mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Benzo(a)pyrene TEQ (zero)								mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Benzo(a)pyrene TEQ (half LOR)								mg/kg	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6		
Benzo(a)pyrene TEQ (LOR)								mg/kg	0.5	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2			
<b>EPO80/071: Total Petroleum Hydrocarbons</b>																						
C6 - C9 Fraction								mg/kg	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
C10 - C14 Fraction								mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50			
C15 - C28 Fraction								mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			
C29 - C36 Fraction								mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			
C10 - C36 Fraction (sum)								mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50			
<b>EPO80/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>																						
C6 - C10 Fraction								mg/kg	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10			
C6 - C10 Fraction minus BTEX (F1)								mg/kg	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10			
>C10 - C16 Fraction								mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50			
>C16 - C34 Fraction (F3)								mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			
>C34 - C40 Fraction (F4)								mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			
>C10 - C40 Fraction (sum)								mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50			
>C10 - C16 Fraction minus Naphthalene (F2)								mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50			
<b>EPO80: BTEXN</b>																						
Benzene								mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
Toluene								mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
Ethylbenzene								mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
meta- & para-Xylene								mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
ortho-Xylene								mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
Total Xylenes								mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
Sum of BTEX								mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2			
Naphthalene								mg/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1			

\* Site-specific recreational fluoride value calculated in the Preliminary Screening Level Health Risk Assessment for Fluoride and Aluminium (ENVIRON 2013)  
 † ELs were calculated using the average CEC 4.1 meq/100g, soil pH (6.5) and total organic carbon (0.9%) values from 13 soil samples collected from the Municipal Landfill during February 2013 investigation. The NEPM (2013) EIL Spreadsheet was used to generate the numbers and a site-specific ambient background concentration (ABC) was not included, rather a default ABC was used as calculated in the EIL calculator  
 ‡ Background fluoride concentration for Snelter Site and Buffer Zone lands  
 § Management limits are applied after consideration of relevant ESLs and HSLs.  
 ¶ Reported total fluoride concentration  
 Blank Cell indicates no criterion available  
 LOR = Limit of Reporting  
 National Environment Protection Council (2013) National Environmental Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1) (NEPM)  
 Concentrations in **italics** have adopted the higher duplicate value for a conservative approach  
 Concentration in **red font** and **grey box** exceed the adopted assessment criteria  
 Concentrations below the LOR noted as <value



Sample Type	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG			
Sample number	ES191107032	ES191107033	ES191107034	ES191107035	ES191107036	ES191107037	ES191107038	ES191107039	ES191107040	ES191107041	ES191107042	ES191107043	ES191107044	ES191107045	ES191107046	ES191107047	ES191107048	ES191107049	ES191107050	ES191107051			
Sample date	04-12-19	04-12-19	04-12-19	04-12-19	04-12-19	04-12-19	04-12-19	04-12-19	04-12-19	04-12-19	04-12-19	04-12-19	04-12-19	04-12-19	04-12-19	04-12-19	04-12-19	04-12-19	04-12-19	04-12-19	04-12-19		
Project ID	ML_VAL57	ML_VAL58	ML_VAL59	ML_VAL60	ML_VAL61	ML_VAL62	ML_VAL63	ML_VAL64	ML_VAL65	ML_VAL66	ML_VAL67	ML_VAL68	ML_VAL69	ML_VAL70	ML_VAL71	ML_VAL72	ML_VAL73	ML_VAL74	ML_VAL75	ML_VAL76	ML_VAL77		
Project Name	Buffer Zone Remediation	Buffer Zone Remediation	Buffer Zone Remediation	Buffer Zone Remediation	Buffer Zone Remediation	Buffer Zone Remediation	Buffer Zone Remediation	Buffer Zone Remediation	Buffer Zone Remediation	Buffer Zone Remediation	Buffer Zone Remediation	Buffer Zone Remediation	Buffer Zone Remediation	Buffer Zone Remediation	Buffer Zone Remediation	Buffer Zone Remediation	Buffer Zone Remediation	Buffer Zone Remediation	Buffer Zone Remediation	Buffer Zone Remediation	Buffer Zone Remediation	Buffer Zone Remediation	
Site	Municipal Landfill	Municipal Landfill	Municipal Landfill	Municipal Landfill	Municipal Landfill	Municipal Landfill	Municipal Landfill	Municipal Landfill	Municipal Landfill	Municipal Landfill	Municipal Landfill	Municipal Landfill	Municipal Landfill	Municipal Landfill	Municipal Landfill	Municipal Landfill	Municipal Landfill	Municipal Landfill	Municipal Landfill	Municipal Landfill	Municipal Landfill	Municipal Landfill	
Sample Description	SAND, medium to coarse grained, pale brown/orange with some gravel	SAND, fine grained, yellow	SAND, fine to medium grained, mottled orange/grey	SAND, fine to medium grained, pale brown with some orange	Silty SAND, medium grained, brown with gravel	SAND, medium grained, brown/orange	SAND, fine to medium grained, pale brown to yellow	Silty SAND, fine grained, grey	Silty SAND, fine grained, grey	Silty SAND, fine grained, grey	Silty SAND, fine grained, grey	SAND, coarse grained, yellow	Silty SAND, fine grained, grey	SAND, fine to medium grained	Silty SAND, fine to medium grained, grey/yellow	Gravelly SAND, medium to coarse grained, brown	SAND, coarse grained, yellow	SAND, fine grained, white					
Analyte grouping/Analyte	Units	LOR																					
Moisture Content	%	1	4.9	16.2	5.2	15.5	6.3	5.9	7.1	5.6	4.3	3.4	6.6	2.7	6.1	4.2	4.1	6.8	5.6			7.9	
EA200: AS 4964 - 2004 Identification of Asbestos in Soils																							
Asbestos Detected	g/kg	0.1	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	
Asbestos (Trace)	g	5	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	
Asbestos Type	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Sample weight (dry)	g	0.01	348	528	342	298	480	461	354	429	591	557	462	718	370	535	522	490	448	467			
Description	--	--	Mid brown sandy soil	Cream brown sandy soil	Light brown sandy soil	Light brown sandy soil	Mid brown sandy soil	Mid brown sandy soil	Mid brown sandy soil	Mid brown sandy soil	Cream sandy soil	Mid brown sandy soil	Cream brown sandy soil	Light brown sandy soil	Brown fine grained sandy soil	Light brown sandy soil	Light brown sandy soil	Light brown sandy soil	Light brown sandy soil	Light brown sandy soil	Cream sandy soil		
APPROVED IDENTIFIER:	--	--	A. SMYLLIE	A. SMYLLIE	A. SMYLLIE	A. SMYLLIE	A. SMYLLIE	A. SMYLLIE	A. SMYLLIE	A. SMYLLIE	A. SMYLLIE	A. SMYLLIE	A. SMYLLIE	A. SMYLLIE	S. Abu	A. SMYLLIE	A. SMYLLIE	A. SMYLLIE	A. SMYLLIE	A. SMYLLIE	A. SMYLLIE		
EA200N: Asbestos Quantification (non-NATA)																							
Asbestos Containing Material (as 15% Asbestos in ACM > 7mm)	% (w/w)	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Asbestos (Fines and Fibrous < 7mm)	% (w/w)	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004		
Asbestos (Fines and Fibrous FA + AF)	% (w/w)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
Weight Used for % Calculation	kg	0.0001	0.348	0.528	0.342	0.298	0.480	0.461	0.354	0.429	0.591	0.557	0.462	0.718	0.370	0.535	0.522	0.490	0.448	0.467			
Fibrous Asbestos > 7mm	g	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004		
Asbestos Containing Material	g	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
EK025T: Total Metals by ICP-AES																							
Copper	mg/kg	5	<5	<5	<5	29	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5		
Lead	mg/kg	5	6	<5	<5	26	<5	<5	<5	<5	<5	<5	13	<5	5.6	<5	<5	<5	<5	<5	<5		
Nickel	mg/kg	2	3	<2	2	<2	2	<2	<2	<2	<2	3	<2	4	<5	2	<2	2	4	<5	<2		
Zinc	mg/kg	5	35	8	8	34	43	<5	14	9	<5	<5	49	6	65	<5	<5	8	7	<5	104		
EK040S: Fluoride Soluble																							
Fluoride	mg/kg	1	<1	<1	<1	2	2	<1	<1	<1	<1	<1	1	<1	<100*	<1	<1	<1	<1	<1	<1		
EPO7S(SIMB): Polynuclear Aromatic Hydrocarbons																							
Naphthalene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Acenaphthylene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Acenaphthene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Fluorene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Phenanthrene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Anthracene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Fluoranthene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Pyrene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Benzo(a)anthracene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Chrysene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Benzo(b)fluoranthene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Benzo(a)pyrene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Indeno(1,2,3-cd)pyrene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Benzo(g,h,i)perylene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Sum of polycyclic aromatic hydrocarbons	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Benzo(a)pyrene TEQ (zero)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Benzo(a)pyrene TEQ (half LOR)	mg/kg	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6		
Benzo(a)pyrene TEQ (LOR)	mg/kg	0.5	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2		
EPO80/071: Total Petroleum Hydrocarbons																							
C6 - C9 Fraction	mg/kg	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<20	<10	<10	<10	<10	<10	<10		
C10 - C14 Fraction	mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
C15 - C28 Fraction	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<50	<100	<100	<100	<100	<100	<100		
C29 - C36 Fraction	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<50	<100	<100	<100	<100	<100	<100		
C10 - C36 Fraction (sum)	mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
EPO80/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions																							
C6 - C10 Fraction	mg/kg	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<20	<10	<10	<10	<10	<10	<10		
C6 -																							



**APPENDIX 6**  
**AIR MONITORING REPORTS**

# NATA ENDORSED AIR MONITORING REPORT



CLIENT: CMA Contracting  
Shane Botha  
2891 Pemberton Way  
KARRATHA WA 6714

LAB REPORT NO. N2989/298-301  
NAME & ADDRESS OF  
TESTING LABORATORY: Hazmat Services Pty Ltd  
Level 1, 45c Fitzroy Street  
CARRINGTON NSW 2294

SAMPLING LOCATION: Municipal Landfill Site, Hart Road, Loxford NSW

PROJECT DESCRIPTION: Control air monitoring during the excavation and loading out of landfill waste removed from the former municipal landfill.

TEST METHOD: In accordance with the Hazmat Services Pty Ltd Asbestos Procedures Manual and with reference to the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2<sup>nd</sup> Edition* [NOHSC:3003(2005)].

SAMPLING DATE: 1<sup>st</sup> March 2019 TIME ON: 08:00 TIME OFF: 15:06

Sample Identification	Sample Location	Count		Concentration
		Fibres	Field	Fibre/mL
N2989/H215/298	Eastern boundary of Asbestos Work Area	1.0	100	<0.01
N2989/H316/299	Northern-western boundary of Asbestos Work Area	2.0	100	<0.01
N2989/H321/300	Site office	1.5	100	<0.01
N2989/H385/301	North-eastern boundary of Asbestos Work Area	1.0	100	<0.01
N2989/H411/Bik	Field Blank	0.0	100	-



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Sampled By: Jeffrey Yu  
Counted By: Florence Archer  
Signatory: Florence Archer  
Senior Consultant - OHS&E  
Licensed Asbestos Assessor  
(2317104)

Issue Date: 1<sup>st</sup> March 2019  
Document No.: N2989\_NATA\_Endorsed\_Air\_Mon\_298-301\_010319



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# NATA ENDORSED AIR MONITORING REPORT



CLIENT: CMA Contracting  
Shane Botha  
2891 Pemberton Way  
KARRATHA WA 6714

LAB REPORT NO. N2989/302-305  
NAME & ADDRESS OF TESTING LABORATORY: Hazmat Services Pty Ltd  
Level 1, 45c Fitzroy Street  
CARRINGTON NSW 2294

SAMPLING LOCATION: Municipal Landfill Site, Hart Road, Loxford NSW

PROJECT DESCRIPTION: Control air monitoring during the excavation and loading out of landfill waste removed from the former municipal landfill.

TEST METHOD: In accordance with the Hazmat Services Pty Ltd Asbestos Procedures Manual and with reference to the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2<sup>nd</sup> Edition* [NOHSC:3003(2005)].

SAMPLING DATE: 4<sup>th</sup> March 2019      TIME ON: 07:45      TIME OFF: 15:31

Sample Identification	Sample Location	Count		Concentration
		Fibres	Field	Fibre/mL
N2989/H374/302	Eastern boundary of Asbestos Work Area	4.0	100	<0.01
N2989/H257/303	Site office	2.5	100	<0.01
N2989/H022/304	Northern boundary of Asbestos Work Area	2.0	100	<0.01
N2989/H048/305	Western boundary of Asbestos Work Area	3.0	100	<0.01
N2989/H364/Bik	Field Blank	0.0	100	-



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Issue Date: 5<sup>th</sup> March 2019

Document No.: N2989\_NATA\_Endorsed\_Air\_Mon\_302-305\_040319



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# NATA ENDORSED AIR MONITORING REPORT



CLIENT: CMA Contracting  
Shane Botha  
2891 Pemberton Way  
KARRATHA WA 6714

LAB REPORT NO. N2989/309-312  
NAME & ADDRESS OF TESTING LABORATORY: Hazmat Services Pty Ltd  
Level 1, 45c Fitzroy Street  
CARRINGTON NSW 2294

SAMPLING LOCATION: Municipal Landfill Site, Hart Road, Loxford NSW

PROJECT DESCRIPTION: Control air monitoring during the excavation and loading out of landfill waste removed from the former municipal landfill.

TEST METHOD: In accordance with the Hazmat Services Pty Ltd Asbestos Procedures Manual and with reference to the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2<sup>nd</sup> Edition* [NOHSC:3003(2005)].

SAMPLING DATE: 5<sup>th</sup> March 2019      TIME ON: 07:40      TIME OFF: 15:46

Sample Identification	Sample Location	Count		Concentration
		Fibres	Field	Fibre/mL
N2989/H510/309	South-eastern boundary of Asbestos Work Area	5.0	100	<0.01
N2989/H394/310	Site office	4.0	100	<0.01
N2989/H017/311	Western boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H118/312	Northern boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H530/Bik	Field Blank	0.0	100	-



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Issue Date: 6<sup>th</sup> March 2019

Document No.: N2989\_NATA\_Endorsed\_Air\_Mon\_309-312\_050319



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# NATA ENDORSED AIR MONITORING REPORT



CLIENT: CMA Contracting  
Shane Botha  
2891 Pemberton Way  
KARRATHA WA 6714

LAB REPORT NO. N2989/319-322  
NAME & ADDRESS OF TESTING LABORATORY: Hazmat Services Pty Ltd  
Level 1, 45c Fitzroy Street  
CARRINGTON NSW 2294

SAMPLING LOCATION: Municipal Landfill Site, Hart Road, Loxford NSW

PROJECT DESCRIPTION: Control air monitoring during the excavation and loading out of landfill waste removed from the former municipal landfill.

TEST METHOD: In accordance with the Hazmat Services Pty Ltd Asbestos Procedures Manual and with reference to the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2<sup>nd</sup> Edition* [NOHSC:3003(2005)].

SAMPLING DATE: 6<sup>th</sup> March 2019      TIME ON: 07:00      TIME OFF: 13:51

Sample Identification	Sample Location	Count		Concentration
		Fibres	Field	Fibre/mL
N2989/H412/319	South-eastern boundary of Asbestos Work Area	1.5	100	<0.01
N2989/H523/320	Site office	4.0	100	<0.01
N2989/H536/321	Western boundary of Asbestos Work Area	7.5	100	<0.01
N2989/H328/322	Northern boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H187/Bik	Field Blank	0.0	100	-



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Issue Date: 7<sup>th</sup> March 2019

Document No.: N2989\_NATA\_Endorsed\_Air\_Mon\_319-322\_060319



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# NATA ENDORSED AIR MONITORING REPORT



CLIENT: CMA Contracting  
Shane Botha  
2891 Pemberton Way  
KARRATHA WA 6714

LAB REPORT NO. N2989/332-335  
NAME & ADDRESS OF  
TESTING LABORATORY: Hazmat Services Pty Ltd  
Level 1, 45c Fitzroy Street  
CARRINGTON NSW 2294

SAMPLING LOCATION: Municipal Landfill Site, Hart Road, Loxford NSW

PROJECT DESCRIPTION: Control air monitoring during the excavation and loading out of landfill waste removed from the former municipal landfill.

TEST METHOD: In accordance with the Hazmat Services Pty Ltd Asbestos Procedures Manual and with reference to the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2<sup>nd</sup> Edition* [NOHSC:3003(2005)].

SAMPLING DATE: 7<sup>th</sup> March 2019 TIME ON: 07:00 TIME OFF: 16:14

Sample Identification	Sample Location	Count		Concentration
		Fibres	Field	Fibre/mL
N2989/H009/332	South-eastern boundary of Asbestos Work Area	1.0	100	<0.01
N2989/H335/333	Site office	0.0	100	<0.01
N2989/H308/334	Western boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H215/335	Northern boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H210/Bik	Field Blank	0.0	100	-



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Issue Date: 8<sup>th</sup> March 2019

Document No.: N2989\_NATA\_Endorsed\_Air\_Mon\_332-335\_070319



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# NATA ENDORSED AIR MONITORING REPORT



CLIENT: CMA Contracting  
Shane Botha  
2891 Pemberton Way  
KARRATHA WA 6714

LAB REPORT NO. N2989/342-345  
NAME & ADDRESS OF TESTING LABORATORY: Hazmat Services Pty Ltd  
Level 1, 45c Fitzroy Street  
CARRINGTON NSW 2294

SAMPLING LOCATION: Municipal Landfill Site, Hart Road, Loxford NSW

PROJECT DESCRIPTION: Control air monitoring during the excavation and loading out of landfill waste removed from the former municipal landfill.

TEST METHOD: In accordance with the Hazmat Services Pty Ltd Asbestos Procedures Manual and with reference to the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2<sup>nd</sup> Edition* [NOHSC:3003(2005)].

SAMPLING DATE: 8<sup>th</sup> March 2019      TIME ON: 07:00      TIME OFF: 15:20

Sample Identification	Sample Location	Count		Concentration
		Fibres	Field	Fibre/mL
N2989/H025/342	South-eastern boundary of Asbestos Work Area	1.0	100	<0.01
N2989/H186/343	Site office	0.0	100	<0.01
N2989/H537/344	Western boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H200/345	Northern boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H523/Bik	Field Blank	0.0	100	-



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Issue Date: 8<sup>th</sup> March 2019

Document No.: N2989\_NATA\_Endorsed\_Air\_Mon\_342-345\_080319



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# NATA ENDORSED AIR MONITORING REPORT



CLIENT: CMA Contracting  
Shane Botha  
2891 Pemberton Way  
KARRATHA WA 6714

LAB REPORT NO. N2989/352-355  
NAME & ADDRESS OF TESTING LABORATORY: Hazmat Services Pty Ltd  
Level 1, 45c Fitzroy Street  
CARRINGTON NSW 2294

SAMPLING LOCATION: Municipal Landfill Site, Hart Road, Loxford NSW

PROJECT DESCRIPTION: Control air monitoring during the excavation and loading out of landfill waste removed from the former municipal landfill.

TEST METHOD: In accordance with the Hazmat Services Pty Ltd Asbestos Procedures Manual and with reference to the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2<sup>nd</sup> Edition* [NOHSC:3003(2005)].

SAMPLING DATE: 11<sup>th</sup> March 2019      TIME ON: 07:00      TIME OFF: 15:46

Sample Identification	Sample Location	Count		Concentration
		Fibres	Field	Fibre/mL
N2989/H054/352	South-eastern boundary of Asbestos Work Area	1.5	100	<0.01
N2989/H276/353	Site office	1.0	100	<0.01
N2989/H341/354	Western boundary of Asbestos Work Area	3.0	100	<0.01
N2989/H399/355	Northern boundary of Asbestos Work Area	1.5	100	<0.01
N2989/H376/Blk	Field Blank	0.0	100	-



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Sampled By: Jeffrey Yu  
Counted By: Florence Archer  
Signatory: Florence Archer  
Senior Consultant - OHS&E  
Licensed Asbestos Assessor  
(2317104)

Issue Date: 12<sup>th</sup> March 2019

Document No.: N2989\_NATA\_Endorsed\_Air\_Mon\_352-355\_110319



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# NATA ENDORSED AIR MONITORING REPORT



CLIENT: CMA Contracting  
Shane Botha  
2891 Pemberton Way  
KARRATHA WA 6714

LAB REPORT NO. N2989/362-365  
NAME & ADDRESS OF TESTING LABORATORY: Hazmat Services Pty Ltd  
Level 1, 45c Fitzroy Street  
CARRINGTON NSW 2294

SAMPLING LOCATION: Municipal Landfill Site, Hart Road, Loxford NSW

PROJECT DESCRIPTION: Control air monitoring during the excavation and loading out of landfill waste removed from the former municipal landfill.

TEST METHOD: In accordance with the Hazmat Services Pty Ltd Asbestos Procedures Manual and with reference to the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2<sup>nd</sup> Edition* [NOHSC:3003(2005)].

SAMPLING DATE: 12<sup>th</sup> March 2019      TIME ON: 07:00      TIME OFF: 16:06

Sample Identification	Sample Location	Count		Concentration
		Fibres	Field	Fibre/mL
N2989/H501/362	South-eastern boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H301/363	Site office	0.0	100	<0.01
N2989/H395/364	Western boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H245/365	Northern boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H097/Bik	Field Blank	0.0	100	-



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Sampled By: Jeffrey Yu  
Counted By: Andrew Broadhurst  
Signatory: Andrew Broadhurst  
Senior Occupational Hygienist

Issue Date: 13<sup>th</sup> March 2019  
Document No.: N2989\_NATA\_Endorsed\_Air\_Mon\_362-365\_120319



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# NATA ENDORSED AIR MONITORING REPORT



CLIENT: CMA Contracting  
Shane Botha  
2891 Pemberton Way  
KARRATHA WA 6714

LAB REPORT NO. N2989/375-378  
NAME & ADDRESS OF TESTING LABORATORY: Hazmat Services Pty Ltd  
Level 1, 45c Fitzroy Street  
CARRINGTON NSW 2294

SAMPLING LOCATION: Municipal Landfill Site, Hart Road, Loxford NSW

PROJECT DESCRIPTION: Control air monitoring during the excavation and loading out of landfill waste removed from the former municipal landfill.

TEST METHOD: In accordance with the Hazmat Services Pty Ltd Asbestos Procedures Manual and with reference to the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2<sup>nd</sup> Edition* [NOHSC:3003(2005)].

SAMPLING DATE: 13<sup>th</sup> March 2019      TIME ON: 07:00      TIME OFF: 16:06

Sample Identification	Sample Location	Count		Concentration
		Fibres	Field	Fibre/mL
N2989/H376/375	South-eastern boundary of Asbestos Work Area	6.0	100	<0.01
N2989/H367/376	Site office	0.5	100	<0.01
N2989/H022/377	Western boundary of Asbestos Work Area	6.0	100	<0.01
N2989/H322/378	Northern boundary of Asbestos Work Area	4.0	100	<0.01
N2989/H009/Bik	Field Blank	0.0	100	-



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Sampled By: Jeffrey Yu  
Counted By: Jeffrey Yu  
Signatory: Dr. Jeffrey Yu  
Occupational Hygienist &  
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Licensed Asbestos Assessor  
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Jeffrey Huijie Yu  
于慧杰

Issue Date: 13<sup>th</sup> March 2019

Document No.: N2989\_NATA\_Endorsed\_Air\_Mon\_375-378\_130319



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# NATA ENDORSED AIR MONITORING REPORT



CLIENT: CMA Contracting  
Shane Botha  
2891 Pemberton Way  
KARRATHA WA 6714

LAB REPORT NO. N2989/385-388  
NAME & ADDRESS OF TESTING LABORATORY: Hazmat Services Pty Ltd  
Level 1, 45c Fitzroy Street  
CARRINGTON NSW 2294

SAMPLING LOCATION: Municipal Landfill Site, Hart Road, Loxford NSW

PROJECT DESCRIPTION: Control air monitoring during the excavation and loading out of landfill waste removed from the former municipal landfill.

TEST METHOD: In accordance with the Hazmat Services Pty Ltd Asbestos Procedures Manual and with reference to the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2<sup>nd</sup> Edition* [NOHSC:3003(2005)].

SAMPLING DATE: 14<sup>th</sup> March 2019      TIME ON: 07:00      TIME OFF: 16:06

Sample Identification	Sample Location	Count		Concentration
		Fibres	Field	Fibre/mL
N2989/H391/385	South-eastern boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H310/386	Site office	0.0	100	<0.01
N2989/H226/387	Western boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H017/388	Northern boundary of Asbestos Work Area	0.0	100	<0.01
N2989/B19/BIK	Field Blank	0.0	100	-



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Sampled By: Jeffrey Yu  
Counted By: Damien Hendrickx  
Signatory: Florence Archer  
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Licensed Asbestos Assessor  
(2317104)

Issue Date: 15<sup>th</sup> March 2019  
Document No.: N2989\_NATA\_Endorsed\_Air\_Mon\_385-388\_140319



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# NATA ENDORSED AIR MONITORING REPORT



CLIENT: CMA Contracting  
Shane Botha  
2891 Pemberton Way  
KARRATHA WA 6714

LAB REPORT NO. N2989/398-401  
NAME & ADDRESS OF TESTING LABORATORY: Hazmat Services Pty Ltd  
Level 1, 45c Fitzroy Street  
CARRINGTON NSW 2294

SAMPLING LOCATION: Municipal Landfill Site, Hart Road, Loxford NSW

PROJECT DESCRIPTION: Control air monitoring during the excavation and loading out of landfill waste removed from the former municipal landfill.

TEST METHOD: In accordance with the Hazmat Services Pty Ltd Asbestos Procedures Manual and with reference to the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2<sup>nd</sup> Edition* [NOHSC:3003(2005)].

SAMPLING DATE: 15<sup>th</sup> March 2019      TIME ON: 07:00      TIME OFF: 14:46

Sample Identification	Sample Location	Count		Concentration
		Fibres	Field	Fibre/mL
N2989/H108/398	South-eastern boundary of Asbestos Work Area	2.0	100	<0.01
N2989/H370/399	Site office	0.0	100	<0.01
N2989/H532/400	Western boundary of Asbestos Work Area	1.0	100	<0.01
N2989/H012/401	Northern boundary of Asbestos Work Area	0.5	100	<0.01
N2989/H388/Bik	Field Blank	0.0	100	-



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Sampled By: Jeffrey Yu  
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(2317104)

Issue Date: 15<sup>th</sup> March 2019  
Document No.: N2989\_NATA\_Endorsed\_Air\_Mon\_398-401\_150319



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# NATA ENDORSED AIR MONITORING REPORT



CLIENT: CMA Contracting  
Shane Botha  
2891 Pemberton Way  
KARRATHA WA 6714

LAB REPORT NO. N2989/411-414  
NAME & ADDRESS OF TESTING LABORATORY: Hazmat Services Pty Ltd  
Level 1, 45c Fitzroy Street  
CARRINGTON NSW 2294

SAMPLING LOCATION: Municipal Landfill Site, Hart Road, Loxford NSW

PROJECT DESCRIPTION: Control air monitoring during the excavation and loading out of landfill waste removed from the former municipal landfill.

TEST METHOD: In accordance with the Hazmat Services Pty Ltd Asbestos Procedures Manual and with reference to the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2<sup>nd</sup> Edition* [NOHSC:3003(2005)].

SAMPLING DATE: 18<sup>th</sup> March 2019      TIME ON: 07:08      TIME OFF: 15:14

Sample Identification	Sample Location	Count		Concentration
		Fibres	Field	Fibre/mL
N2989/H089/411	South-eastern boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H374/412	Site office	0.0	100	<0.01
N2989/H522/413	Western boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H017/414	Northern boundary of Asbestos Work Area	1.0	100	<0.01
N2989/H310/Bik	Field Blank	0.0	100	-



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Sampled By: Jeffrey Yu  
Counted By: Tim Grundy  
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OHS&E Technician  
Licensed Asbestos Assessor  
(LAA001323)

Issue Date: 19<sup>th</sup> March 2019

Document No.: N2989\_NATA\_Endorsed\_Air\_Mon\_411-414\_180319



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# NATA ENDORSED AIR MONITORING REPORT



CLIENT: CMA Contracting  
Shane Botha  
2891 Pemberton Way  
KARRATHA WA 6714

LAB REPORT NO. N2989/421-424  
NAME & ADDRESS OF TESTING LABORATORY: Hazmat Services Pty Ltd  
Level 1, 45c Fitzroy Street  
CARRINGTON NSW 2294

SAMPLING LOCATION: Municipal Landfill Site, Hart Road, Loxford NSW

PROJECT DESCRIPTION: Background air monitoring during the excavation and loading out of landfill waste removed from the former municipal landfill.

TEST METHOD: In accordance with the Hazmat Services Pty Ltd Asbestos Procedures Manual and with reference to the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2<sup>nd</sup> Edition* [NOHSC:3003(2005)].

SAMPLING DATE: 19<sup>th</sup> March 2019      TIME ON: 07:00      TIME OFF: 14:16

Sample Identification	Sample Location	Count		Concentration
		Fibres	Field	Fibre/mL
N2989/H243/421	South-eastern boundary of Asbestos Work Area	2.0	100	<0.01
N2989/H322/422	Site office	0.0	100	<0.01
N2989/H536/423	Western boundary of Asbestos Work Area	1.0	100	<0.01
N2989/H021/424	Northern boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H006/Bik	Field Blank	0.0	100	-



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Sampled By: Jeffrey Yu  
Counted By: Jeffrey Yu  
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Occupational Hygienist &  
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Jeffrey Huijie Yu  
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Issue Date: 19<sup>th</sup> March 2019

Document No.: N2989\_NATA\_Endorsed\_Air\_Mon\_421-424\_190319



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# NATA ENDORSED AIR MONITORING REPORT



CLIENT: CMA Contracting  
Shane Botha  
2891 Pemberton Way  
KARRATHA WA 6714

LAB REPORT NO. N2989/428-431  
NAME & ADDRESS OF  
TESTING LABORATORY: Hazmat Services Pty Ltd  
Level 1, 45c Fitzroy Street  
CARRINGTON NSW 2294

SAMPLING LOCATION: Municipal Landfill Site, Hart Road, Loxford NSW

PROJECT DESCRIPTION: Control air monitoring during the excavation and loading out of landfill waste removed from the former municipal landfill.

TEST METHOD: In accordance with the Hazmat Services Pty Ltd Asbestos Procedures Manual and with reference to the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2<sup>nd</sup> Edition* [NOHSC:3003(2005)].

SAMPLING DATE: 20<sup>th</sup> March 2019      TIME ON: 07:00      TIME OFF: 16:06

Sample Identification	Sample Location	Count		Concentration
		Fibres	Field	Fibre/mL
N2989/H083/428	South-eastern boundary of Asbestos Work Area	3.0	100	<0.01
N2989/H110/429	Site office	3.0	100	<0.01
N2989/H310/430	Western boundary of Asbestos Work Area	1.0	100	<0.01
N2989/H215/431	Northern boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H245/Bik	Field Blank	0.0	100	-



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Issue Date: 21<sup>st</sup> March 2019

Document No.: N2989\_NATA\_Endorsed\_Air\_Mon\_428-431\_200319



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# NATA ENDORSED AIR MONITORING REPORT



CLIENT: CMA Contracting  
Shane Botha  
2891 Pemberton Way  
KARRATHA WA 6714

LAB REPORT NO. N2989/435-438  
NAME & ADDRESS OF TESTING LABORATORY: Hazmat Services Pty Ltd  
Level 1, 45c Fitzroy Street  
CARRINGTON NSW 2294

SAMPLING LOCATION: Municipal Landfill Site, Hart Road, Loxford NSW

PROJECT DESCRIPTION: Control air monitoring during the excavation and loading out of landfill waste removed from the former municipal landfill.

TEST METHOD: In accordance with the Hazmat Services Pty Ltd Asbestos Procedures Manual and with reference to the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2<sup>nd</sup> Edition* [NOHSC:3003(2005)].

SAMPLING DATE: 21<sup>st</sup> March 2019      TIME ON: 07:00      TIME OFF: 16:46

Sample Identification	Sample Location	Count		Concentration
		Fibres	Field	Fibre/mL
N2989/H021/435	South-eastern boundary of Asbestos Work Area	2.0	100	<0.01
N2989/H388/436	Site office	0.5	100	<0.01
N2989/H525/437	Western boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H012/438	Northern boundary of Asbestos Work Area	1.0	100	<0.01
N2989/H006/Bik	Field Blank	0.0	100	-



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Issue Date: 22<sup>nd</sup> March 2019

Document No.: N2989\_NATA\_Endorsed\_Air\_Mon\_435-438\_210319



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# NATA ENDORSED AIR MONITORING REPORT



CLIENT: CMA Contracting  
Shane Botha  
2891 Pemberton Way  
KARRATHA WA 6714

LAB REPORT NO. N2989/448-451  
NAME & ADDRESS OF TESTING LABORATORY: Hazmat Services Pty Ltd  
Level 1, 45c Fitzroy Street  
CARRINGTON NSW 2294

SAMPLING LOCATION: Municipal Landfill Site, Hart Road, Loxford NSW

PROJECT DESCRIPTION: Control air monitoring during the excavation and loading out of landfill waste removed from the former municipal landfill.

TEST METHOD: In accordance with the Hazmat Services Pty Ltd Asbestos Procedures Manual and with reference to the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2<sup>nd</sup> Edition* [NOHSC:3003(2005)].

SAMPLING DATE: 22<sup>nd</sup> March 2019      TIME ON: 07:00      TIME OFF: 14:06

Sample Identification	Sample Location	Count		Concentration
		Fibres	Field	Fibre/mL
N2989/H017/448	South-eastern boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H397/449	Site office	0.0	100	<0.01
N2989/H083/450	Western boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H197/451	Northern boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H264/Bik	Field Blank	0.0	100	-



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Sampled By: Jeffrey Yu  
Counted By: Damien Hendrickx  
Signatory: Tim Grundy  
OHS&E Technician  
Licensed Asbestos Assessor  
(LAA001323)

Issue Date: 22<sup>nd</sup> March 2019

Document No.: N2989\_NATA\_Endorsed\_Air\_Mon\_448-451\_220319



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# NATA ENDORSED AIR MONITORING REPORT



CLIENT: CMA Contracting  
Shane Botha  
2891 Pemberton Way  
KARRATHA WA 6714

LAB REPORT NO. N2989/458-461  
NAME & ADDRESS OF TESTING LABORATORY: Hazmat Services Pty Ltd  
Level 1, 45c Fitzroy Street  
CARRINGTON NSW 2294

SAMPLING LOCATION: Municipal Landfill Site, Hart Road, Loxford NSW

PROJECT DESCRIPTION: Control air monitoring during the excavation and loading out of landfill waste removed from the former municipal landfill.

TEST METHOD: In accordance with the Hazmat Services Pty Ltd Asbestos Procedures Manual and with reference to the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2<sup>nd</sup> Edition* [NOHSC:3003(2005)].

SAMPLING DATE: 25<sup>th</sup> March 2019 TIME ON: 07:00 TIME OFF: 15:56

Sample Identification	Sample Location	Count		Concentration
		Fibres	Field	Fibre/mL
N2989/H321/458	South-eastern boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H398/459	Site office	0.0	100	<0.01
N2989/H525/460	Western boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H370/461	Northern boundary of Asbestos Work Area	1.0	100	<0.01
N2989/H388/Bik	Field Blank	0.0	100	-



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Issue Date: 25<sup>th</sup> March 2019

Document No.: N2989\_NATA\_Endorsed\_Air\_Mon\_458-461\_250319



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# NATA ENDORSED AIR MONITORING REPORT



CLIENT: CMA Contracting  
Shane Botha  
2891 Pemberton Way  
KARRATHA WA 6714

LAB REPORT NO. N2989/468-471  
NAME & ADDRESS OF  
TESTING LABORATORY: Hazmat Services Pty Ltd  
Level 1, 45c Fitzroy Street  
CARRINGTON NSW 2294

SAMPLING LOCATION: Municipal Landfill Site, Hart Road, Loxford NSW

PROJECT DESCRIPTION: Control air monitoring during the excavation and loading out of landfill waste removed from the former municipal landfill.

TEST METHOD: In accordance with the Hazmat Services Pty Ltd Asbestos Procedures Manual and with reference to the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2<sup>nd</sup> Edition* [NOHSC:3003(2005)].

SAMPLING DATE: 26<sup>th</sup> March 2019      TIME ON: 07:00      TIME OFF: 16:36

Sample Identification	Sample Location	Count		Concentration
		Fibres	Field	Fibre/mL
N2989/H282/468	South-eastern boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H376/469	Site office	0.0	100	<0.01
N2989/H186/470	Western boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H306/471	Northern boundary of Asbestos Work Area	1.5	100	<0.01
N2989/H537/Bik	Field Blank	0.0	100	-



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Sampled By: Jeffrey Yu  
Counted By: Andrew Broadhurst  
Signatory: Andrew Broadhurst  
Senior Occupational Hygienist –  
OHS&E

Issue Date: 27<sup>th</sup> March 2019

Document No.: N2989\_NATA\_Endorsed\_Air\_Mon\_468-471\_260319



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# NATA ENDORSED AIR MONITORING REPORT



CLIENT: CMA Contracting  
Shane Botha  
2891 Pemberton Way  
KARRATHA WA 6714

LAB REPORT NO. N2989/481-484  
NAME & ADDRESS OF TESTING LABORATORY: Hazmat Services Pty Ltd  
Level 1, 45c Fitzroy Street  
CARRINGTON NSW 2294

SAMPLING LOCATION: Municipal Landfill Site, Hart Road, Loxford NSW

PROJECT DESCRIPTION: Control air monitoring during the excavation and loading out of landfill waste removed from the former municipal landfill.

TEST METHOD: In accordance with the Hazmat Services Pty Ltd Asbestos Procedures Manual and with reference to the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2<sup>nd</sup> Edition* [NOHSC:3003(2005)].

SAMPLING DATE: 27<sup>th</sup> March 2019      TIME ON: 06:50      TIME OFF: 16:36

Sample Identification	Sample Location	Count		Concentration
		Fibres	Field	Fibre/mL
N2989/H215/481	South-eastern boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H335/482	Site office	0.0	100	<0.01
N2989/H273/483	Western boundary of Asbestos Work Area	1.0	100	<0.01
N2989/H372/484	Northern boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H352/Bik	Field Blank	0.0	100	-



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Sampled By: Jeffrey Yu  
Counted By: Jeffrey Yu  
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Issue Date: 27<sup>th</sup> March 2019  
Document No.: N2989\_NATA\_Endorsed\_Air\_Mon\_481-484\_270319



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# NATA ENDORSED AIR MONITORING REPORT



CLIENT: CMA Contracting  
Shane Botha  
2891 Pemberton Way  
KARRATHA WA 6714

LAB REPORT NO. N2989/491-494  
NAME & ADDRESS OF  
TESTING LABORATORY: Hazmat Services Pty Ltd  
Level 1, 45c Fitzroy Street  
CARRINGTON NSW 2294

SAMPLING LOCATION: Municipal Landfill Site, Hart Road, Loxford NSW

PROJECT DESCRIPTION: Control air monitoring during the excavation and loading out of landfill waste removed from the former municipal landfill.

TEST METHOD: In accordance with the Hazmat Services Pty Ltd Asbestos Procedures Manual and with reference to the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2<sup>nd</sup> Edition* [NOHSC:3003(2005)].

SAMPLING DATE: 28<sup>th</sup> March 2019      TIME ON: 07:00      TIME OFF: 16:06

Sample Identification	Sample Location	Count		Concentration
		Fibres	Field	Fibre/mL
N2989/H282/491	South-eastern boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H341/492	Site office	0.0	100	<0.01
N2989/H328/493	Western boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H391/494	Northern boundary of Asbestos Work Area	0.5	100	<0.01
N2989/H083/Bik	Field Blank	0.0	100	-



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Sampled By: Jeffrey Yu  
Counted By: Andrew Broadhurst  
Signatory: Andrew Broadhurst  
Senior Occupational Hygienist –  
OHS&E

Issue Date: 29<sup>th</sup> March 2019

Document No.: N2989\_NATA\_Endorsed\_Air\_Mon\_491-494\_280319



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www.hazmat-services.com.au



# NATA ENDORSED AIR MONITORING REPORT



CLIENT: CMA Contracting  
Shane Botha  
2891 Pemberton Way  
KARRATHA WA 6714

LAB REPORT NO. N2989/501-504  
NAME & ADDRESS OF  
TESTING LABORATORY: Hazmat Services Pty Ltd  
Level 1, 45c Fitzroy Street  
CARRINGTON NSW 2294

SAMPLING LOCATION: Municipal Landfill Site, Hart Road, Loxford NSW

PROJECT DESCRIPTION: Control air monitoring during the excavation and loading out of landfill waste removed from the former municipal landfill.

TEST METHOD: In accordance with the Hazmat Services Pty Ltd Asbestos Procedures Manual and with reference to the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2<sup>nd</sup> Edition* [NOHSC:3003(2005)].

SAMPLING DATE: 29<sup>th</sup> March 2019      TIME ON: 07:00      TIME OFF: 14:36

Sample Identification	Sample Location	Count		Concentration
		Fibres	Field	Fibre/mL
N2989/H021/501	South-eastern boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H215/502	Site office	0.0	100	<0.01
N2989/H274/503	Western boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H335/504	Northern boundary of Asbestos Work Area	0.5	100	<0.01
N2989/H095/Bik	Field Blank	0.0	100	-



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Counted By: Damien Hendrickx  
Signatory: Andrew Broadhurst  
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Issue Date: 29<sup>th</sup> March 2019

Document No.: N2989\_NATA\_Endorsed\_Air\_Mon\_501-504\_290319



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# NATA ENDORSED AIR MONITORING REPORT



CLIENT: CMA Contracting  
Shane Botha  
2891 Pemberton Way  
KARRATHA WA 6714

LAB REPORT NO. N2989/518-521  
NAME & ADDRESS OF TESTING LABORATORY: Hazmat Services Pty Ltd  
Level 1, 45c Fitzroy Street  
CARRINGTON NSW 2294

SAMPLING LOCATION: Municipal Landfill Site, Hart Road, Loxford NSW

PROJECT DESCRIPTION: Control air monitoring during the excavation and loading out of landfill waste removed from the former municipal landfill.

TEST METHOD: In accordance with the Hazmat Services Pty Ltd Asbestos Procedures Manual and with reference to the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2<sup>nd</sup> Edition* [NOHSC:3003(2005)].

SAMPLING DATE: 2<sup>nd</sup> April 2019 TIME ON: 07:00 TIME OFF: 15:51

Sample Identification	Sample Location	Count		Concentration
		Fibres	Field	Fibre/mL
N2989/H187/518	South-eastern boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H301/519	Site office	3.0	100	<0.01
N2989/H215/520	Western boundary of Asbestos Work Area	3.0	100	<0.01
N2989/H253/521	Northern boundary of Asbestos Work Area	1.0	100	<0.01
N2989/H360/Bik	Field Blank	0.0	100	-



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Sampled By: Jeffrey Yu  
Counted By: Jeffrey Yu  
Signatory: Andrew Broadhurst  
Senior Occupational Hygienist –  
OHS&E

Issue Date: 2<sup>nd</sup> April 2019

Document No.: N2989\_NATA\_Endorsed\_Air\_Mon\_518-521\_020419



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# NATA ENDORSED AIR MONITORING REPORT



CLIENT: CMA Contracting  
Shane Botha  
2891 Pemberton Way  
KARRATHA WA 6714

LAB REPORT NO. N2989/525-528  
NAME & ADDRESS OF  
TESTING LABORATORY: Hazmat Services Pty Ltd  
Level 1, 45c Fitzroy Street  
CARRINGTON NSW 2294

SAMPLING LOCATION: Municipal Landfill Site, Hart Road, Loxford NSW

PROJECT DESCRIPTION: Control air monitoring during the excavation and loading out of landfill waste removed from the former municipal landfill.

TEST METHOD: In accordance with the Hazmat Services Pty Ltd Asbestos Procedures Manual and with reference to the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2<sup>nd</sup> Edition* [NOHSC:3003(2005)].

SAMPLING DATE: 3<sup>rd</sup> April 2019      TIME ON: 07:10      TIME OFF: 16:16

Sample Identification	Sample Location	Count		Concentration
		Fibres	Field	Fibre/mL
N2989/H006/525	South-eastern boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H411/526	Site office	0.0	100	<0.01
N2989/H507/527	Western boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H521/528	Northern boundary of Asbestos Work Area	1.5	100	<0.01
N2989/H204/Bik	Field Blank	0.0	100	-



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Sampled By: Jeffrey Yu  
Counted By: Damien Hendrickx  
Signatory: Andrew Broadhurst  
Senior Occupational Hygienist –  
OHS&E

Issue Date: 4<sup>th</sup> April 2019  
Document No.: N2989\_NATA\_Endorsed\_Air\_Mon\_525-528\_030419



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# NATA ENDORSED AIR MONITORING REPORT



CLIENT: CMA Contracting  
Shane Botha  
2891 Pemberton Way  
KARRATHA WA 6714

LAB REPORT NO. N2989/532-535  
NAME & ADDRESS OF TESTING LABORATORY: Hazmat Services Pty Ltd  
Level 1, 45c Fitzroy Street  
CARRINGTON NSW 2294

SAMPLING LOCATION: Municipal Landfill Site, Hart Road, Loxford NSW

PROJECT DESCRIPTION: Control air monitoring during the excavation and loading out of landfill waste removed from the former municipal landfill.

TEST METHOD: In accordance with the Hazmat Services Pty Ltd Asbestos Procedures Manual and with reference to the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2<sup>nd</sup> Edition* [NOHSC:3003(2005)].

SAMPLING DATE: 4<sup>th</sup> April 2019      TIME ON: 07:10      TIME OFF: 15:46

Sample Identification	Sample Location	Count		Concentration
		Fibres	Field	Fibre/mL
N2989/H340/532	South-eastern boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H527/533	Site office	0.0	100	<0.01
N2989/H322/534	Western boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H367/535	Northern boundary of Asbestos Work Area	1.0	100	<0.01
N2989/H526/Blk	Field Blank	0.0	100	-



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Sampled By: Jeffrey Yu  
Counted By: Tim Grundy  
Signatory: Tim Grundy  
OHS&E Technician  
Licensed Asbestos Assessor  
(LAA001323)

Issue Date: 5<sup>th</sup> April 2019

Document No.: N2989\_NATA\_Endorsed\_Air\_Mon\_532-535\_040419



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# NATA ENDORSED AIR MONITORING REPORT



CLIENT: CMA Contracting  
Shane Botha  
2891 Pemberton Way  
KARRATHA WA 6714

LAB REPORT NO. N2989/539-542  
NAME & ADDRESS OF TESTING LABORATORY: Hazmat Services Pty Ltd  
Level 1, 45c Fitzroy Street  
CARRINGTON NSW 2294

SAMPLING LOCATION: Municipal Landfill Site, Hart Road, Loxford NSW

PROJECT DESCRIPTION: Control air monitoring during the excavation and loading out of landfill waste removed from the former municipal landfill.

TEST METHOD: In accordance with the Hazmat Services Pty Ltd Asbestos Procedures Manual and with reference to the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2<sup>nd</sup> Edition* [NOHSC:3003(2005)].

SAMPLING DATE: 5<sup>th</sup> April 2019 TIME ON: 07:00 TIME OFF: 15:06

Sample Identification	Sample Location	Count		Concentration
		Fibres	Field	Fibre/mL
N2989/H382/539	South-eastern boundary of Asbestos Work Area	2.0	100	<0.01
N2989/H200/540	Site office	1.0	100	<0.01
N2989/H108/541	Western boundary of Asbestos Work Area	0.0	100	<0.01
N2989/H533/542	Northern boundary of Asbestos Work Area	1.5	100	<0.01
N2989/H187/Bik	Field Blank	0.0	100	-



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Sampled By: Jeffrey Yu  
Counted By: Damien Hendrickx  
Signatory: Andrew Broadhurst  
Senior Occupational Hygienist –  
OHS&E

Issue Date: 7<sup>th</sup> April 2019

Document No.: N2989\_NATA\_Endorsed\_Air\_Mon\_539-542\_050419



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**APPENDIX 7**  
**ASBESTOS CLEARANCE CERTIFICATES**



# HAZMAT SERVICES

28 March 2019

Our Ref: N2989\_CLR\_R0\_MUNICIPAL LANDFILL(WEST)\_280319

Shane Botha  
Project Manager  
CMA Contracting  
2891 Pemberton Way  
KARRATHA WA 6714

Dear Shane

## ASBESTOS CLEARANCE INSPECTIONS – LOT 435, 436 AND 437 IN DP755231 – MUNICIPAL LANDFILL (WEST) HART ROAD, LOXFORD NSW

On the 1<sup>st</sup> of March 2019, at your request, Hazmat Services Pty Ltd ("Hazmat") was engaged to undertake control air monitoring during and visual clearance inspections following the removal of asbestos contaminated soils from the western section (mainly locating within Lot 437 in DP755231) of the Municipal Landfill (the "Asbestos Work Areas"), at Hart Road, Loxford NSW (the "Site") before reinstatement with clean fill in order to proceed to the removal of the eastern section of the Municipal Landfill.

### 1 BACKGROUND

A Remedial Action Plan ("RAP") was prepared by Ramboll (Report Ref: AS130418\_Municipal Landfill\_RAP\_Final.pdf) for the remediation of asbestos contamination at the Municipal Landfill associated with the former Hydro Aluminium Smelter located at Kurri Kurri NSW.

Hazmat understands the Site is zoned Rural Landscape (RU2) under the Cessnock Local Environment Plan 2011. Historically, the local council operated a municipal landfill (the "Municipal Landfill") by infilling a gully on the Site with municipal wastes including glass, ceramic, bricks, metal, wire, asbestos-contaminated material ("ACM") fragments, paper, plastic, 200 litre drums and cars. An evaluation of the soil identified impacts in the form of lead, benzo(a)pyrene and asbestos. The preferred remedial strategy contained within the RAP was the remediation of landfill materials and associated impacted soils to be relocated to the Smelter Site and then incorporated within a whole-of-site remediation strategy.

CMA Contracting (the "Client") engaged Aztech Services ("Aztech"), a Class A licensed asbestos removal contractor to undertake the asbestos remediation works at the Site.

Hazmat was engaged by the Client to provide control air monitoring during, and visual clearance inspections following the asbestos remediation work.

The asbestos remediation works included the removal of the filled materials, followed by handpicking of any surficial ACM fragments sighted on the surfaces of the residual soils.

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## 2 CONTROL AIR MONITORING

Control air monitoring was undertaken at the boundaries of the Asbestos Work Areas during the asbestos remediation works on 1<sup>st</sup>, 4<sup>th</sup>, 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup>, 8<sup>th</sup>, 11<sup>th</sup>, 12<sup>th</sup>, 14<sup>th</sup>, 15<sup>th</sup>, 18<sup>th</sup>, 19<sup>th</sup>, 20<sup>th</sup>, 21<sup>st</sup>, 22<sup>nd</sup>, 25<sup>th</sup>, 26<sup>th</sup>, 27<sup>th</sup> and 28<sup>th</sup> of March 2019.

'Action Levels' are documented in Section 3.11 of the *Code of Practice: How to Safely Remove Asbestos 2018* ("Code of Practice") and are airborne asbestos fibre concentrations which, if exceeded, indicate there is a need to review current control measures or take other action. These 'Action Levels' are occupational hygiene 'best practice', are not health-based standards.

Control air monitoring was undertaken whenever asbestos removal work was in progress. All air monitoring was carried out by Hazmat to National Association of Testing Authorities, Australia ("NATA") standards and in accordance with the Code of Practice and the "Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2<sup>nd</sup> Edition [NOHSC:3003 (2005)]" (the "Membrane Filter Method").

The results of the control air monitoring were all below 0.01 fibres per millilitre of air (" $<0.01$  Fibres/mL") which is below the limit of detection using the Membrane Filter Method and within acceptable 'Action Levels' of  $<0.01$  fibre/mL as stated in Section 3.11 of the Code of Practice. These results indicate that the asbestos controls were adequate and asbestos control measures were effective throughout the project.

The NATA endorsed control air monitoring reports have been issued to the Client.

## 3 VISUAL CLEARANCE INSPECTIONS

The visual clearance inspections were undertaken within the nominated Asbestos Work Areas only, at the completion of the following asbestos remediation works:

- Removal of asbestos contaminated waste buried in the western section of the Municipal Landfill;
- A mechanical excavation of the filled materials within the gully and surrounding sections of the Municipal Landfill; and
- Handpicking of any surficial ACM fragments sighted on the top surfaces of the residual soils within the gully and the edges of the Municipal Landfill.

Photographic record of the areas included in the visual clearance inspections following the asbestos remediation works are contained in Attachment A: Photographic Record.

A Site Layout Plan showing the remediated and validated sections of the western section of the Municipal Landfill is contained in Attachment B: Site Layout Plan.

The purpose of the visual clearance inspections was to assess whether all visible and accessible ACM had been removed to a satisfactory standard in accordance with the requirements of the Code of Practice.

The visual clearance inspections carried out by Hazmat's Jeffery Yu, Licensed Asbestos Assessor (LAA001366) on the 28<sup>th</sup> of March 2019 found that the asbestos remediation works were completed to a satisfactory standard and no visible asbestos-containing debris was sighted to the accessible surfaces of the Asbestos Work Areas inspected.

The visual clearance inspections have been completed in accordance with and to the standard contemplated in Section 3.10 of the Code of Practice prior to the re-occupation of an Asbestos Work Area taking place and were undertaken in sections that were visibly accessible at the time of the inspection.

Materials that may have been concealed during the inspections including in areas that were physically inaccessible, beneath other surfaces, the surface of the ground and in adjacent areas, but become exposed due to exposure to the elements or during other works and are suspected of containing asbestos, should have their composition determined prior to works in those areas continuing. For example, forming a part of the road base, the windrow along the northern side/edge of the gully could be overturned during the subsequent site activities and possibly expose ACM. Unexpected finds when identified during the site activities, would require further remediation under controlled asbestos removal conditions (raking, handpicking or scrapping) by a Class A Licenced Asbestos Removal Contractor.

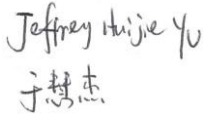
The visual clearance inspections conducted by Hazmat are to the standard contemplated in the Code of Practice but are by their nature not intended or able to certify that removal of all asbestos from the Site has occurred.

#### 4 SUMMARY OF CLEARANCE

The visual clearance inspections conducted on the 28<sup>th</sup> of March 2019 by Hazmat's Jeffrey Yu confirmed that the asbestos removal works associated with the Asbestos Work Section sat the Site were completed and the sections are fit for re-use.

Please do not hesitate to contact our Carrington office on (02) 4961 1887 if you require any additional information or assistance.

Yours sincerely  
Hazmat Services Pty Ltd



于慧杰

Dr. Jeffrey Yu  
OCCUPATIONAL HYGIENIST & ENVIRONMENTAL  
CONSULTANT  
LICENCED ASBESTOS ASSESSOR (LAA001366)



Rosalie Mayo-Ramsay  
PRINCIPAL CONSULTANT – HAZMAT & OHS  
LICENSED ASBESTOS ASSESSOR (LAA001004)  
QC REVIEWER

Encl: *Photographic Record, Site Layout Plan and Limitations*

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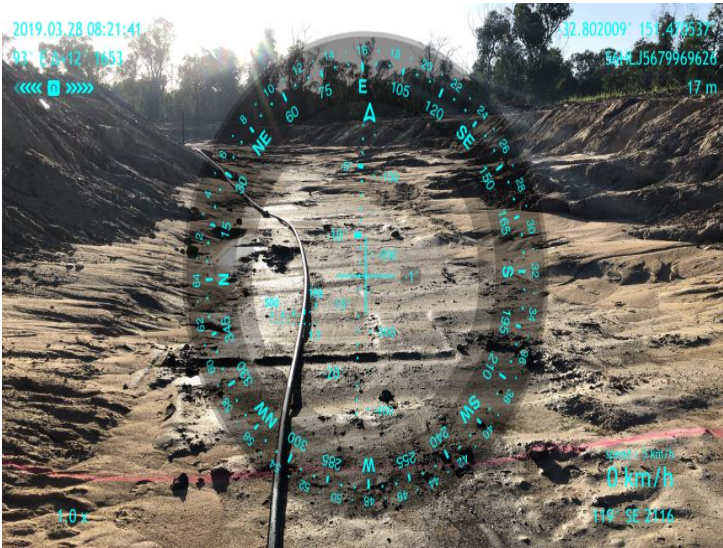
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ATTACHMENTS



## ATTACHMENT A: PHOTOGRAPHIC RECORD



Photograph 1

Western section of the Municipal Landfill with GPS locations

View of ground surfaces within the gully (facing west direction) following the removal asbestos contaminated soil, mechanical excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on 28<sup>th</sup> March 2019.

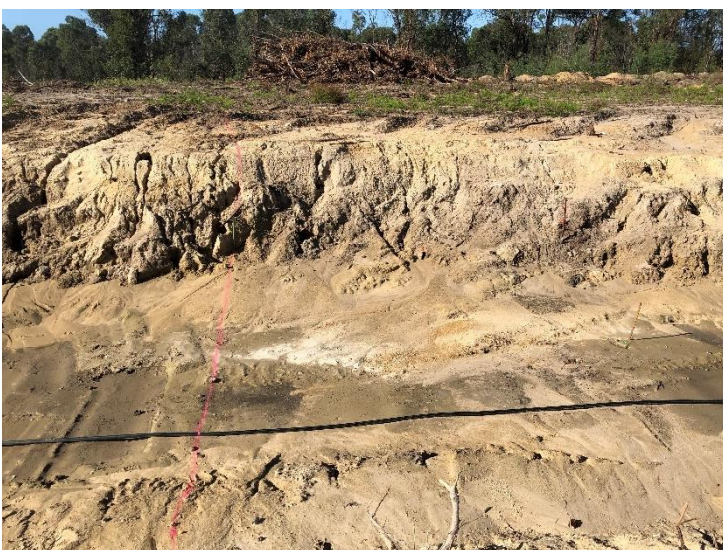


Photograph 2

Western section of the Municipal Landfill

View of ground surfaces within the gully (facing west direction) following the removal asbestos contaminated soil, mechanical excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on 28<sup>th</sup> March 2019.



Photograph 3

Western section of the Municipal Landfill

View of ground surfaces on the north edge of the gully (facing south direction) following the removal asbestos contaminated soil, mechanical excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on 28<sup>th</sup> March 2019.



Photograph 4

Western section of the Municipal Landfill

View of ground surfaces on the northern edge of the gully (facing north direction) following the removal asbestos contaminated soil, mechanical excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on 28<sup>th</sup> March 2019.



Photograph 5

Western section of the Municipal Landfill

View of ground surfaces on the northern edge of the gully (facing west direction) following the removal asbestos contaminated soil, mechanical excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on 28<sup>th</sup> March 2019.



Photograph 6

The middle of the Western section of the Municipal Landfill

View of ground surfaces within the gully (facing west direction) following the removal asbestos contaminated soil, mechanical excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on 28<sup>th</sup> March 2019.



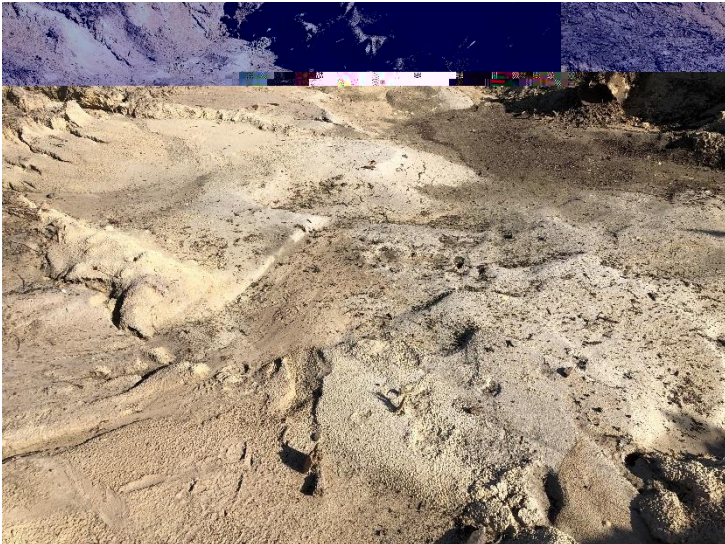


Photograph 7

The middle pit of the Western section of the Municipal Landfill

View of ground surfaces within the gully (facing south direction) following the removal asbestos contaminated soil, mechanical excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on 28<sup>th</sup> March 2019.



Photograph 8

The middle pit of the Western section of the Municipal Landfill

View of ground surfaces within the middle pit (facing north direction) following the removal asbestos contaminated soil, mechanical excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on 28<sup>th</sup> March 2019.



Photograph 9

The Eastern gully of the Western section of the Municipal Landfill

View of ground surfaces on the southern edge of the gully (facing east direction) following the removal asbestos contaminated soil, mechanical excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on 28<sup>th</sup> March 2019.

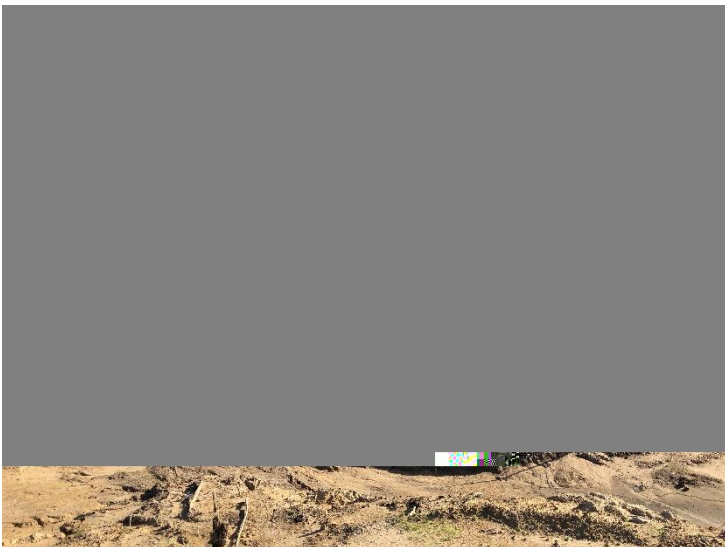


Photograph 10

The end of the Western section of the Municipal Landfill

View of ground surfaces within the gully end (facing east direction) following the removal asbestos contaminated soil, mechanical excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on 28<sup>th</sup> March 2019.



Photograph 11

The end of the Western section of the Municipal Landfill

View of ground surfaces out of the gully (facing north direction) following the removal asbestos contaminated soil, mechanical excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on 28<sup>th</sup> March 2019.



Photograph 12

The western pit of the Western section of the Municipal Landfill

View of ground surfaces out of the gully (facing south direction) following the removal asbestos contaminated soil, mechanical excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on 28<sup>th</sup> March 2019.



Photograph 13

The western pit of the Western section of the Municipal Landfill

View of ground surfaces out of the gully (facing west direction) following the removal asbestos contaminated soil, mechanical excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on 28<sup>th</sup> March 2019.



Photograph 14

The adjacent section of the Western section of the Municipal Landfill

View of ground surfaces out of the gully (facing north direction) following the removal asbestos contaminated soil, mechanical excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on 28<sup>th</sup> March 2019.



ATTACHMENT B: SITE LAYOUT PLAN



**LEGEND**



Site Boundary



Asbestos Work Areas – Municipal Landfill (West)



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SERVICES**

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Title: Lot 435, 436, 437 in DP755231, Municipal Landfill (West), Hart Road, Loxford

Figure:

1

Project No:

N2989

Date:

28/03/2019

Revision:

0



## ATTACHMENT C: LIMITATIONS

## LIMITATIONS

Materials which were concealed or not included as part of our scope of work but become exposed during demolition or other works and are suspected of containing asbestos or other hazardous materials should have their composition determined prior to works in those sections continuing.

Hazmat acknowledges that this report may be used as or form part of Hydro Aluminium Kurri Kurri's site environmental validation documentation.

Hazmat has prepared this report for the purpose set out above. Because this report has been prepared for that purpose, it is not appropriate for this report to be used for any other purpose, without our prior written consent. It is also not appropriate for this report to be released to any other party (either in whole or in part) without Hazmat's prior written consent. Should you wish to use this report for a purpose other than the purpose for which it was prepared, or to release this report (either in whole or in part) to any other party, please contact Hazmat so that we may discuss your wishes in further detail with you.

Please note, however, that in the event this report is used for a purpose for which it was not prepared, and you have not obtained our prior written consent to use the report for that purpose, then neither Hazmat, nor any member or employee of Hazmat, accept responsibility or liability for the use of this report for that purpose.

In addition, this report does not, and does not purport to, give legal advice as to your actual or potential asbestos or hazardous material liabilities, or draw conclusions as to whether any particular circumstances constitute a breach of relevant legislation. You will appreciate that this advice can only be given by qualified legal practitioners.

Finally, Hazmat does not make any other warranty, expressed or implied, as to the professional advice contained in this report.



# HAZMAT SERVICES

10 April 2019

Our Ref: N2989\_CLR\_R0\_MUNICIPAL LANDFILL(EAST)\_100419

Shane Botha  
Project Manager  
CMA Contracting  
2891 Pemberton Way  
KARRATHA WA 6714

Dear Shane

## ASBESTOS CLEARANCE INSPECTIONS – LOT 435, 436 AND 437 IN DP755231 – MUNICIPAL LANDFILL (EAST) HART ROAD, LOXFORD NSW

On the 9<sup>th</sup> and 10<sup>th</sup> of April 2019, at your request, Hazmat Services Pty Ltd ("Hazmat") was engaged to undertake control air monitoring during and visual clearance inspections following the removal of asbestos contaminated soils from the eastern section (mainly locating within Lot 435 and Lot 436 in DP755231) of the landfill (the "Asbestos Work Sections"), at Hart Road, Loxford NSW (the "Site").

### 1 BACKGROUND

A Remedial Action Plan ("RAP") was prepared by Ramboll (Report Ref: AS130418\_Municipal Landfill\_RAP\_Final.pdf) for the remediation of asbestos contamination at the Municipal Landfill associated with the former Hydro Aluminium Smelter located at Kurri Kurri NSW.

Hazmat understands the Site is zoned Rural Landscape (RU2) under the Cessnock Local Environment Plan 2011. Historically, the local council operated a municipal landfill (the "Municipal Landfill") by infilling a gully on the Site with municipal wastes including glass, ceramic, bricks, metal, wire, asbestos-contaminated material ("ACM") fragments, paper, plastic, 200 litre drums and cars. An evaluation of the soil identified impacts in the form of lead, benzo(a)pyrene and asbestos. The preferred remedial strategy contained within the RAP was the remediation of landfill materials and associated impacted soils to be relocated to the Smelter Site and then incorporated within a whole-of-site remediation strategy.

CMA Contracting (the "Client") engaged Aztech Services ("Aztech"), a Class A licensed asbestos removal contractor to undertake the asbestos remediation works at the Site.

Hazmat was engaged by the Client to provide control air monitoring during, and visual clearance inspections following the asbestos remediation work.

The asbestos remediation works included the removal of the filled materials, followed by handpicking of any surficial asbestos fragments sighted on the surfaces of the residual soils.

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## 2 CONTROL AIR MONITORING

Control air monitoring was undertaken at the boundaries of the Asbestos Work Sections during the asbestos removal works on 1<sup>st</sup>, 4<sup>th</sup>, 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup>, 8<sup>th</sup>, 11<sup>th</sup>, 12<sup>th</sup>, 14<sup>th</sup>, 15<sup>th</sup>, 18<sup>th</sup>, 19<sup>th</sup>, 20<sup>th</sup>, 21<sup>st</sup>, 22<sup>nd</sup>, 25<sup>th</sup>, 26<sup>th</sup>, 27<sup>th</sup> and 28<sup>th</sup> of March, 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> of April 2019.

'Action Levels' are documented in Section 3.11 of the *Code of Practice: How to Safely Remove Asbestos 2018* ("Code of Practice") and are airborne asbestos fibre concentrations which, if exceeded, indicate there is a need to review current control measures or take other action. These 'Action Levels' are occupational hygiene 'best practice', are not health-based standards.

Control air monitoring was undertaken whenever asbestos removal work was in progress. All air monitoring was carried out by Hazmat to National Association of Testing Authorities, Australia ("NATA") standards and in accordance with the Code of Practice and the "*Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2<sup>nd</sup> Edition* [NOHSC:3003 (2005)]" (the "Membrane Filter Method").

The results of the control air monitoring were all below 0.01 fibres per millilitre of air (<0.01 Fibres/mL) which is below the limit of detection using the Membrane Filter Method and within acceptable 'Action Levels' of <0.01 fibre/mL as stated in Section 3.11 of the Code of Practice. These results indicate that the asbestos controls were adequate and asbestos control measures were effective throughout the project.

The NATA endorsed control air monitoring reports have been issued to the Client.

## 3 VISUAL CLEARANCE INSPECTIONS

The visual clearance inspections were undertaken within the nominated Asbestos Work Sections only, at the completion of the following asbestos remediation works:

- Removal of asbestos contaminated waste buried in the eastern section of the landfill;
- A mechanical scrape and excavation of the filled materials within the gully and surrounding sections of the landfill; and
- Handpicking of any surficial asbestos fragments sighted on the top surfaces of the residual soils within the gully and the edges.

Photographic record of the section included in the visual clearance inspections following the removal of ACM are contained in Attachment A: Photographic Record.

A Site Layout Plan showing the remediated and validated sections of the eastern section is contained in Attachment B: Site Layout Plan.

The purpose of the visual clearance inspections were to assess whether all visible and accessible ACM had been removed to a satisfactory standard in accordance with the requirements of the Code of Practice.

The visual clearance inspections carried out by Hazmat's Jeffery Yu, Licensed Asbestos Assessor (LAA001366) on the 10<sup>th</sup> of April 2019 found that the asbestos remediation works were completed to a satisfactory standard and no visible asbestos-containing debris was sighted to the accessible surfaces of the Asbestos Work Areas inspected.

The visual clearance inspections have been completed in accordance with and to the standard contemplated in Section 3.10 of the Code of Practice prior to the re-occupation of an Asbestos Work Section taking place and were undertaken in sections that were visibly accessible at the time of the inspection.

Materials that may have been concealed during the inspections including in sections that were physically inaccessible, beneath other surfaces, the surface of the ground and in adjacent sections, that may become exposed due to exposure to the elements or during other works and are suspected of containing asbestos, should have their composition determined prior to works in those sections continuing. For example, forming a part of the road base, the soil along the northern side/edge of the gully could be overturned during the subsequent site activities and possibly expose ACM. Unexpected finds when identified during the site activities, would require further removal under controlled ACM removal procedures (raking, handpicking or scrapping) by a class A Licenced Asbestos Removal Contractor.

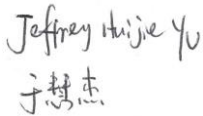
The visual clearance inspections conducted by Hazmat are to the standard contemplated in the Code of Practice but are by their nature not intended or able to certify that removal of all asbestos from the Site has occurred.

#### 4 SUMMARY OF CLEARANCE

The visual clearance inspection conducted on the 9<sup>th</sup> and 10<sup>th</sup> of April 2019 by Hazmat's Jeffrey Yu confirmed that the asbestos removal works associated with the Asbestos Work Section sat the Site were completed and the sections are fit for re-use.

Please do not hesitate to contact our Carrington office on (02) 4961 1887 if you require any additional information or assistance.

Yours sincerely  
Hazmat Services Pty Ltd



于慧杰

Dr. Jeffrey Yu  
OCCUPATIONAL HYGIENIST & ENVIRONMENTAL  
CONSULTANT  
LICENCED ASBESTOS ASSESSOR (LAA001366)



Rosalie Mayo-Ramsay  
PRINCIPAL CONSULTANT – HAZMAT & OHS  
LICENSED ASBESTOS ASSESSOR (LAA001004)  
QC REVIEWER

Encl: NATA Endorsed Control Air Monitoring Report, Photographic Record, Site Layout Plan and Limitations

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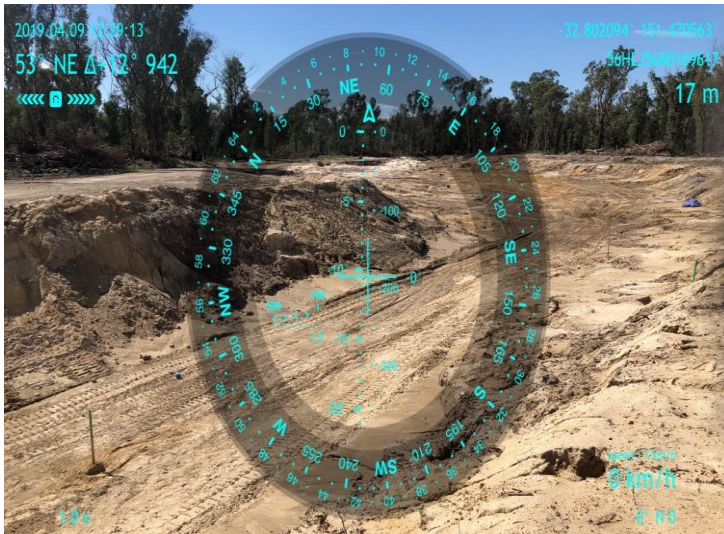
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ATTACHMENTS



ATTACHMENT A: PHOTOGRAPHIC RECORD



Photograph 1

Eastern section of the Municipal Landfill with GPS locations (WGS84), facing north-east.

View of edges and ground surfaces within the gully from the southern windrow, following the removal asbestos contaminated soil, mechanical excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on the 9<sup>th</sup> of April 2019.



Photograph 2

Eastern section of the Municipal Landfill facing north

View of northern edges and ground surfaces within the gully from the southern windrow, following the removal asbestos contaminated soil, mechanical excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on the 9<sup>th</sup> of April 2019.



Photograph 3

Eastern section of the Municipal Landfill facing north-east

View of edges and ground surfaces within the gully from the southern windrow, following the removal asbestos contaminated soil, mechanical excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on the 10<sup>th</sup> of April 2019.



Photograph 4

Eastern section of the Municipal Landfill facing north

View of edges and ground surfaces within the gully from the southern windrow, following the removal asbestos contaminated soil, mechanical excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on the 10th of April 2019.



Photograph 5

The middle of eastern section of the Municipal Landfill facing north

View of edges and ground surfaces within the gully from the southern windrow, following the removal asbestos contaminated soil, mechanical excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on the 10<sup>th</sup> of April 2019.



Photograph 6

The middle of the eastern section of the Municipal Landfill facing north

View of edges and ground surfaces within the gully from the southern windrow, following the removal asbestos contaminated soil, mechanical excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on the 10th of April 2019.



Photograph 7

Eastern section of the Municipal Landfill facing north-east

View of edges and ground surfaces within the gully from the southern windrow, following the removal asbestos contaminated soil, mechanical excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on the 10<sup>th</sup> of April 2019.



Photograph 8

Eastern section of the Municipal Landfill facing north

View of edges and ground surfaces within the gully from the southern windrow, following the removal asbestos contaminated soil, mechanical excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on the 10<sup>th</sup> of April 2019.



Photograph 9

Eastern section of the Municipal Landfill facing north

View of edges and ground surfaces within the gully from the southern windrow, following the removal asbestos contaminated soil, mechanical excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on the 10<sup>th</sup> of April 2019.



Photograph 10

The end of the eastern section of the Municipal Landfill facing east

View of edges and ground surfaces within the gully from the southern windrow, following the removal asbestos contaminated soil, mechanical excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on the 10<sup>th</sup> of April 2019.



Photograph 11

The end of the eastern section of the Municipal Landfill facing west

View of edges and ground surfaces within the gully from the gully bottom, following the removal asbestos contaminated soil, mechanical excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on the 10<sup>th</sup> of April 2019.



Photograph 12

Eastern section of the Municipal Landfill facing south-west

View of edges and ground surfaces within the gully from the bottom of the gully, following the removal asbestos contaminated soil, mechanical excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on the 10<sup>th</sup> of April 2019.





Photograph 13

Truck-loading platform of Eastern section of the Municipal Landfill facing west

View of platform surfaces out of the gully, following the removal asbestos contaminated soil, mechanical scrape, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on the 10<sup>th</sup> of April 2019.



Photograph 14

Eastern section of the Municipal Landfill facing south-west

View of platform surfaces, gully surface and edges from northern windrow, following the removal asbestos contaminated soil, mechanical scrape and excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on the 10<sup>th</sup> of April 2019.



Photograph 15

The middle of Eastern section of the Municipal Landfill facing south

View of gully surface and southern edges from northern windrow, following the removal asbestos contaminated soil, mechanical scrape and excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on the 10<sup>th</sup> of April 2019.



Photograph 16

The middle of eastern section of the Municipal Landfill facing south-west

View of gully surface and southern edges from northern windrow, following the removal asbestos contaminated soil, mechanical scrape and excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on the 10<sup>th</sup> of April 2019.



Photograph 17

The middle of eastern section of the Municipal Landfill facing south

View of platform surfaces, gully surface and edges from northern windrow, following the removal asbestos contaminated soil, mechanical scrape and excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on the 10<sup>th</sup> of April 2019.



Photograph 18

The middle of Eastern section of the Municipal Landfill facing south

View of ground surface and southern edges from the gully bottom, following the removal asbestos contaminated soil, mechanical scrape and excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on the 10<sup>th</sup> of April 2019.



Photograph 19

The middle of Eastern section of the Municipal Landfill facing north-east

View of ground surface and edges from the gully bottom, following the removal asbestos contaminated soil, mechanical scrape and excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on the 10<sup>th</sup> of April 2019.



Photograph 20

The middle of Eastern section of the Municipal Landfill facing north-east

View of ground surface and edges from the gully bottom, following the removal asbestos contaminated soil, mechanical scrape and excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on the 10<sup>th</sup> of April 2019.



Photograph 21

The end of Eastern section of the Municipal Landfill facing south

View of ground surface and edges from gully bottom, following the removal asbestos contaminated soil, mechanical scrape and excavation, followed by handpicking of any surficial asbestos fragments identified on the top surfaces of the residual soils.

As inspected on the 10<sup>th</sup> of April 2019.



ATTACHMENT B: SITE LAYOUT PLAN





## ATTACHMENT C: LIMITATIONS



## LIMITATIONS

Materials which were concealed or not included as part of our scope of work but become exposed during demolition or other works and are suspected of containing asbestos or other hazardous materials should have their composition determined prior to works in those sections continuing.

Hazmat acknowledges that this report may be used as or form part of Hydro Aluminium Kurri Kurri's site environmental validation documentation.

Hazmat has prepared this report for the purpose set out above. Because this report has been prepared for that purpose, it is not appropriate for this report to be used for any other purpose, without our prior written consent. It is also not appropriate for this report to be released to any other party (either in whole or in part) without Hazmat's prior written consent. Should you wish to use this report for a purpose other than the purpose for which it was prepared, or to release this report (either in whole or in part) to any other party, please contact Hazmat so that we may discuss your wishes in further detail with you.

Please note, however, that in the event this report is used for a purpose for which it was not prepared, and you have not obtained our prior written consent to use the report for that purpose, then neither Hazmat, nor any member or employee of Hazmat, accept responsibility or liability for the use of this report for that purpose.

In addition, this report does not, and does not purport to, give legal advice as to your actual or potential asbestos or hazardous material liabilities, or draw conclusions as to whether any particular circumstances constitute a breach of relevant legislation. You will appreciate that this advice can only be given by qualified legal practitioners.

Finally, Hazmat does not make any other warranty, expressed or implied, as to the professional advice contained in this report.

**APPENDIX 8**  
**95% UCL CALCULATIONS**



**UCL Statistics for Uncensored Full Data Sets**

User Selected Options	
Date/Time of Computation	ProUCL 5.122/05/2019 3:01:55 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

**C0**

**General Statistics**

Total Number of Observations	53	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	0.5	Mean	1.443
Maximum	11	Median	0.5
SD	2.248	Std. Error of Mean	0.309
Coefficient of Variation	1.558	Skewness	2.859

**Normal GOF Test**

Shapiro Wilk Test Statistic	0.495	<b>Shapiro Wilk GOF Test</b>
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.417	<b>Lilliefors GOF Test</b>
5% Lilliefors Critical Value	0.121	Data Not Normal at 5% Significance Level

**Data Not Normal at 5% Significance Level**

**Assuming Normal Distribution**

<b>95% Normal UCL</b>		<b>95% UCLs (Adjusted for Skewness)</b>	
95% Student's-t UCL	1.961	95% Adjusted-CLT UCL (Chen-1995)	2.081
		95% Modified-t UCL (Johnson-1978)	1.981

**Gamma GOF Test**

A-D Test Statistic	11.09	<b>Anderson-Darling Gamma GOF Test</b>
5% A-D Critical Value	0.78	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.459	<b>Kolmogorov-Smirnov Gamma GOF Test</b>
5% K-S Critical Value	0.126	Data Not Gamma Distributed at 5% Significance Level

**Data Not Gamma Distributed at 5% Significance Level**

**Gamma Statistics**

k hat (MLE)	0.985	k star (bias corrected MLE)	0.942
Theta hat (MLE)	1.465	Theta star (bias corrected MLE)	1.532
nu hat (MLE)	104.5	nu star (bias corrected)	99.88
MLE Mean (bias corrected)	1.443	MLE Sd (bias corrected)	1.487
		Approximate Chi Square Value (0.05)	77.82
Adjusted Level of Significance	0.0455	Adjusted Chi Square Value	77.28

**Assuming Gamma Distribution**

95% Approximate Gamma UCL (use when n>=50))	1.852	95% Adjusted Gamma UCL (use when n<50)	1.866
---	-------	--	-------

**Lognormal GOF Test**

Shapiro Wilk Test Statistic	0.575	<b>Shapiro Wilk Lognormal GOF Test</b>
5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.454	<b>Lilliefors Lognormal GOF Test</b>
5% Lilliefors Critical Value	0.121	Data Not Lognormal at 5% Significance Level

**Data Not Lognormal at 5% Significance Level**

<b>Lognormal Statistics</b>			
Minimum of Logged Data	-0.693	Mean of logged Data	-0.22
Maximum of Logged Data	2.398	SD of logged Data	0.905
<b>Assuming Lognormal Distribution</b>			
95% H-UCL	1.597	90% Chebyshev (MVUE) UCL	1.71
95% Chebyshev (MVUE) UCL	1.942	97.5% Chebyshev (MVUE) UCL	2.265
99% Chebyshev (MVUE) UCL	2.899		
<b>Nonparametric Distribution Free UCL Statistics</b>			
<b>Data do not follow a Discernible Distribution (0.05)</b>			
<b>Nonparametric Distribution Free UCLs</b>			
95% CLT UCL	1.951	95% Jackknife UCL	1.961
95% Standard Bootstrap UCL	1.944	95% Bootstrap-t UCL	2.24
95% Hall's Bootstrap UCL	2.049	95% Percentile Bootstrap UCL	1.972
95% BCA Bootstrap UCL	2.113		
90% Chebyshev(Mean, Sd) UCL	2.37	<b>95% Chebyshev(Mean, Sd) UCL</b>	<b>2.789</b>
97.5% Chebyshev(Mean, Sd) UCL	3.372	99% Chebyshev(Mean, Sd) UCL	4.516
<b>Suggested UCL to Use</b>			
<b>95% Chebyshev (Mean, Sd) UCL</b>	<b>2.789</b>		
<b>Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.</b>			
<b>Recommendations are based upon data size, data distribution, and skewness.</b>			
<b>These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).</b>			
<b>However, simulation results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.</b>			

**UCL Statistics for Uncensored Full Data Sets**

User Selected Options

Date/Time of Computation	ProUCL 5.16/4/2019 12:04:34 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

**Zinc**

**General Statistics**

Total Number of Observations	54	Number of Distinct Observations	29
		Number of Missing Observations	0
Minimum	2.5	Mean	28.64
Maximum	160	Median	9
SD	34.41	Std. Error of Mean	4.683
Coefficient of Variation	1.202	Skewness	1.675

**Normal GOF Test**

Shapiro Wilk Test Statistic	0.776	<b>Shapiro Wilk GOF Test</b>
5% Shapiro Wilk P Value	1.434E-10	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.234	<b>Lilliefors GOF Test</b>
5% Lilliefors Critical Value	0.12	Data Not Normal at 5% Significance Level

**Data Not Normal at 5% Significance Level**

**Assuming Normal Distribution**

<b>95% Normal UCL</b>		<b>95% UCLs (Adjusted for Skewness)</b>	
95% Student's-t UCL	36.48	95% Adjusted-CLT UCL (Chen-1995)	37.48
		95% Modified-t UCL (Johnson-1978)	36.66

**Gamma GOF Test**

A-D Test Statistic	2.343	<b>Anderson-Darling Gamma GOF Test</b>
5% A-D Critical Value	0.795	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.178	<b>Kolmogorov-Smirnov Gamma GOF Test</b>
5% K-S Critical Value	0.126	Data Not Gamma Distributed at 5% Significance Level

**Data Not Gamma Distributed at 5% Significance Level**

**Gamma Statistics**

k hat (MLE)	0.728	k star (bias corrected MLE)	0.7
Theta hat (MLE)	39.31	Theta star (bias corrected MLE)	40.89
nu hat (MLE)	78.67	nu star (bias corrected)	75.64
MLE Mean (bias corrected)	28.64	MLE Sd (bias corrected)	34.22
		Approximate Chi Square Value (0.05)	56.61
Adjusted Level of Significance	0.0456	Adjusted Chi Square Value	56.15

**Assuming Gamma Distribution**

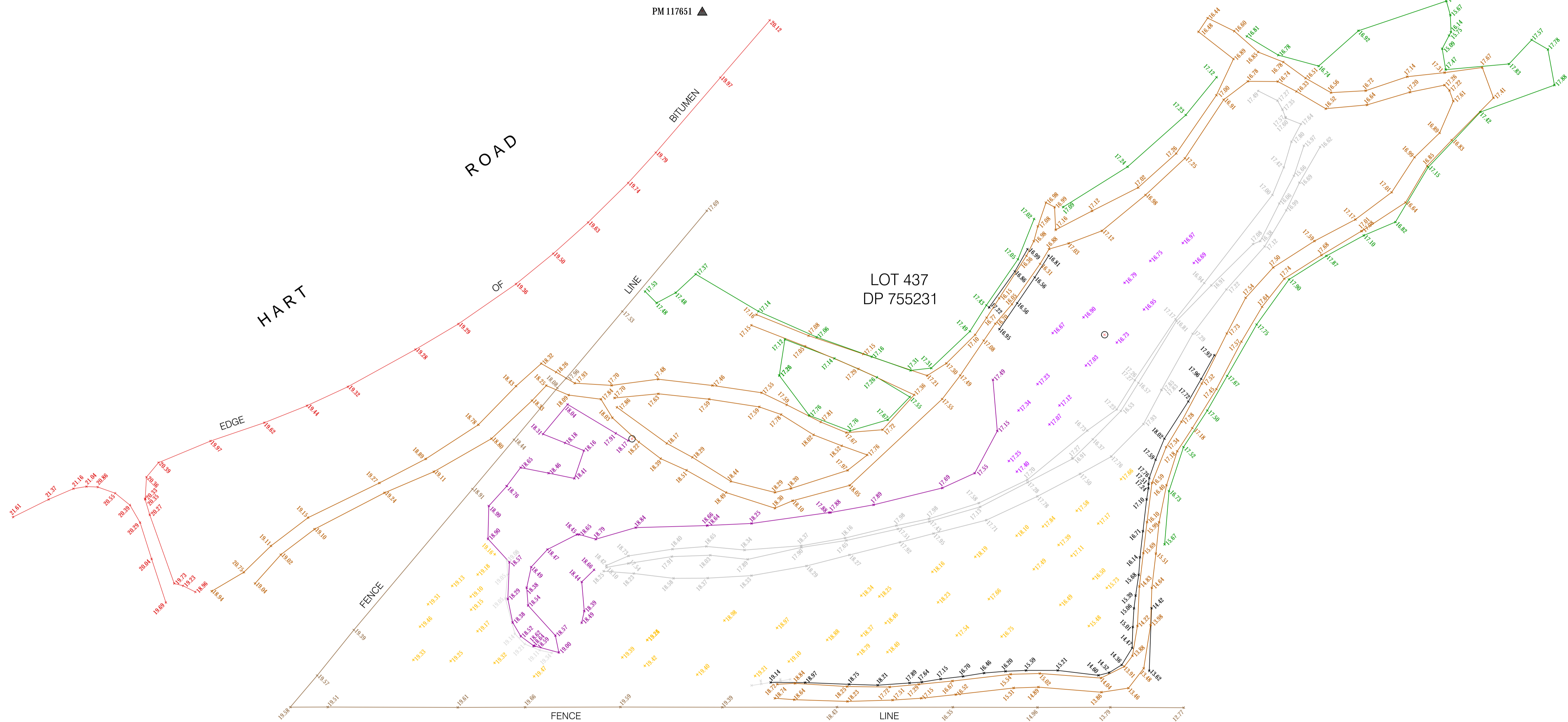
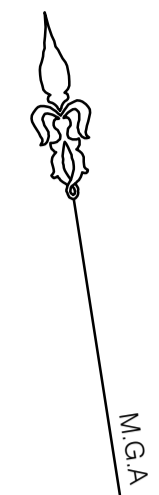
95% Approximate Gamma UCL (use when n>=50))	38.27	95% Adjusted Gamma UCL (use when n<50)	38.58
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**Lognormal GOF Test**

Shapiro Wilk Test Statistic	0.86	<b>Shapiro Wilk Lognormal GOF Test</b>
5% Shapiro Wilk P Value	1.1639E-6	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.193	<b>Lilliefors Lognormal GOF Test</b>

5% Lilliefors Critical Value	0.12	Data Not Lognormal at 5% Significance Level	
<b>Data Not Lognormal at 5% Significance Level</b>			
<b>Lognormal Statistics</b>			
Minimum of Logged Data	0.916	Mean of logged Data	2.53
Maximum of Logged Data	5.075	SD of logged Data	1.385
<b>Assuming Lognormal Distribution</b>			
95% H-UCL	56.3	90% Chebyshev (MVUE) UCL	54.99
95% Chebyshev (MVUE) UCL	65.54	97.5% Chebyshev (MVUE) UCL	80.18
99% Chebyshev (MVUE) UCL	109		
<b>Nonparametric Distribution Free UCL Statistics</b>			
<b>Data do not follow a Discernible Distribution (0.05)</b>			
<b>Nonparametric Distribution Free UCLs</b>			
95% CLT UCL	36.34	95% Jackknife UCL	36.48
95% Standard Bootstrap UCL	36.12	95% Bootstrap-t UCL	37.92
95% Hall's Bootstrap UCL	37.83	95% Percentile Bootstrap UCL	36.64
95% BCA Bootstrap UCL	37.92		
90% Chebyshev(Mean, Sd) UCL	42.69	95% Chebyshev(Mean, Sd) UCL	49.05
97.5% Chebyshev(Mean, Sd) UCL	57.88	99% Chebyshev(Mean, Sd) UCL	75.24
<b>Suggested UCL to Use</b>			
95% Chebyshev (Mean, Sd) UCL	49.05		
<p>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.</p>			

## APPENDIX 9 SURVEY



▲ PM 44781

**Notes:**

No boundary survey has been undertaken. Bearings and dimensions are from title only and are subject to confirmation by boundary survey.

Origin of co-ordinates PM 117651.

Levels are based on Australian Height Datum (AHD), using PM 117651, with a reduced level 20.21.



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W: www.veris.com.au  
ABN 53 615 735 727

Issue	Amendment	Date

LEGEND

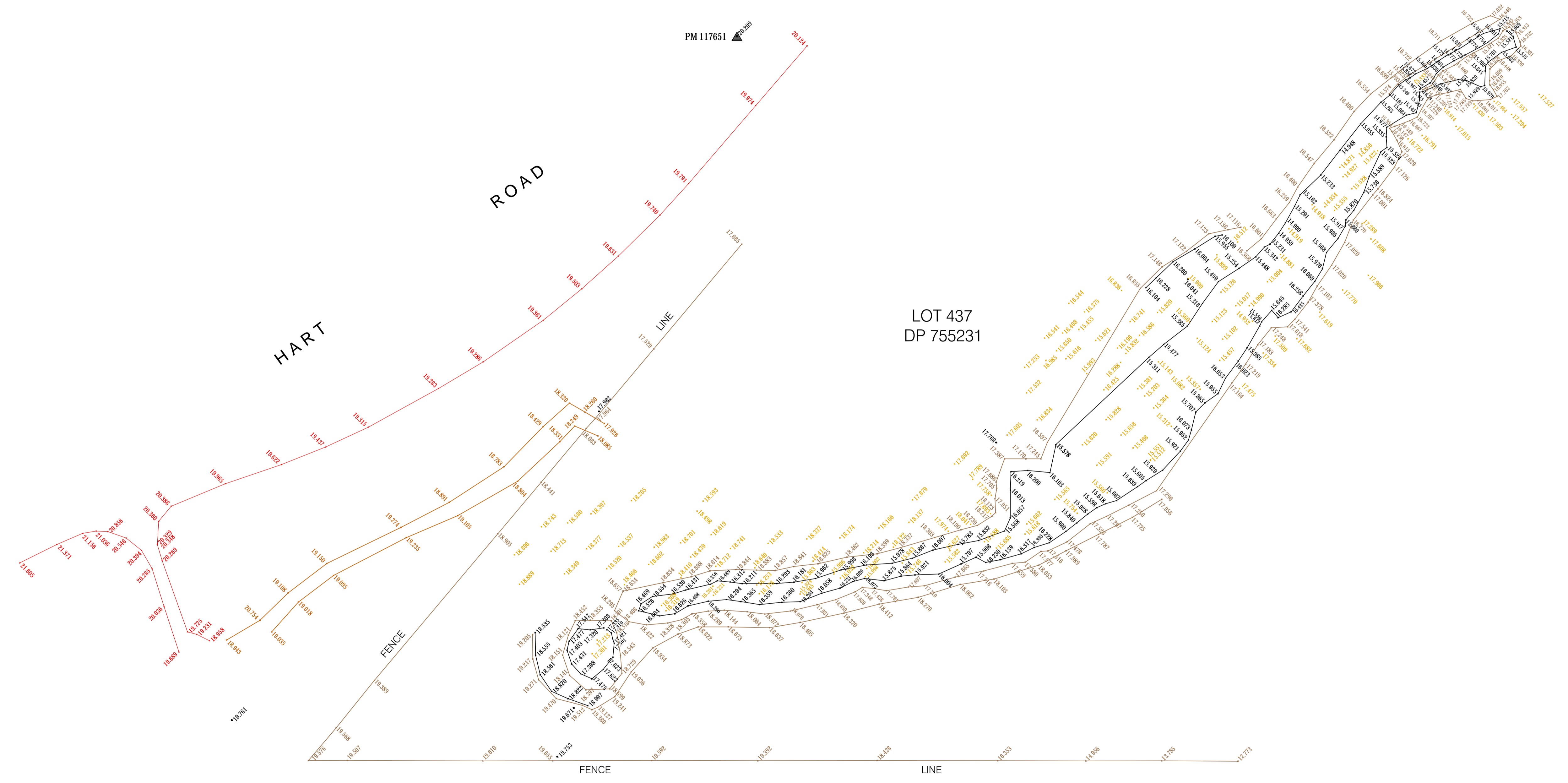
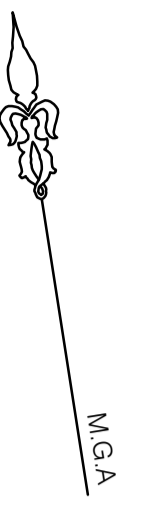
CLIENT
CMA CONTRACTING

PROJECT
HART ROAD, LOXFORD

TITLE INFORMATION
Lot: 437, 436, 435
Plan No: 755231
Title / Folio: -
L.G.A.: -
Parish: -
County: -

QUALITY ASSURANCE
Surveyor: DF
Drawn: ME
Checked by: DF Date: 04/06/19
Approved by: DF Date: 04/06/19

COPYRIGHT ©	Date of Survey	Date of Plan
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	Datum: AHD	Co-ords: MGA
	Scale: 1:700	(Original size A1)
Cad ref: 201163-DETL-001A		Sheet 1 of 1
JOB NUMBER	DRAWING NUMBER / ISSUE	
201163	DETL-001 / A	



PM 44781

**Notes:**

No boundary survey has been undertaken. Bearings and dimensions are from title only and are subject to confirmation by boundary survey.

Origin of co-ordinates PM 117651.

Levels are based on Australian Height Datum (AHD), using PM 117651, with a reduced level 20.21.

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Issue	Amendment	Date

LEGEND

**CLIENT**

CMA CONTRACTING

**PROJECT**

HART ROAD,  
LOXFORD

**DRAWING TITLE**

DETAIL SURVEY

**TITLE INFORMATION**

Lot: 437, 436, 435  
Plan No: 755231  
Title / Folio: -  
L.G.A.: -  
Parish: -  
County: -

**QUALITY ASSURANCE**

Surveyor: DF  
Drawn: ME  
Checked by: DF Date: 04/06/19  
Approved by: DF Date: 04/06/19

COMPLETION OF QUALITY ASSURANCE IS EVIDENCE THAT THE SURVEY WORKS ACCURATELY AND THE DRAWING HAS BEEN CHECKED AND CORRECTED WITH THE REQUIREMENTS OF THE QUALITY PLAN. WHERE THE QUALITY ASSURANCE IS INCOMPLETE ALL INFORMATION ON THIS DRAWING IS INTENDED FOR PRELIMINARY PURPOSES ONLY AS IT IS UNRELIABLE.

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Date of Survey: APR 2019	Date of Plan: 04/06/19
Datum: AHD	Co-ords: MGA
Scale: 1:700	(Original size A1)
Cad ref: 201163-DETL-002A	Sheet 1 of 1
JOB NUMBER: 201163	DRAWING NUMBER / ISSUE: DETL-002 / A

**APPENDIX 10  
ENM ASSESSMENT**



8 April 2014

Our Ref: AS130328

## Delivered Via Email

Hydro Aluminium Kurri Kurri Pty Ltd  
Attention: Richard Brown, General Manager

Dear Richard,

## Classification for Stockpiled Soil, Grahams Lane

### Introduction

ENVIRON Australia (ENVIRON) was commissioned by Hydro Aluminium Kurri Kurri Pty Ltd (Hydro) to assess if a stockpile of excavated soil material, associated with the recent construction of the Hunter Expressway, adjacent to the Hydro buffer Zone Area, met the criteria for Excavated Natural Material as defined in the Protection of the Environment Operations (Waste) Regulation 2005 – General Exemption Under Part 6, Clause 51 and 51A, The Excavated Natural Material Exemption 2012.

The objective of this assessment was to determine if the material in the stockpile meets the definition of Excavated Natural Material so that Hydro can transport the material for use as clean fill within the Hydro owned lands. ENVIRON understands that the stockpile was originally placed in the (closed) Grahams Lane area by Hunter Expressway contractors, Abigroup. Abigroup estimated the soil stockpile at approximately 11,000 tonnes.

The assessment was completed in accordance with the requirements of The Excavated Natural Material Exemption 2012 (the 2012 exemption). The scope of work was as follows:

- Preparation of a written sampling plan, including information on sample preparation and storage, as per Section 8.1 of the 2012 Exemption.
- Undertake characterisation of the stockpile in accordance with the requirements listed in Columns 1 and 2 of Table 3 for the range of chemicals and other attributes listed in Column 1 of Table 2 of the 2012 Exemption.
- Characterisation sampling included collection and analysis of 27 soil samples for a stockpile of less than 11,000 tonnes, based on Table 3 of the 2012 Exemption. These soil samples were analysed for Heavy Metals (arsenic, cadmium, chromium, copper, nickel, lead, zinc, mercury), electrical conductivity, pH, Polycyclic Aromatic Hydrocarbons, Total Petroleum Hydrocarbons, Benzene, Toluene, Ethyl benzene and Xylene (BTEX) and NSW Roads and Traffic Authority Test Method T276 Foreign Materials Content of Recycled Crushed Concrete, as per Column 1 of Table 2 of the 2012 Exemption. Analysis was completed at a laboratory that is NATA accredited for the analysis required (ALS Environmental).
- Comparison of laboratory results to Column 2 and Column 3 of Table 2 of the 2012 Exemption. The stockpiled soils can be classified as ENM in the event that the laboratory results are below the maximum average concentration and absolute maximum concentration for characterisation.
- Completion of a written report indicating the classification of the material.

## Sampling Plan

Hydro indicated the material was excavated from an area associated with the construction of the Hunter Expressway and the volume of stockpiled soil was approximately 6,000m<sup>3</sup>. Abigroup had provided to Hydro a Virgin Excavated Natural Material certificate, prepared by VGT 2011 including traceability drawings. This information is contained within **Appendix A** and demonstrates that the material was considered to be VENM at the time of excavation and stockpiling.

## Site Visit

An initial site visit was undertaken on the 20<sup>th</sup> March 2014 to inspect the stockpile and evaluate the currency of the VENM certification. The stockpile was observed to be approximately 190m in length, by 12m wide by 2.5m high, with a volume estimate of 6000m<sup>3</sup> or 11000 tonnes using a density estimate of 1.9t/m<sup>3</sup>. The soil was located in a linear stockpile along the length of Grahams Lane, from the intersection with Bishops Bridge Road to within 10m of the boundary with the new Expressway. Soil material was also stockpiled along Bishops Bridge Road, however this material was not assessed as part of this investigation.

The site inspection involved a walkover of the stockpile and the excavation of trenches within the stockpile at approximately 20m centres. Excavations identified the stockpile to comprise extremely weathered conglomerate, sandy clays. The stockpile had been surface mulched to prevent erosion and therefore the upper layers contained a high organic content. During the walkover occasional fragments of ceramic tile were identified on the surface, however no foreign materials were identified within the excavations. The presence of the ceramic tile voided the VENM certification and it was determined that an ENM certification was required. Photos from the initial site visit are contained in **Appendix B**.

Sample collection for ENM evaluation was conducted on the 21<sup>st</sup> March 2014. The stockpile was observed to comprise brown clay and sandy clay, with some gravel and plant material (roots, sticks etc). A trace of ceramic tiles was noted in one area.

The sampling plan was as follows:

- As the material is stockpiled, the number of samples required was assessed using Table 3 of the 2012 Exemption. Based on the estimated volume, 27 samples were collected from the stockpile.
- One composite and one discrete soil sample was collected at each sampling location. In addition, ten samples (duplicates of the discrete samples) were also collected for asbestos identification. The samples were labelled Composite 1/ Discrete 1 to Composite 27/ Discrete 27.
- The composite samples were collected by combining five sub-samples of equal size into a single laboratory-supplied sample bag. The sample volume was a minimum of 6kg, as required by the laboratory for analysis. The discrete samples were collected into laboratory-supplied acid-washed glass jars of 250ml.
- The discrete soil samples were collected from beneath the surface of the stockpile by hand using dedicated disposable gloves. The composite sample was collected from beneath the surface of the stockpile using a trowel. The trowel was decontaminated by rinsing with a solution of Decon90 and water. The discrete samples were immediately placed into an ice filled esky and kept chilled during transportation to the laboratory.

- The samples were transported to the laboratory under chain of custody conditions. The chain of custody outlined the analysis. The composite samples were analysed for pH, electrical conductivity, heavy metals (arsenic, cadmium, chromium, copper, nickel, lead, zinc and mercury) and foreign material testing (rubber, plastic, bitumen, paper, cloth, paint and wood). The discrete samples were analysed for Total Petroleum Hydrocarbons (TPH), Benzene, Toluene, Ethyl benzene and Xylene (BTEX) and Polycyclic Aromatic Hydrocarbons (PAHs).
- The samples were collected on 21 March 2014 and were received at the laboratory within 2 hours of collection.

## Results

The laboratory results have been compared against the maximum average concentration and the absolute maximum concentration, provided in Table 2 of the 2012 Exemption.

The laboratory reports are included in **Appendix C**.

<b>Table 1: Comparison of Results Against 2012 Exemption Criteria (mg/kg except where noted)</b>					
<b>Chemical</b>	<b>Average Concentration</b>	<b>Criteria for Max. Average Conc.</b>	<b>Absolute Maximum Concentration</b>	<b>Criteria for Absolute Maximum Conc.</b>	<b>No. of Exceedences</b>
Mercury	<0.1	0.5	<0.1	1	0
Cadmium	<0.4	0.5	<0.4	1	0
Lead	8.1	50	10	100	0
Arsenic	<5	20	<5	40	0
Chromium (total)	10.2	75	16	150	0
Copper	<5	100	<5	200	0
Nickel	3.9	30	6	60	0
Zinc	13.3	150	20	300	0
Electrical Conductivity (dS/m)	0.025	1.5	0.0636	3	0
pH (pH units)	5.39	5 to 9	6.9	4.5 to 10	0
Total PAHs	0	20	0	40	0
BaP	<0.5	0.5	<0.5	1	0
Benzene	<0.2	NA	<0.2	0.5	0
Toluene	<0.5	NA	<0.5	65	0
Ethyl benzene	<0.5	NA	<0.5	25	0
Xylene	<0.5	NA	<0.5	15	0
TPH	<100	250	<100	500	0
Foreign Materials, including Rubber, plastic, bitumen, paper, cloth, paint and wood (%)	<b>0.19<sup>a</sup></b>	<b>0.05%</b>	<b>0.74<sup>a</sup></b>	<b>0.1%</b>	<b>19</b>

<sup>a</sup> the "foreign materials" component is entirely composed of woody material (ie, no rubber, plastic, bitumen, paper, cloth, paint etc)

## Conclusion

ENVIRON completed an assessment of a stockpile of excavated soil material from construction of the Hunter Expressway, placed on the Grahams Lane area of the Hydro Buffer Zone. The stockpile was estimated to be approximately 6,000m<sup>3</sup> and comprised brown clays and sandy clays. The stockpile has been characterised in accordance with the requirements of the *Protection of the Environment Operations (Waste) Regulation 2005 – General Exemption Under Part 6, Clause 51 and 51A, The Excavated Natural Material Exemption 2012*.

Based on the results of the sampling of the stockpile, this material satisfies the requirements of the 2012 Exemption for Excavated Natural Material in all respects, with the exception of the percentage of “wood” materials present. Based on observations made during the sampling process, this “wood” material consists entirely of vegetative matter (roots, twigs etc) which had been part of existing vegetation removed during the excavation/stockpiling process.

In ENVIRON’s opinion, based on observations made during the site inspection and the analytical results, the stockpiled soil satisfies the requirements for Excavated Natural Material. We believe the slightly elevated proportion of vegetative material does not compromise the environmental condition of the soil.

You should note however that the presence of this material may affect the geotechnical properties of the soil.

It is recommended that Hydro personnel supervise the loading of the stockpile and transport of the stockpile to the Hydro site., Hydro should seek advice from a suitably qualified person if the stockpiled soils vary noticeably from that described above in soil type, colour or content of foreign materials.

## Limitations

ENVIRON Australia prepared this report in accordance with the scope of work as outlined in our email to Hydro dated 20 March 2014 and in accordance with our understanding and interpretation of current regulatory standards.

A representative program of sampling and laboratory analyses was undertaken as part of this investigation, based on past and present known uses of the site. While every care has been taken, concentrations of contaminants measured may not be representative of conditions between the locations sampled and investigated. We cannot therefore preclude the presence of materials that may be hazardous.

Site conditions may change over time. This report is based on conditions encountered at the site at the time of the report and ENVIRON disclaims responsibility for any changes that may have occurred after this time.

The conclusions presented in this report represent ENVIRON’s professional judgment based on information made available during the course of this assignment and are true and correct to the best of ENVIRON’s knowledge as at the date of the assessment.

ENVIRON did not independently verify all of the written or oral information provided to ENVIRON during the course of this investigation. While ENVIRON has no reason to doubt the accuracy of the information provided to it, the report is complete and accurate only to the extent that the information provided to ENVIRON was itself complete and accurate.

This report does not purport to give legal advice. This advice can only be given by qualified legal advisors.

### **User Reliance**

This report has been prepared exclusively for Hydro and may not be relied upon by any other person or entity without ENVIRON's express written permission.

Yours faithfully,  
ENVIRON Australia Pty Ltd



Steve Cadman  
Senior Environmental Scientist



Fiona Robinson  
Manager – Hunter Office

#### Attachments:

- Appendix A VGT VEMN certificate
- Appendix B Photos
- Appendix C Laboratory Analytical Report

**Appendix A**  
**VGT VENM Certificate**

Thursday, 15<sup>th</sup> September 2011



Environmental  
Compliance  
Solutions

Abi Group Pty Ltd  
Hunter Expressway group  
PO Box 97  
Lochinvar NSW 2321  
ATTN: Mr John Wiggers de Vries

PO Box 2335 Greenhills NSW 2323  
F (02) 4028 6413 E mail@vgt.com.au  
www.vgt.com.au ABN 79 103 636 353

P (02) 4028 6412

**RE: MATERIAL INSPECTION-VALIDATION FOR ROAD WORKS AT SAWYERS GULLY, NSW.**

Dear Mr Wiggers de Vries,

As requested, VGT Pty Ltd has inspected the above site on the 15<sup>th</sup> September 2011, to evaluate the status of the top soil material for the purposes of determining whether it comprises of Virgin Excavated Natural Material (VENM).

On site observations and discussion with you indicates the site is surrounded by road work activities. The site, on the day of investigation was undergoing some extensive pre-stripping works. Power lines run though the site and ENM stockpiles were identified in the vicinity but these were not assessed and VGT was advised these will not be part of any VENM haulage activities.

The three sites investigated were named Strip A (Chainage 17685 to 17765), Strip B (Chainage 17850 to 17900) and Strip C (Chainage 18090 to 18200). Test pit were dug by a backhoe to the proposed depth of VENM stripping activities.

Strip A (grid reference 0356579 6371092) is an island of unstripped material approximately 10 metres wide with stripped vegetation lying on top. Two test pits were sunk which encountered insitu dark brown soil to a depth of 10 centimetres.

Strip B (grid reference 0356507 6371184) is an island of unstripped material approximately 10 metres wide with stripped vegetation lying on top. One test pit sunk which also encountered insitu dark brown soil to a depth of 10 centimetres.

Strip C (grid reference 0356319 6371441) is a cleared site with no top soil but the sub surface material is unsuitable and needs to be stripped. Four test pits were sunk in the 55 metre wide strip, roots were encountered and silty sandy loams down to a maximum depth of 40 centimetres.

Given the nature of the activities onsite, it is possible that contamination of the VENM could occur during excavation and loading activities. Care should be taken to ensure no ENM or any imported material becomes mixed in the truck used to relocate the VENM material. Attached photographs show the status of the site.

In summary, whilst no formal sampling and analysis was conducted, VGT Pty Ltd has identified the soil and sub soil material to be Virgin Excavated Natural Material (VENM). This is acceptable according to the EPA's "Waste Classification Guidelines- Part 1: Classifying Waste".

We trust the above meets with your requirements. Should you have any questions please don't hesitate to contact me 0428 279 023.

Yours Sincerely,



Greg Thomson  
Geologist VGT Pty Ltd  
M AusIMM, FIQA



Strip A

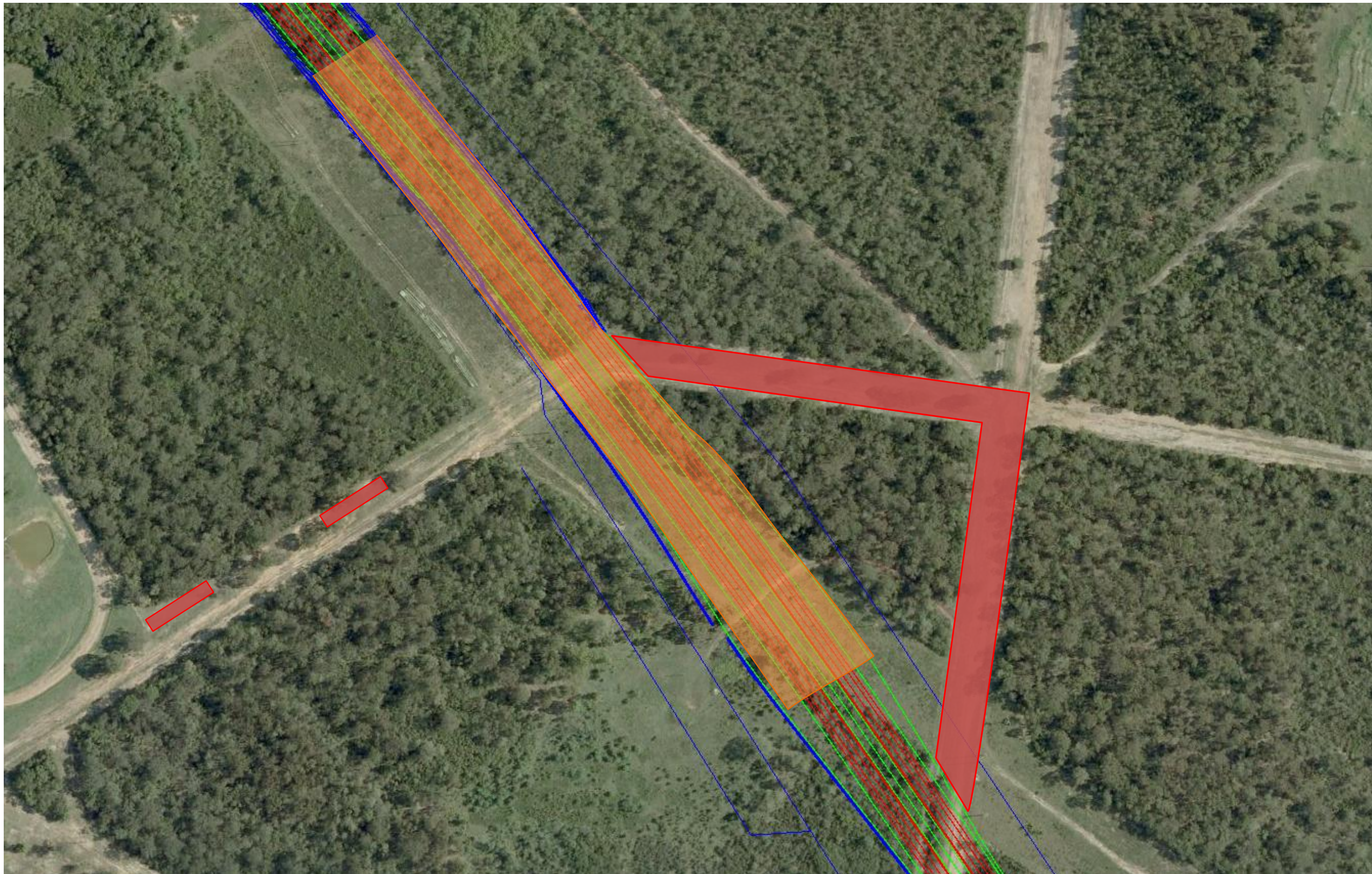





Strip B

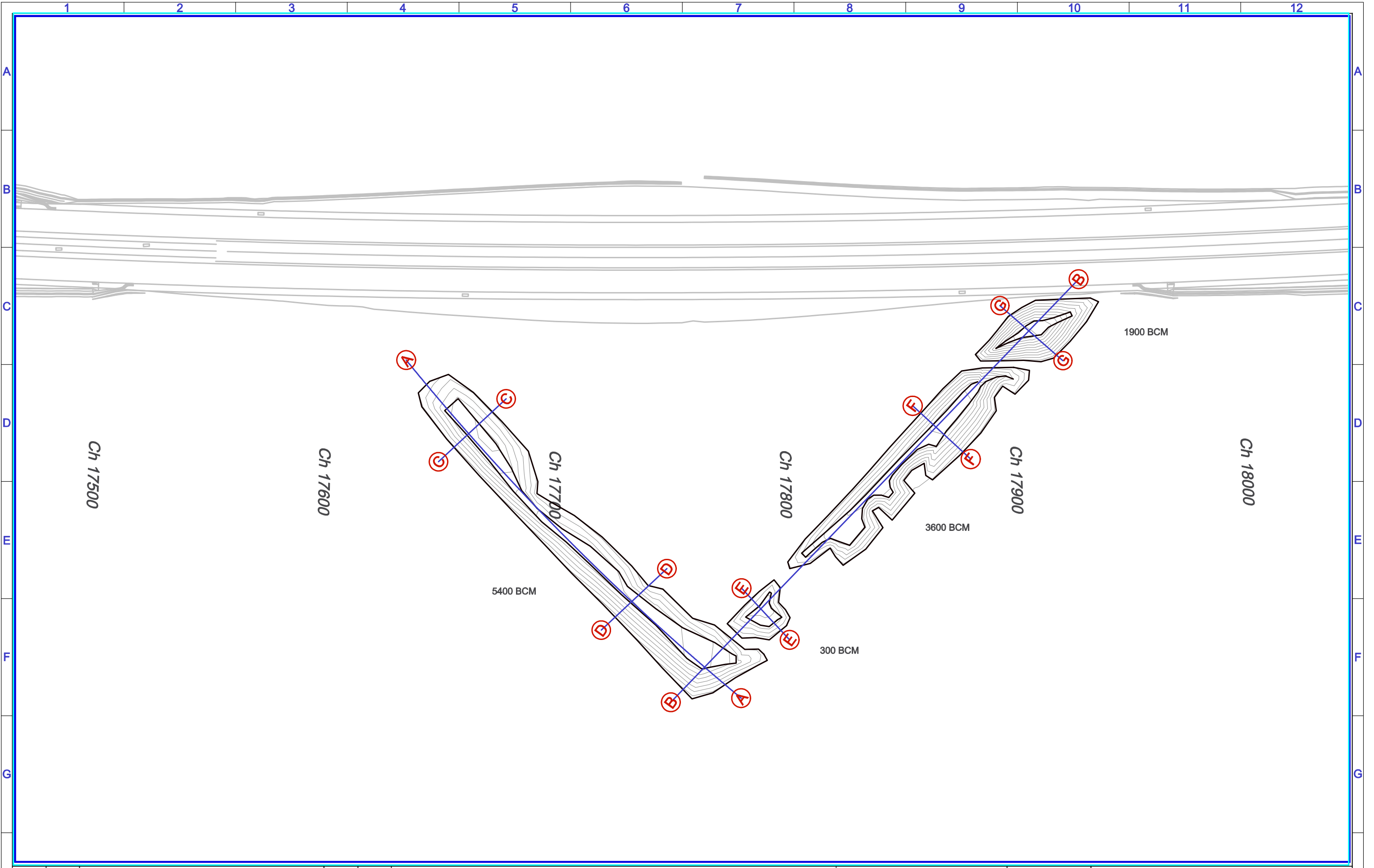




Strip C



 <b>Abigroup</b> Constructing Australia's Future Hunter Expressway Kurri Kurri to Branxton	Date: 20-11-13	<b>Drawing Description:</b> Traceability diagram of VENM to Bishops Bridge Road and Grahams Lane.	<b>Key:</b> Source of Excavated Natural Material sent to stockpiles on Grahams Lane and Bishops Bridge Road  Location of Grahams Lane / Bishops Bridge Road stockpiles 
	Rev: 1		



REV	ZONE	AMENDMENTS	APP'D	DATE	GENERAL NOTES / REFERENCES

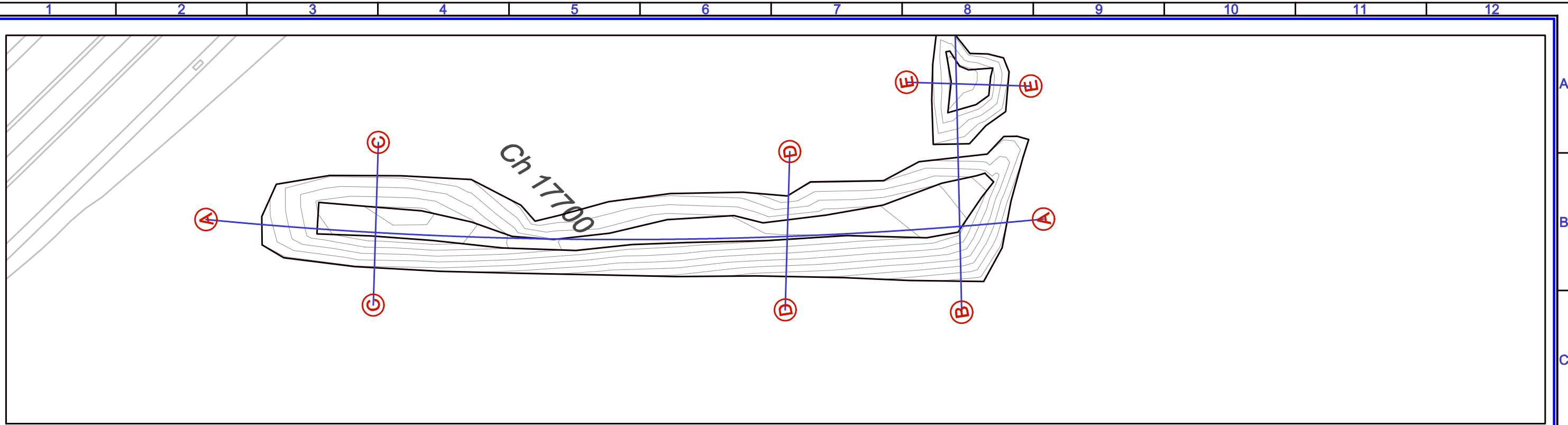
© Abigroup.

**Abigroup**  
 ABIGROUP CONTRACTORS  
 Hunter Expressway D&C  
 1054 Old Maitland Road, Sawyers Gully, NSW, 2326  
 Ph 02 4015 4000 Fax 02 4015 4001

SURVEYED / DRAWN BY  
 Dan Ripley  
 CHECKED  
 VERIFIED  
 SCALE 1500

PLOT DATE: Thu Nov 14 16:35:46 2013 LOCATION :  
**Hunter Expressway**  
**Bishops and Graham Proposed Pile**  
 DRAWING STATUS DRAWING No. DR-HEX-4.12 REV.

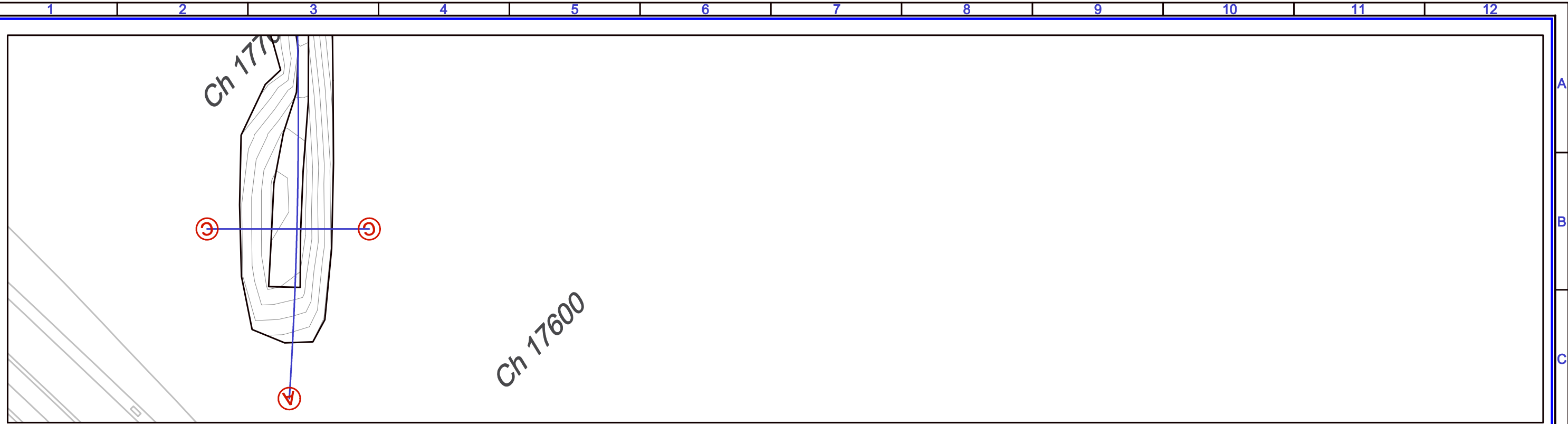
ABIGROUP STANDARD DRAWING EDITION 13/06/2007



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Natural Surface		26.278	26.430	26.555	26.640	26.696	26.634	26.552	26.273	26.062	25.786	25.568	25.426	25.295	25.103	24.728	24.515	24.376	24.201	23.740	23.419	23.053	22.717
Height Of Fill				0.848	1.823	2.166	2.272	2.192	2.047	1.743	1.693	1.747	1.904	1.981	2.040	2.298	2.491	2.613	2.496	2.665	2.534	0.179	
Chainage		0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	209

**Section A - A**  
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 VERT SCALE 1 : 1000

Project: 131185 Assorted Pile Modelling 10/06/2013	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>REV</th> <th>ZONE</th> <th>AMENDMENTS</th> <th>APP'D</th> <th>DATE</th> <th>GENERAL NOTES / REFERENCES</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	REV	ZONE	AMENDMENTS	APP'D	DATE	GENERAL NOTES / REFERENCES																									 <b>Abigroup</b> <small>           ABIGROUP CONTRACTORS            Hunter Expressway D&amp;C            1004 Old Millbank Road, Dunmore East, NSW, 2226            Ph 02 4975 4000 Fax 02 4975 4001         </small>	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">           SURVEYED / DRAWN BY  <b>Dan Ripley</b> </td> <td style="width: 50%;">           PLOT DATE: Thu Nov 14 16:28:26 2013    LOCATION :         </td> </tr> <tr> <td>CHECKED</td> <td><b>Hunter Expressway</b></td> </tr> <tr> <td>VERIFIED</td> <td><b>Bishops Bridge Section A - A</b></td> </tr> <tr> <td>SCALE</td> <td>DRAWING STATUS    DRAWING No.    REV.</td> </tr> <tr> <td> </td> <td>     131114     </td> </tr> </table>	SURVEYED / DRAWN BY <b>Dan Ripley</b>	PLOT DATE: Thu Nov 14 16:28:26 2013    LOCATION :	CHECKED	<b>Hunter Expressway</b>	VERIFIED	<b>Bishops Bridge Section A - A</b>	SCALE	DRAWING STATUS    DRAWING No.    REV.		131114
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SCALE	DRAWING STATUS    DRAWING No.    REV.																																										
	131114																																										



Datum 16

Natural Surface	27.659	27.213	26.671	26.455	26.110
Height Of Fill		0.541	2.292	0.359	
Chainage	0	10	20	30	38

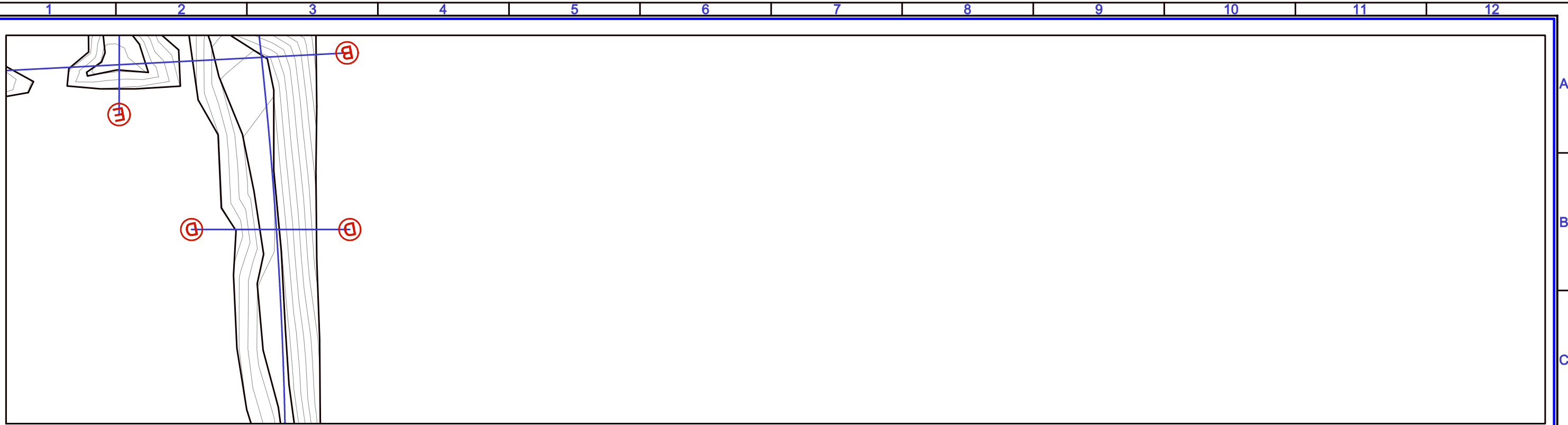
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 VERT SCALE 1 : 1000

REV	ZONE	AMENDMENTS	APP'D	DATE	GENERAL NOTES / REFERENCES

**Abigroup**  
 AMOROP CONTRACTORS  
 Hunter Expressway D&C  
 1004 Old Maitland Road, Sempers Gully, NSW, 2286  
 Ph 02 4958 4000 Fax 02 4958 4001

SURVEYED / DRAWN BY Dan Ripley	PLOT DATE: Thu Nov 14 16:29:17 2013	LOCATION :
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VERIFIED	DRAWING STATUS	DRAWING No. 131114
SCALE	REV.	

AMOROP CONTRACTORS DRAWING NUMBER 131114



Datum 13

Natural Surface	25.345	24.912	24.480	24.048	23.830
Height Of Fill		0.904	2.057		
Chainage	0	10	20	30	35

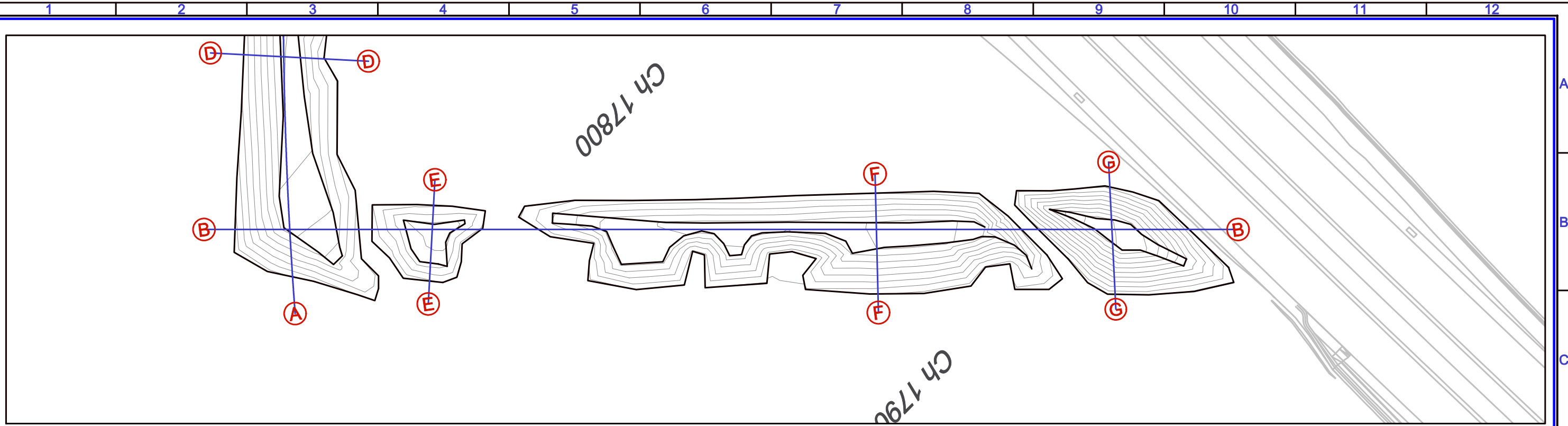
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REV	ZONE	AMENDMENTS	APP'D	DATE	GENERAL NOTES / REFERENCES

**Abigroup**  
 AMOROP CONTRACTORS  
 Hunter Expressway D&C  
 1004 Old Maitland Road, Sempers Gap, NSW, 2226  
 Ph 02 4916 4000 Fax 02 4916 4001

SURVEYED / DRAWN BY Dan Ripley	PLOT DATE: Thu Nov 14 16:29:47 2013	LOCATION :
CHECKED	Hunter Expressway Bishops Bridge Section D - D	
VERIFIED	DRAWING STATUS	DRAWING No. 131114
SCALE	REV.	

AMOROP STANDARD DRAWING SECTION 01/06/2007




Datum 12		0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	258
Natural Surface		22.542	22.944	23.411	23.872	24.192	24.538	24.839	24.958	25.473	25.841	26.006	26.033	26.054	25.967	25.924	25.790	25.584	25.378	25.242	25.093	24.913	24.766	24.673	24.600	24.561	24.226	24.043
Height Of Fill			0.741	2.731	1.977		1.411	1.248			0.614	1.611	1.881	1.994	2.168	2.206	2.375	2.826	3.236	3.433	3.289	1.374	0.605	3.881	4.177	1.890		
Chainage		0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	258

**Section B - B**

HRZ SCALE 1 : 1000

VERT SCALE 1 : 1000

REV	ZONE	AMENDMENTS	APP'D	DATE	GENERAL NOTES / REFERENCES



**ABIGROUP CONTRACTORS**  
 Hunter Expressway D&C  
 1004 Old Millbank Road, Dunmore East, NSW, 2586  
 Ph 02 4975 4000 Fax 02 4975 4001

**SURVEYED / DRAWN BY**  
Dan Ripley

**CHECKED**

**VERIFIED**

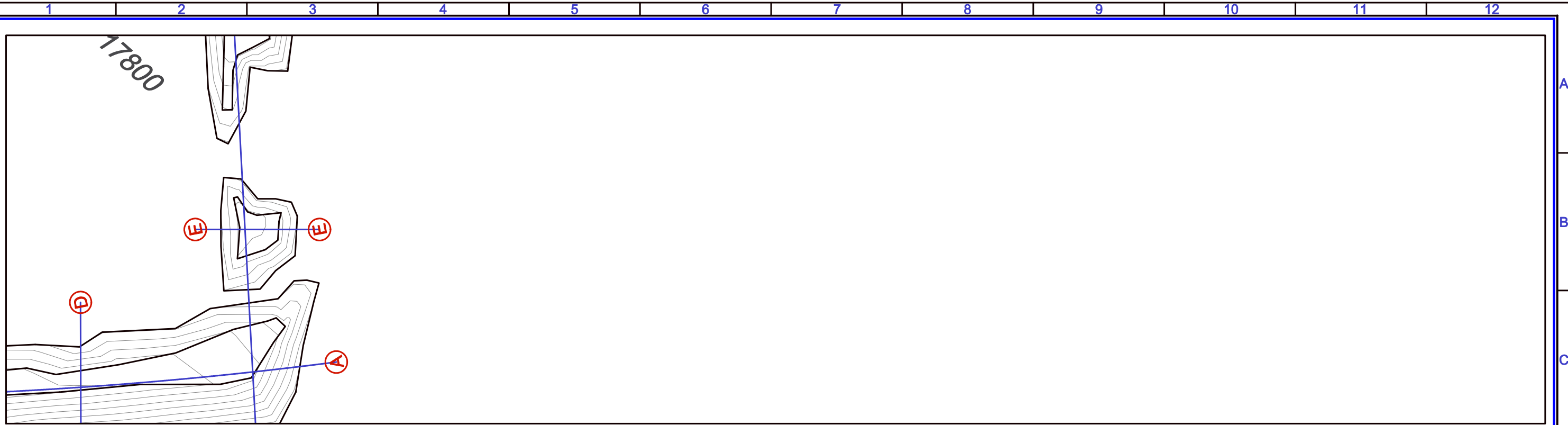
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**Hunter Expressway**  
**Graham Lane Section B - B**

**DRAWING STATUS**    **DRAWING No.** 131114    **REV.**

Abigroup STRATAFORM DRAWING SYSTEM 05/06/2007



Datum 14

Natural Surface	25.006	24.728	24.449	24.191
Height Of Fill		1.355	0.825	
Chainage	0	10	20	28

**Section E - E**

HRZ SCALE 1 : 1000

VERT SCALE 1 : 1000

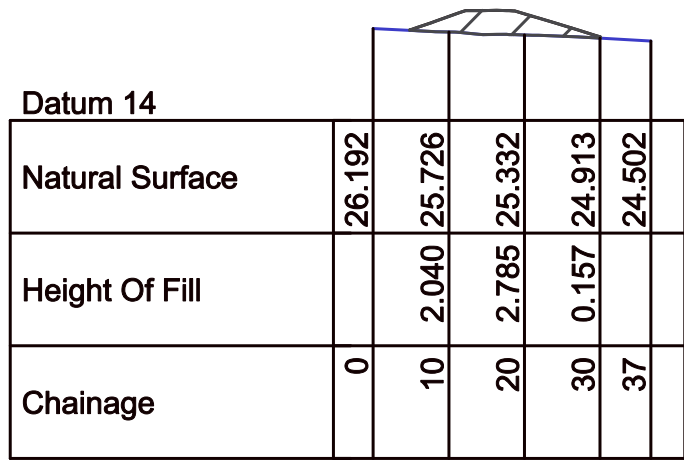
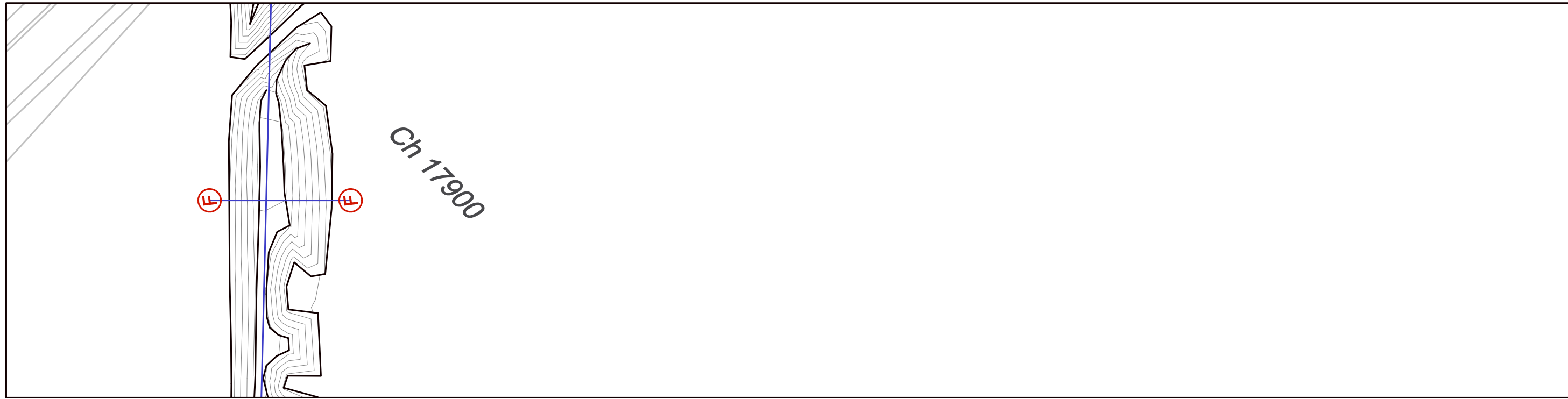
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**Abigroup**  
 ABIGROUP CONTRACTORS  
 Hunter Expressway D&C  
 1004 Old Millbank Road, Dunmore Park, NSW, 2058  
 Ph 02 4958 4000 Fax 02 4958 4001

SURVEYED / DRAWN BY Dan Ripley	PLOT DATE: Thu Nov 14 16:31:27 2013	LOCATION :
CHECKS	Hunter Expressway Graham Lane Section E - E	
VERIFIED	DRAWING STATUS	DRAWING No. 131114
SCALE	REV.	

ABIGROUP CONTRACTORS DRAWING NUMBER 131114





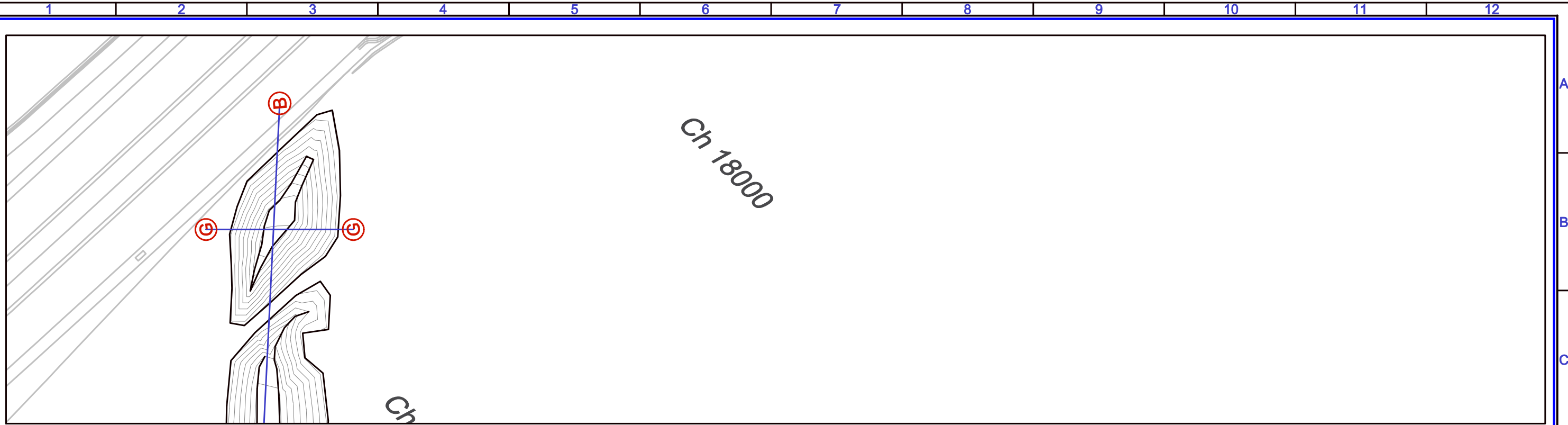
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 VERT SCALE 1 : 1000

REV	ZONE	AMENDMENTS	APP'D	DATE	GENERAL NOTES / REFERENCES

**Abigroup**  
 AMOROP CONTRACTORS  
 Hunter Expressway D&C  
 1004 Old Maitland Road, Sempers Gully, NSW, 2288  
 Ph 02 4958 4000 Fax 02 4958 4001

SURVEYED / DRAWN BY Dan Ripley	PLOT DATE: Thu Nov 14 16:32:03 2013	LOCATION :
CHECKED	Hunter Expressway Graham Lane Section F - F	
VERIFIED	DRAWING STATUS	DRAWING No. 131114
SCALE		REV.

AMOROP STRAIGHTEN DRAWING SECTION 02/06/2007




Datum 13

Natural Surface	25.425	24.973	24.591	24.165	23.828
Height Of Fill		2.042	4.495	1.317	
Chainage	0	10	20	30	37

**Section G - G**  
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 VERT SCALE 1 : 1000

REV	ZONE	AMENDMENTS	APP'D	DATE	GENERAL NOTES / REFERENCES

 <b>ABIGROUP CONTRACTORS</b> Hunter Expressway D&C 1004 Old Millbank Road, Dunmore East, NSW, 2226 Ph 02 4958 4000 Fax 02 4958 4001	SURVEYED / DRAWN BY Dan Ripley	PLOT DATE: Thu Nov 14 16:32:34 2013 LOCATION : Hunter Expressway Graham Lane Section G - G
	CHECKED	
	VERIFIED	
	SCALE	DRAWING STATUS DRAWING No. 131114 REV.

ABIGROUP CONTRACTORS DRAWING NUMBER 131114

## **Appendix B**

### **Site photos**



**Plate 1: Stockpile surface showing mulch**



**Plate 2: Fragment of ceramic identified on surface**



**Plate 3: Excavation in stockpile showing subsurface soils**



**Plate 4: Excavation in stockpile showing spoil**

**Appendix C**  
**Laboratory Reports**

## CERTIFICATE OF ANALYSIS

Work Order	: <b>ES1406229</b>	Page	: 1 of 21
Client	: <b>ENVIRON AUSTRALIA PTY LTD</b>	Laboratory	: Environmental Division Sydney
Contact	: FIONA ROBINSON	Contact	: Client Services
Address	: PO BOX 564 MAITLAND NSW, AUSTRALIA 2320	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: frobinson@environcorp.com.au	E-mail	: sydney@alsglobal.com
Telephone	: +61 02 49344354	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 49344359	Facsimile	: +61-2-8784 8500
Project	: AS130328	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 21-MAR-2014
C-O-C number	: 155081,155082,155083	Issue Date	: 03-APR-2014
Sampler	: SC	No. of samples received	: 27
Site	: ----	No. of samples analysed	: 27
Quote number	: SY/981/13 V2		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits



## General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EA200 Legend**
- **EA200 'Am' Amosite (brown asbestos)**
- **EA200 'Ch' Chrysotile (white asbestos)**
- **EA200 'Cr' Crocidolite (blue asbestos)**
- **EA200 'Trace' - Asbestos fibres detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres**
- **EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.**
- **EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.**
- **EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.**



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

## Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ashesh Patel	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Edwandy Fadjar	Organic Coordinator	Sydney Organics
Hamish Murray	Supervisor - Soils	Newcastle - Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Inorganics
		Sydney Organics
Sanjeshni Jyoti Mala	Senior Chemist Volatile	Sydney Organics





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

Compound	CAS Number	LOR	Unit	COMP1/DISCRETE1	COMP2/DISCRETE2	COMP3/DISCRETE3	COMP4/DISCRETE4	COMP5/DISCRETE5
				21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00
				ES1406229-001	ES1406229-002	ES1406229-003	ES1406229-004	ES1406229-005
<b>EA002 : pH (Soils)</b>								
pH Value	----	0.1	pH Unit	4.8	4.8	4.6	4.8	5.4
<b>EA010: Conductivity</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	229	166	148	156	209
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	12.1	17.1	8.9	8.9	9.5
<b>EA155: Foreign Material - Type III</b>								
Rubber	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Plastic	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Bitumen	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Paint	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Paper	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Cloth	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Wood	----	0.05	%	0.28	0.24	0.24	<0.05	0.17
<b>EG005T: Total Metals by ICP-AES</b>								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	<5
Cadmium	7440-43-9	0.4	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	7440-47-3	2	mg/kg	13	12	7	12	8
Copper	7440-50-8	5	mg/kg	<5	<5	<5	<5	<5
Lead	7439-92-1	5	mg/kg	10	9	8	8	8
Nickel	7440-02-0	2	mg/kg	6	5	3	4	4
Zinc	7440-66-6	5	mg/kg	17	17	8	15	12
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

Compound	CAS Number	LOR	Unit	COMP1/DISCRETE1	COMP2/DISCRETE2	COMP3/DISCRETE3	COMP4/DISCRETE4	COMP5/DISCRETE5
				21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00
				ES1406229-001	ES1406229-002	ES1406229-003	ES1406229-004	ES1406229-005
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	110	113	114	104	109
2-Chlorophenol-D4	93951-73-6	0.1	%	114	119	120	109	118
2,4,6-Tribromophenol	118-79-6	0.1	%	112	100	102	111	95.1
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	117	123	119	111	113



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				COMP1/DISCRETE1	COMP2/DISCRETE2	COMP3/DISCRETE3	COMP4/DISCRETE4	COMP5/DISCRETE5
				21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00
Compound	CAS Number	LOR	Unit	ES1406229-001	ES1406229-002	ES1406229-003	ES1406229-004	ES1406229-005
<b>EP075(SIM)T: PAH Surrogates - Continued</b>								
Anthracene-d10	1719-06-8	0.1	%	98.1	105	107	98.3	105
4-Terphenyl-d14	1718-51-0	0.1	%	118	123	120	115	123
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	88.1	95.8	98.1	96.3	97.9
Toluene-D8	2037-26-5	0.1	%	99.0	101	104	101	103
4-Bromofluorobenzene	460-00-4	0.1	%	122	105	107	102	104



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

Compound	CAS Number	LOR	Unit	COMP6/DISCRETE6	COMP7/DISCRETE7	COMP8/DISCRETE8	COMP9/DISCRETE9	COMP10/DISCRETE10
				21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00
				ES1406229-006	ES1406229-007	ES1406229-008	ES1406229-009	ES1406229-010
<b>EA002 : pH (Soils)</b>								
pH Value	----	0.1	pH Unit	6.3	5.0	4.5	6.2	4.8
<b>EA010: Conductivity</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	366	239	160	321	205
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	16.1	13.9	11.6	12.4	14.1
<b>EA155: Foreign Material - Type III</b>								
Rubber	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Plastic	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Bitumen	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Paint	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Paper	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Cloth	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Wood	----	0.05	%	<0.05	0.12	<0.05	<0.05	0.17
<b>EG005T: Total Metals by ICP-AES</b>								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	<5
Cadmium	7440-43-9	0.4	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	7440-47-3	2	mg/kg	4	11	12	8	14
Copper	7440-50-8	5	mg/kg	<5	<5	<5	<5	<5
Lead	7439-92-1	5	mg/kg	5	8	9	8	10
Nickel	7440-02-0	2	mg/kg	3	4	4	2	4
Zinc	7440-66-6	5	mg/kg	<5	16	15	11	12
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

Compound	CAS Number	LOR	Unit	COMP6/DISCRETE6	COMP7/DISCRETE7	COMP8/DISCRETE8	COMP9/DISCRETE9	COMP10/DISCRETE10
				21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00
				ES1406229-006	ES1406229-007	ES1406229-008	ES1406229-009	ES1406229-010
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	104	113	116	114	110
2-Chlorophenol-D4	93951-73-6	0.1	%	116	115	117	117	116
2,4,6-Tribromophenol	118-79-6	0.1	%	114	111	104	107	93.4
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	114	119	114	118	118



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				COMP6/DISCRETE6	COMP7/DISCRETE7	COMP8/DISCRETE8	COMP9/DISCRETE9	COMP10/DISCRETE10
				21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00
Compound	CAS Number	LOR	Unit	ES1406229-006	ES1406229-007	ES1406229-008	ES1406229-009	ES1406229-010
<b>EP075(SIM)T: PAH Surrogates - Continued</b>								
Anthracene-d10	1719-06-8	0.1	%	97.9	98.8	99.9	97.3	102
4-Terphenyl-d14	1718-51-0	0.1	%	121	118	119	118	121
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	95.3	90.3	92.6	93.6	98.8
Toluene-D8	2037-26-5	0.1	%	99.4	96.4	95.8	93.5	93.5
4-Bromofluorobenzene	460-00-4	0.1	%	102	102	96.4	96.4	96.1



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

Compound	CAS Number	LOR	Unit	COMP11/DISCRETE11	COMP12/DISCRETE12	COMP13/DISCRETE13	COMP14/DISCRETE14	COMP15/DISCRETE15
				21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00
				ES1406229-011	ES1406229-012	ES1406229-013	ES1406229-014	ES1406229-015
<b>EA002 : pH (Soils)</b>								
pH Value	----	0.1	pH Unit	4.6	5.8	5.9	4.9	4.9
<b>EA010: Conductivity</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	127	280	235	182	206
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	19.5	11.8	9.7	25.6	8.3
<b>EA155: Foreign Material - Type III</b>								
Rubber	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Plastic	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Bitumen	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Paint	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Paper	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Cloth	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Wood	----	0.05	%	0.15	0.12	<0.05	0.21	0.41
<b>EG005T: Total Metals by ICP-AES</b>								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	<5
Cadmium	7440-43-9	0.4	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	7440-47-3	2	mg/kg	14	16	15	14	8
Copper	7440-50-8	5	mg/kg	<5	<5	<5	<5	<5
Lead	7439-92-1	5	mg/kg	10	10	10	10	7
Nickel	7440-02-0	2	mg/kg	5	6	5	6	3
Zinc	7440-66-6	5	mg/kg	18	18	16	18	8
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

Compound	CAS Number	LOR	Unit	COMP11/DISCRETE11	COMP12/DISCRETE12	COMP13/DISCRETE13	COMP14/DISCRETE14	COMP15/DISCRETE15
				21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00
				ES1406229-011	ES1406229-012	ES1406229-013	ES1406229-014	ES1406229-015
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	111	112	113	114	112
2-Chlorophenol-D4	93951-73-6	0.1	%	117	117	118	120	118
2,4,6-Tribromophenol	118-79-6	0.1	%	106	125	125	127	94.6
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	115	114	116	118	116





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				COMP11/DISCRETE11	COMP12/DISCRETE12	COMP13/DISCRETE13	COMP14/DISCRETE14	COMP15/DISCRETE15
				21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00
Compound	CAS Number	LOR	Unit	ES1406229-011	ES1406229-012	ES1406229-013	ES1406229-014	ES1406229-015
<b>EP075(SIM)T: PAH Surrogates - Continued</b>								
Anthracene-d10	1719-06-8	0.1	%	102	104	102	104	104
4-Terphenyl-d14	1718-51-0	0.1	%	120	117	119	122	120
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	80.4	112	106	102	106
Toluene-D8	2037-26-5	0.1	%	80.8	108	98.9	84.3	100
4-Bromofluorobenzene	460-00-4	0.1	%	91.9	111	94.4	89.0	91.4



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

Compound	CAS Number	LOR	Unit	COMP16/DISCRETE16	COMP17/DISCRETE17	COMP18/DISCRETE18	COMP19/DISCRETE19	COMP20/DISCRETE20
				21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00
				ES1406229-016	ES1406229-017	ES1406229-018	ES1406229-019	ES1406229-020
<b>EA002 : pH (Soils)</b>								
pH Value	----	0.1	pH Unit	4.7	6.2	6.9	6.0	5.7
<b>EA010: Conductivity</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	119	636	531	205	366
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	9.8	14.2	14.4	18.0	14.4
<b>EA155: Foreign Material - Type III</b>								
Rubber	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Plastic	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Bitumen	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Paint	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Paper	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Cloth	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Wood	----	0.05	%	0.74	0.05	0.07	0.12	<0.05
<b>EG005T: Total Metals by ICP-AES</b>								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	<5
Cadmium	7440-43-9	0.4	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	7440-47-3	2	mg/kg	11	6	8	15	6
Copper	7440-50-8	5	mg/kg	<5	<5	<5	<5	<5
Lead	7439-92-1	5	mg/kg	9	6	7	8	7
Nickel	7440-02-0	2	mg/kg	4	3	4	6	2
Zinc	7440-66-6	5	mg/kg	14	6	20	15	9
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

Compound	CAS Number	LOR	Unit	COMP16/DISCRETE16	COMP17/DISCRETE17	COMP18/DISCRETE18	COMP19/DISCRETE19	COMP20/DISCRETE20
				21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00
				ES1406229-016	ES1406229-017	ES1406229-018	ES1406229-019	ES1406229-020
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	105	111	119	107	109
2-Chlorophenol-D4	93951-73-6	0.1	%	115	117	114	112	118
2,4,6-Tribromophenol	118-79-6	0.1	%	98.9	114	102	120	113
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	108	109	120	110	118



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				COMP16/DISCRETE16	COMP17/DISCRETE17	COMP18/DISCRETE18	COMP19/DISCRETE19	COMP20/DISCRETE20
				21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00
Compound	CAS Number	LOR	Unit	ES1406229-016	ES1406229-017	ES1406229-018	ES1406229-019	ES1406229-020
<b>EP075(SIM)T: PAH Surrogates - Continued</b>								
Anthracene-d10	1719-06-8	0.1	%	96.4	98.1	108	99.2	102
4-Terphenyl-d14	1718-51-0	0.1	%	109	114	119	115	119
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	103	102	96.8	91.0	89.8
Toluene-D8	2037-26-5	0.1	%	99.1	97.2	91.3	92.7	105
4-Bromofluorobenzene	460-00-4	0.1	%	94.6	92.8	97.9	92.6	103



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

Compound	CAS Number	LOR	Unit	COMP21/DISCRETE21	COMP22/DISCRETE22	COMP23/DISCRETE23	COMP24/DISCRETE24	COMP25/DISCRETE25
				21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00
				ES1406229-021	ES1406229-022	ES1406229-023	ES1406229-024	ES1406229-025
<b>EA002 : pH (Soils)</b>								
pH Value	----	0.1	pH Unit	6.2	6.0	5.5	5.0	5.3
<b>EA010: Conductivity</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	363	221	234	122	261
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	12.4	17.6	17.6	11.7	9.0
<b>EA155: Foreign Material - Type III</b>								
Rubber	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Plastic	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Bitumen	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Paint	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Paper	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Cloth	----	0.05	%	<0.05	<0.05	<0.05	<0.05	<0.05
Wood	----	0.05	%	<0.05	0.16	<0.05	0.06	0.15
<b>EG005T: Total Metals by ICP-AES</b>								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	<5
Cadmium	7440-43-9	0.4	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	7440-47-3	2	mg/kg	10	8	12	12	5
Copper	7440-50-8	5	mg/kg	<5	<5	<5	<5	<5
Lead	7439-92-1	5	mg/kg	8	9	8	8	5
Nickel	7440-02-0	2	mg/kg	3	3	4	5	2
Zinc	7440-66-6	5	mg/kg	13	8	14	15	<5
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

Compound	CAS Number	LOR	Unit	COMP21/DISCRETE21	COMP22/DISCRETE22	COMP23/DISCRETE23	COMP24/DISCRETE24	COMP25/DISCRETE25
				21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00
				ES1406229-021	ES1406229-022	ES1406229-023	ES1406229-024	ES1406229-025
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	90.8	91.1	84.6	82.4	85.6
2-Chlorophenol-D4	93951-73-6	0.1	%	92.4	94.0	88.1	83.5	89.1
2,4,6-Tribromophenol	118-79-6	0.1	%	112	93.3	101	105	105
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	90.0	87.3	87.0	81.2	83.7



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				COMP21/DISCRETE21	COMP22/DISCRETE22	COMP23/DISCRETE23	COMP24/DISCRETE24	COMP25/DISCRETE25
				21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00	21-MAR-2014 15:00
Compound	CAS Number	LOR	Unit	ES1406229-021	ES1406229-022	ES1406229-023	ES1406229-024	ES1406229-025
<b>EP075(SIM)T: PAH Surrogates - Continued</b>								
Anthracene-d10	1719-06-8	0.1	%	91.4	91.3	85.0	83.1	87.1
4-Terphenyl-d14	1718-51-0	0.1	%	83.3	90.5	83.0	78.5	83.7
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	93.8	90.0	77.7	96.2	103
Toluene-D8	2037-26-5	0.1	%	118	109	122	119	112
4-Bromofluorobenzene	460-00-4	0.1	%	94.4	94.3	91.8	93.9	93.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

COMP26/DISCRETE26	COMP27/DISCRETE27	---	---	---
21-MAR-2014 15:00	21-MAR-2014 15:00	---	---	---

Client sampling date / time

ES1406229-026	ES1406229-027	---	---	---
---------------	---------------	-----	-----	-----

Compound	CAS Number	LOR	Unit	ES1406229-026	ES1406229-027	---	---	---
<b>EA002 : pH (Soils)</b>								
pH Value	---	0.1	pH Unit	4.8	6.0	---	---	---
<b>EA010: Conductivity</b>								
Electrical Conductivity @ 25°C	---	1	µS/cm	151	261	---	---	---
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	---	1.0	%	10.6	10.5	---	---	---
<b>EA155: Foreign Material - Type III</b>								
Rubber	---	0.05	%	<0.05	<0.05	---	---	---
Plastic	---	0.05	%	<0.05	<0.05	---	---	---
Bitumen	---	0.05	%	<0.05	<0.05	---	---	---
Paint	---	0.05	%	<0.05	<0.05	---	---	---
Paper	---	0.05	%	<0.05	<0.05	---	---	---
Cloth	---	0.05	%	<0.05	<0.05	---	---	---
Wood	---	0.05	%	0.05	0.08	---	---	---
<b>EG005T: Total Metals by ICP-AES</b>								
Arsenic	7440-38-2	5	mg/kg	<5	<5	---	---	---
Cadmium	7440-43-9	0.4	mg/kg	<0.4	<0.4	---	---	---
Chromium	7440-47-3	2	mg/kg	8	7	---	---	---
Copper	7440-50-8	5	mg/kg	<5	<5	---	---	---
Lead	7439-92-1	5	mg/kg	7	7	---	---	---
Nickel	7440-02-0	2	mg/kg	3	3	---	---	---
Zinc	7440-66-6	5	mg/kg	9	9	---	---	---
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	---	---	---
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	---	---	---
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	---	---	---
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	---	---	---
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	---	---	---
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	---	---	---
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	---	---	---
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	---	---	---
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	---	---	---
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	---	---	---





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time	COMP26/DISCRETE26	COMP27/DISCRETE27			
21-MAR-2014 15:00			----	----	----
	ES1406229-026	ES1406229-027	----	----	----

Compound	CAS Number	LOR	Unit	ES1406229-026	ES1406229-027			
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	----	----	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	----	----	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	----	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	----	----	----
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	----	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	88.0	86.2	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	88.8	87.6	----	----	----
2,4,6-Tribromophenol	118-79-6	0.1	%	115	102	----	----	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	87.8	84.3	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sample ID	COMP26/DISCRETE26	COMP27/DISCRETE27			
21-MAR-2014 15:00			----	----	----
21-MAR-2014 15:00	ES1406229-026	ES1406229-027	----	----	----

Client sampling date / time

Compound	CAS Number	LOR	Unit	ES1406229-026	ES1406229-027			
<b>EP075(SIM)T: PAH Surrogates - Continued</b>								
Anthracene-d10	1719-06-8	0.1	%	87.1	85.4	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	83.3	78.8	----	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	90.7	94.5	----	----	----
Toluene-D8	2037-26-5	0.1	%	104	96.5	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	88.4	81.9	----	----	----



## Surrogate Control Limits

Sub-Matrix: 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	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: ES1406229</b>	<b>Page</b>	: 1 of 13
<b>Client</b>	<b>: ENVIRON AUSTRALIA PTY LTD</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	<b>: FIONA ROBINSON</b>	<b>Contact</b>	: Client Services
<b>Address</b>	<b>: PO BOX 564 MAITLAND NSW, AUSTRALIA 2320</b>	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	<b>: frobinson@environcorp.com.au</b>	<b>E-mail</b>	: sydney@alsglobal.com
<b>Telephone</b>	<b>: +61 02 49344354</b>	<b>Telephone</b>	: +61-2-8784 8555
<b>Facsimile</b>	<b>: +61 02 49344359</b>	<b>Facsimile</b>	: +61-2-8784 8500
<b>Project</b>	<b>: AS130328</b>	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	<b>: ----</b>	<b>Date Samples Received</b>	: 21-MAR-2014
<b>C-O-C number</b>	<b>: 155081,155082,155083</b>	<b>Issue Date</b>	: 03-APR-2014
<b>Sampler</b>	<b>: SC</b>	<b>No. of samples received</b>	: 27
<b>Order number</b>	<b>: ----</b>	<b>No. of samples analysed</b>	: 27
<b>Quote number</b>	<b>: SY/981/13 V2</b>		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

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



## General Comments

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

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

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

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

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



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

## Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ashesh Patel	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Edwandy Fadjjar	Organic Coordinator	Sydney Organics
Hamish Murray	Supervisor - Soils	Newcastle - Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Inorganics
		Sydney Organics
Sanjeshni Jyoti Mala	Senior Chemist Volatile	Sydney Organics



## Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				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: 3365941)</b>									
ES1406229-001	COMP1/DISCRETE1	EA002: pH Value	----	0.1	pH Unit	4.8	4.8	0.0	0% - 20%
ES1406229-011	COMP11/DISCRETE11	EA002: pH Value	----	0.1	pH Unit	4.6	4.6	0.0	0% - 20%
<b>EA002 : pH (Soils) (QC Lot: 3365943)</b>									
ES1406229-021	COMP21/DISCRETE21	EA002: pH Value	----	0.1	pH Unit	6.2	6.2	0.0	0% - 20%
ES1406306-001	Anonymous	EA002: pH Value	----	0.1	pH Unit	5.1	5.1	0.0	0% - 20%
<b>EA010: Conductivity (QC Lot: 3365942)</b>									
ES1406229-001	COMP1/DISCRETE1	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	229	229	0.0	0% - 20%
ES1406229-011	COMP11/DISCRETE11	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	127	127	0.0	0% - 20%
<b>EA010: Conductivity (QC Lot: 3365944)</b>									
ES1406229-021	COMP21/DISCRETE21	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	363	363	0.0	0% - 20%
ES1406306-001	Anonymous	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	607	607	0.0	0% - 20%
<b>EA055: Moisture Content (QC Lot: 3364059)</b>									
ES1406229-003	COMP3/DISCRETE3	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	8.9	8.6	3.3	No Limit
ES1406229-014	COMP14/DISCRETE14	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	25.6	29.9	15.7	0% - 20%
<b>EA055: Moisture Content (QC Lot: 3364060)</b>									
ES1406229-023	COMP23/DISCRETE23	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	17.6	16.1	8.8	0% - 50%
ES1406456-004	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	17.8	18.6	4.4	0% - 50%
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3366024)</b>									
ES1406229-001	COMP1/DISCRETE1	EG005T-MW: Cadmium	7440-43-9	0.4	mg/kg	<0.4	<0.4	0.0	No Limit
		EG005T-MW: Chromium	7440-47-3	2	mg/kg	13	14	7.5	No Limit
		EG005T-MW: Nickel	7440-02-0	2	mg/kg	6	6	0.0	No Limit
		EG005T-MW: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T-MW: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T-MW: Lead	7439-92-1	5	mg/kg	10	11	12.2	No Limit
		EG005T-MW: Zinc	7440-66-6	5	mg/kg	17	18	6.4	No Limit
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3366027)</b>									
ES1406229-021	COMP21/DISCRETE21	EG005T-MW: Cadmium	7440-43-9	0.4	mg/kg	<0.4	<0.4	0.0	No Limit
		EG005T-MW: Chromium	7440-47-3	2	mg/kg	10	10	0.0	No Limit
		EG005T-MW: Nickel	7440-02-0	2	mg/kg	3	5	34.2	No Limit
		EG005T-MW: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T-MW: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T-MW: Lead	7439-92-1	5	mg/kg	8	8	0.0	No Limit
		EG005T-MW: Zinc	7440-66-6	5	mg/kg	13	15	15.1	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3366023)</b>									



Sub-Matrix: 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>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3366023) - continued</b>									
ES1406229-001	COMP1/DISCRETE1	EG035T-MW: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1406229-011	COMP11/DISCRETE11	EG035T-MW: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3366025)</b>									
ES1406229-021	COMP21/DISCRETE21	EG035T-MW: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3356990)</b>									
ES1406229-001	COMP1/DISCRETE1	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
ES1406229-011	COMP11/DISCRETE11	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: 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)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3356990) - continued</b>									
ES1406229-011	COMP11/DISCRETE11	EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3357396)</b>									
ES1406229-021	COMP21/DISCRETE21	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		ES1406306-003	Anonymous	EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5
EP075(SIM): Benzo(a)pyrene TEQ (zero)	----			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1406306-003	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		





Sub-Matrix: 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)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3357396) - continued</b>									
ES1406306-003	Anonymous	EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3356989)</b>									
ES1406229-001	COMP1/DISCRETE1	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1406229-011	COMP11/DISCRETE11	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3357393)</b>									
ES1406229-021	COMP21/DISCRETE21	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1406306-003	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3356989)</b>									
ES1406229-001	COMP1/DISCRETE1	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
ES1406229-011	COMP11/DISCRETE11	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3357393)</b>									
ES1406229-021	COMP21/DISCRETE21	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
ES1406306-003	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3356992)</b>									
ES1406229-001	COMP1/DISCRETE1	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
ES1406229-011	COMP11/DISCRETE11	EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: 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>EP080: BTEXN (QC Lot: 3356992) - continued</b>									
ES1406229-011	COMP11/DISCRETE11	EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3357407)</b>									
ES1406229-021	COMP21/DISCRETE21	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1406306-003	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



## Method Blank (MB) and Laboratory Control Spike (LCS) Report

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

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EA010: Conductivity (QCLot: 3365942)</b>									
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	99.8	70	130	
<b>EA010: Conductivity (QCLot: 3365944)</b>									
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	99.8	70	130	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3366024)</b>									
EG005T-MW: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	96.9	84	122	
EG005T-MW: Cadmium	7440-43-9	0.4	mg/kg	<0.4	4.64 mg/kg	99.9	84	124	
EG005T-MW: Chromium	7440-47-3	2	mg/kg	<2	63.9 mg/kg	122	81	129	
EG005T-MW: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	105	90	134	
EG005T-MW: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	102	83	127	
EG005T-MW: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	113	81	125	
EG005T-MW: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	104	85	133	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3366027)</b>									
EG005T-MW: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	97.7	84	122	
EG005T-MW: Cadmium	7440-43-9	0.4	mg/kg	<0.4	4.64 mg/kg	101	84	124	
EG005T-MW: Chromium	7440-47-3	2	mg/kg	<2	63.9 mg/kg	124	81	129	
EG005T-MW: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	108	90	134	
EG005T-MW: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	102	83	127	
EG005T-MW: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	120	81	125	
EG005T-MW: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	105	85	133	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3366023)</b>									
EG035T-MW: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	80.9	76	112	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3366025)</b>									
EG035T-MW: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	82.8	76	112	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3356990)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	103	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	98.8	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	93.8	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	94.9	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	96.2	79	123	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	94.8	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	89.7	79	123	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	89.2	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	95.0	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	101	81	123	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3356990) - continued</b>									
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	97.3	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	94.6	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	88.6	76	122	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	93.5	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	91.1	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	94.8	72.4	114	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3357396)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	91.5	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	90.5	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	93.4	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	88.6	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	95.0	79	123	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	94.0	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	105	79	123	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	108	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	84.2	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	88.5	81	123	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	87.1	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	88.8	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	85.8	76	122	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	71.9	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	80.1	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	77.9	72.4	114	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3356989)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	93.8	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	103	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	102	64	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3357393)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	98.8	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	107	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	112	64	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3356989)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	103	70	130	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	102	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
		50	mg/kg	----	150 mg/kg	103	63	131	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3357393)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	103	70	130	



Sub-Matrix: **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 (QCLot: 3357393) - continued</b>								
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	108	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
		50	mg/kg	----	150 mg/kg	114	63	131
<b>EP080: BTEXN (QCLot: 3356992)</b>								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	111	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	114	62	128
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	111	58	118
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	108	60	120
	106-42-3							
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	113	60	120
<b>EP080: BTEXN (QCLot: 3357407)</b>								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	93.8	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	116	62	128
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	87.2	58	118
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	85.4	60	120
	106-42-3							
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	91.4	60	120

**Matrix Spike (MS) Report**

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%)	Recovery Limits (%)	
					MS	Low	High
<b>EG005T: Total Metals by ICP-AES (QCLot: 3366024)</b>							
ES1406229-001	COMP1/DISCRETE1	EG005T-MW: Arsenic	7440-38-2	50 mg/kg	92.9	70	130
		EG005T-MW: Cadmium	7440-43-9	50 mg/kg	94.9	70	130
		EG005T-MW: Chromium	7440-47-3	50 mg/kg	94.3	70	130
		EG005T-MW: Copper	7440-50-8	125 mg/kg	100	70	130
		EG005T-MW: Lead	7439-92-1	125 mg/kg	94.0	70	130
		EG005T-MW: Nickel	7440-02-0	50 mg/kg	95.7	70	130
		EG005T-MW: Zinc	7440-66-6	125 mg/kg	92.8	70	130
<b>EG005T: Total Metals by ICP-AES (QCLot: 3366027)</b>							
ES1406229-021	COMP21/DISCRETE21	EG005T-MW: Arsenic	7440-38-2	50 mg/kg	95.1	70	130
		EG005T-MW: Cadmium	7440-43-9	50 mg/kg	101	70	130
		EG005T-MW: Chromium	7440-47-3	50 mg/kg	107	70	130
		EG005T-MW: Copper	7440-50-8	125 mg/kg	107	70	130
		EG005T-MW: Lead	7439-92-1	125 mg/kg	101	70	130



Sub-Matrix: SOIL

				Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EG005T: Total Metals by ICP-AES (QCLot: 3366027) - continued</b>							
ES1406229-021	COMP21/DISCRETE21	EG005T-MW: Nickel	7440-02-0	50 mg/kg	94.3	70	130
		EG005T-MW: Zinc	7440-66-6	125 mg/kg	103	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3366023)</b>							
ES1406229-001	COMP1/DISCRETE1	EG035T-MW: Mercury	7439-97-6	5 mg/kg	73.0	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3366025)</b>							
ES1406229-021	COMP21/DISCRETE21	EG035T-MW: Mercury	7439-97-6	5 mg/kg	78.7	70	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3356990)</b>							
ES1406229-001	COMP1/DISCRETE1	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	95.2	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	89.7	70	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3357396)</b>							
ES1406229-021	COMP21/DISCRETE21	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	88.3	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	98.2	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3356989)</b>							
ES1406229-001	COMP1/DISCRETE1	EP071: C10 - C14 Fraction	----	640 mg/kg	83.9	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	83.4	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	85.0	52	132
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3357393)</b>							
ES1406229-021	COMP21/DISCRETE21	EP071: C10 - C14 Fraction	----	640 mg/kg	75.8	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	104	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	118	52	132
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3356989)</b>							
ES1406229-001	COMP1/DISCRETE1	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	104	73	137
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	81.6	53	131
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	78.4	52	132
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3357393)</b>							
ES1406229-021	COMP21/DISCRETE21	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	103	73	137
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	105	53	131
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	99.2	52	132
<b>EP080: BTEXN (QCLot: 3356992)</b>							
ES1406229-001	COMP1/DISCRETE1	EP080: Benzene	71-43-2	2.5 mg/kg	88.8	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	102	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	102	70	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	103	70	130
		EP080: ortho-Xylene	106-42-3	2.5 mg/kg	102	70	130
<b>EP080: BTEXN (QCLot: 3357407)</b>							



Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EP080: BTEXN (QCLot: 3357407) - continued</b>							
ES1406229-021	COMP21/DISCRETE21	EP080: Benzene	71-43-2	2.5 mg/kg	105	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	119	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	100	70	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	101	70	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	104	70	130

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

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

Sub-Matrix: SOIL				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3356989)</b>										
ES1406229-001	COMP1/DISCRETE1	EP071: C10 - C14 Fraction	----	640 mg/kg	83.9	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	3140 mg/kg	83.4	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	2860 mg/kg	85.0	----	52	132	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3356989)</b>										
ES1406229-001	COMP1/DISCRETE1	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	104	----	73	137	----	----
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	81.6	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	78.4	----	52	132	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3356990)</b>										
ES1406229-001	COMP1/DISCRETE1	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	95.2	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	89.7	----	70	130	----	----
<b>EP080: BTEXN (QCLot: 3356992)</b>										
ES1406229-001	COMP1/DISCRETE1	EP080: Benzene	71-43-2	2.5 mg/kg	88.8	----	70	130	----	----
		EP080: Toluene	108-88-3	2.5 mg/kg	102	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	102	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	103	----	70	130	----	----
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	102	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3357393)</b>										
ES1406229-021	COMP21/DISCRETE21	EP071: C10 - C14 Fraction	----	640 mg/kg	75.8	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	3140 mg/kg	104	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	2860 mg/kg	118	----	52	132	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3357393)</b>										
ES1406229-021	COMP21/DISCRETE21	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	103	----	73	137	----	----



Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3357393) - continued</b>										
ES1406229-021	COMP21/DISCRETE21	EP071: >C16 - C34 Fraction	----	4800 mg/kg	105	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	99.2	----	52	132	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3357396)</b>										
ES1406229-021	COMP21/DISCRETE21	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	88.3	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	98.2	----	70	130	----	----
<b>EP080: BTEXN (QCLot: 3357407)</b>										
ES1406229-021	COMP21/DISCRETE21	EP080: Benzene	71-43-2	2.5 mg/kg	105	----	70	130	----	----
		EP080: Toluene	108-88-3	2.5 mg/kg	119	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	100	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	101	----	70	130	----	----
		EP080: ortho-Xylene	106-42-3 95-47-6	2.5 mg/kg	104	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3366023)</b>										
ES1406229-001	COMP1/DISCRETE1	EG035T-MW: Mercury	7439-97-6	5 mg/kg	73.0	----	70	130	----	----
<b>EG005T: Total Metals by ICP-AES (QCLot: 3366024)</b>										
ES1406229-001	COMP1/DISCRETE1	EG005T-MW: Arsenic	7440-38-2	50 mg/kg	92.9	----	70	130	----	----
		EG005T-MW: Cadmium	7440-43-9	50 mg/kg	94.9	----	70	130	----	----
		EG005T-MW: Chromium	7440-47-3	50 mg/kg	94.3	----	70	130	----	----
		EG005T-MW: Copper	7440-50-8	125 mg/kg	100	----	70	130	----	----
		EG005T-MW: Lead	7439-92-1	125 mg/kg	94.0	----	70	130	----	----
		EG005T-MW: Nickel	7440-02-0	50 mg/kg	95.7	----	70	130	----	----
		EG005T-MW: Zinc	7440-66-6	125 mg/kg	92.8	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3366025)</b>										
ES1406229-021	COMP21/DISCRETE21	EG035T-MW: Mercury	7439-97-6	5 mg/kg	78.7	----	70	130	----	----
<b>EG005T: Total Metals by ICP-AES (QCLot: 3366027)</b>										
ES1406229-021	COMP21/DISCRETE21	EG005T-MW: Arsenic	7440-38-2	50 mg/kg	95.1	----	70	130	----	----
		EG005T-MW: Cadmium	7440-43-9	50 mg/kg	101	----	70	130	----	----
		EG005T-MW: Chromium	7440-47-3	50 mg/kg	107	----	70	130	----	----
		EG005T-MW: Copper	7440-50-8	125 mg/kg	107	----	70	130	----	----
		EG005T-MW: Lead	7439-92-1	125 mg/kg	101	----	70	130	----	----
		EG005T-MW: Nickel	7440-02-0	50 mg/kg	94.3	----	70	130	----	----
		EG005T-MW: Zinc	7440-66-6	125 mg/kg	103	----	70	130	----	----



## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1406229</b>	Page	: 1 of 10
Client	: ENVIRON AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: FIONA ROBINSON	Contact	: Client Services
Address	: PO BOX 564 MAITLAND NSW, AUSTRALIA 2320	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
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Facsimile	: +61 02 49344359	Facsimile	: +61-2-8784 8500
Project	: AS130328	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 21-MAR-2014
C-O-C number	: 155081,155082,155083	Issue Date	: 03-APR-2014
Sampler	: SC	No. of samples received	: 27
Order number	: ----	No. of samples analysed	: 27
Quote number	: SY/981/13 V2		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

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

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

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

Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EA002 : pH (Soils)</b>								
<b>Soil Glass Jar - Unpreserved (EA002)</b>								
COMP1/DISCRETE1, COMP3/DISCRETE3, COMP5/DISCRETE5, COMP7/DISCRETE7, COMP9/DISCRETE9, COMP11/DISCRETE11, COMP13/DISCRETE13, COMP15/DISCRETE15, COMP17/DISCRETE17, COMP19/DISCRETE19, COMP21/DISCRETE21, COMP23/DISCRETE23, COMP25/DISCRETE25, COMP27/DISCRETE27	COMP2/DISCRETE2, COMP4/DISCRETE4, COMP6/DISCRETE6, COMP8/DISCRETE8, COMP10/DISCRETE10, COMP12/DISCRETE12, COMP14/DISCRETE14, COMP16/DISCRETE16, COMP18/DISCRETE18, COMP20/DISCRETE20, COMP22/DISCRETE22, COMP24/DISCRETE24, COMP26/DISCRETE26,	21-MAR-2014	31-MAR-2014	28-MAR-2014	*	28-MAR-2014	31-MAR-2014	✓
<b>EA010: Conductivity</b>								
<b>Soil Glass Jar - Unpreserved (EA010)</b>								
COMP1/DISCRETE1, COMP3/DISCRETE3, COMP5/DISCRETE5, COMP7/DISCRETE7, COMP9/DISCRETE9, COMP11/DISCRETE11, COMP13/DISCRETE13, COMP15/DISCRETE15, COMP17/DISCRETE17, COMP19/DISCRETE19, COMP21/DISCRETE21, COMP23/DISCRETE23, COMP25/DISCRETE25, COMP27/DISCRETE27	COMP2/DISCRETE2, COMP4/DISCRETE4, COMP6/DISCRETE6, COMP8/DISCRETE8, COMP10/DISCRETE10, COMP12/DISCRETE12, COMP14/DISCRETE14, COMP16/DISCRETE16, COMP18/DISCRETE18, COMP20/DISCRETE20, COMP22/DISCRETE22, COMP24/DISCRETE24, COMP26/DISCRETE26,	21-MAR-2014	31-MAR-2014	28-MAR-2014	*	29-MAR-2014	28-APR-2014	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EA055: Moisture Content</b>								
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> COMP1/DISCRETE1, COMP3/DISCRETE3, COMP5/DISCRETE5, COMP7/DISCRETE7, COMP9/DISCRETE9, COMP11/DISCRETE11, COMP13/DISCRETE13, COMP15/DISCRETE15, COMP17/DISCRETE17, COMP19/DISCRETE19, COMP21/DISCRETE21, COMP23/DISCRETE23, COMP25/DISCRETE25, COMP27/DISCRETE27	COMP2/DISCRETE2, COMP4/DISCRETE4, COMP6/DISCRETE6, COMP8/DISCRETE8, COMP10/DISCRETE10, COMP12/DISCRETE12, COMP14/DISCRETE14, COMP16/DISCRETE16, COMP18/DISCRETE18, COMP20/DISCRETE20, COMP22/DISCRETE22, COMP24/DISCRETE24, COMP26/DISCRETE26,	21-MAR-2014	----	----	----	28-MAR-2014	04-APR-2014	✓
<b>EA155: Foreign Material - Type III</b>								
<b>Snap Lock Bag (EA155)</b> COMP1/DISCRETE1, COMP3/DISCRETE3, COMP5/DISCRETE5, COMP7/DISCRETE7, COMP9/DISCRETE9, COMP11/DISCRETE11, COMP13/DISCRETE13, COMP15/DISCRETE15, COMP17/DISCRETE17, COMP19/DISCRETE19, COMP21/DISCRETE21, COMP23/DISCRETE23, COMP25/DISCRETE25, COMP27/DISCRETE27	COMP2/DISCRETE2, COMP4/DISCRETE4, COMP6/DISCRETE6, COMP8/DISCRETE8, COMP10/DISCRETE10, COMP12/DISCRETE12, COMP14/DISCRETE14, COMP16/DISCRETE16, COMP18/DISCRETE18, COMP20/DISCRETE20, COMP22/DISCRETE22, COMP24/DISCRETE24, COMP26/DISCRETE26,	21-MAR-2014	----	----	----	02-APR-2014	17-SEP-2014	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EG005T: Total Metals by ICP-AES</b>							
<b>Soil Glass Jar - Unpreserved (EG005T-MW)</b> COMP1/DISCRETE1, COMP3/DISCRETE3, COMP5/DISCRETE5, COMP7/DISCRETE7, COMP9/DISCRETE9, COMP11/DISCRETE11, COMP13/DISCRETE13, COMP15/DISCRETE15, COMP17/DISCRETE17, COMP19/DISCRETE19, COMP21/DISCRETE21, COMP23/DISCRETE23, COMP25/DISCRETE25, COMP27/DISCRETE27 COMP2/DISCRETE2, COMP4/DISCRETE4, COMP6/DISCRETE6, COMP8/DISCRETE8, COMP10/DISCRETE10, COMP12/DISCRETE12, COMP14/DISCRETE14, COMP16/DISCRETE16, COMP18/DISCRETE18, COMP20/DISCRETE20, COMP22/DISCRETE22, COMP24/DISCRETE24, COMP26/DISCRETE26,	21-MAR-2014	31-MAR-2014	17-SEP-2014	✓	31-MAR-2014	17-SEP-2014	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>							
<b>Soil Glass Jar - Unpreserved (EG035T-MW)</b> COMP1/DISCRETE1, COMP3/DISCRETE3, COMP5/DISCRETE5, COMP7/DISCRETE7, COMP9/DISCRETE9, COMP11/DISCRETE11, COMP13/DISCRETE13, COMP15/DISCRETE15, COMP17/DISCRETE17, COMP19/DISCRETE19, COMP21/DISCRETE21, COMP23/DISCRETE23, COMP25/DISCRETE25, COMP27/DISCRETE27 COMP2/DISCRETE2, COMP4/DISCRETE4, COMP6/DISCRETE6, COMP8/DISCRETE8, COMP10/DISCRETE10, COMP12/DISCRETE12, COMP14/DISCRETE14, COMP16/DISCRETE16, COMP18/DISCRETE18, COMP20/DISCRETE20, COMP22/DISCRETE22, COMP24/DISCRETE24, COMP26/DISCRETE26,	21-MAR-2014	31-MAR-2014	17-SEP-2014	✓	03-APR-2014	17-SEP-2014	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP071)</b> COMP1/DISCRETE1, COMP3/DISCRETE3, COMP5/DISCRETE5, COMP7/DISCRETE7, COMP9/DISCRETE9, COMP11/DISCRETE11, COMP13/DISCRETE13, COMP15/DISCRETE15, COMP17/DISCRETE17, COMP19/DISCRETE19,	COMP2/DISCRETE2, COMP4/DISCRETE4, COMP6/DISCRETE6, COMP8/DISCRETE8, COMP10/DISCRETE10, COMP12/DISCRETE12, COMP14/DISCRETE14, COMP16/DISCRETE16, COMP18/DISCRETE18, COMP20/DISCRETE20	21-MAR-2014	26-MAR-2014	04-APR-2014	✓	27-MAR-2014	05-MAY-2014	✓
<b>Soil Glass Jar - Unpreserved (EP071)</b> COMP21/DISCRETE21, COMP23/DISCRETE23, COMP25/DISCRETE25, COMP27/DISCRETE27	COMP22/DISCRETE22, COMP24/DISCRETE24, COMP26/DISCRETE26,	21-MAR-2014	26-MAR-2014	04-APR-2014	✓	28-MAR-2014	05-MAY-2014	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> COMP1/DISCRETE1, COMP3/DISCRETE3, COMP5/DISCRETE5, COMP7/DISCRETE7, COMP9/DISCRETE9, COMP11/DISCRETE11, COMP13/DISCRETE13, COMP15/DISCRETE15, COMP17/DISCRETE17, COMP19/DISCRETE19, COMP21/DISCRETE21, COMP23/DISCRETE23, COMP25/DISCRETE25, COMP27/DISCRETE27	COMP2/DISCRETE2, COMP4/DISCRETE4, COMP6/DISCRETE6, COMP8/DISCRETE8, COMP10/DISCRETE10, COMP12/DISCRETE12, COMP14/DISCRETE14, COMP16/DISCRETE16, COMP18/DISCRETE18, COMP20/DISCRETE20, COMP22/DISCRETE22, COMP24/DISCRETE24, COMP26/DISCRETE26,	21-MAR-2014	26-MAR-2014	04-APR-2014	✓	28-MAR-2014	05-MAY-2014	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

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> COMP21/DISCRETE21, COMP23/DISCRETE23, COMP25/DISCRETE25, COMP27/DISCRETE27	COMP22/DISCRETE22, COMP24/DISCRETE24, COMP26/DISCRETE26,	21-MAR-2014	26-MAR-2014	04-APR-2014	✓	29-MAR-2014	04-APR-2014	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> COMP1/DISCRETE1, COMP3/DISCRETE3, COMP5/DISCRETE5, COMP7/DISCRETE7, COMP9/DISCRETE9, COMP11/DISCRETE11, COMP13/DISCRETE13, COMP15/DISCRETE15, COMP17/DISCRETE17, COMP19/DISCRETE19,	COMP2/DISCRETE2, COMP4/DISCRETE4, COMP6/DISCRETE6, COMP8/DISCRETE8, COMP10/DISCRETE10, COMP12/DISCRETE12, COMP14/DISCRETE14, COMP16/DISCRETE16, COMP18/DISCRETE18, COMP20/DISCRETE20	21-MAR-2014	26-MAR-2014	04-APR-2014	✓	31-MAR-2014	04-APR-2014	✓



## Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Electrical Conductivity (1:5)	EA010	4	37	10.8	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Moisture Content	EA055-103	4	40	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	4	35	11.4	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
pH (1:5)	EA002	4	40	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS (Microwave Digestion)	EG035T-MW	3	27	11.1	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICPAES (Microwave Digestion)	EG005T-MW	2	27	7.4	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	4	40	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	4	40	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Electrical Conductivity (1:5)	EA010	2	37	5.4	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	35	5.7	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS (Microwave Digestion)	EG035T-MW	2	27	7.4	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICPAES (Microwave Digestion)	EG005T-MW	2	27	7.4	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	40	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	40	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
Electrical Conductivity (1:5)	EA010	2	37	5.4	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	35	5.7	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS (Microwave Digestion)	EG035T-MW	2	27	7.4	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICPAES (Microwave Digestion)	EG005T-MW	2	27	7.4	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	40	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	40	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	2	35	5.7	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS (Microwave Digestion)	EG035T-MW	2	27	7.4	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICPAES (Microwave Digestion)	EG005T-MW	2	27	7.4	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	40	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	40	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
pH (1:5)	EA002	SOIL	(APHA 21st ed., 4500H+) pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3) (Method 103)
Electrical Conductivity (1:5)	EA010	SOIL	(APHA 21st ed., 2510) Conductivity is determined on soil samples using a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3) (Method 104)
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Foreign Material Content	EA155	SOIL	Foreign Material Content (RTA T276)
Total Metals by ICPAES (Microwave Digestion)	EG005T-MW	SOIL	(USEPA SW846 - 3051 Microwave Digestion);(APHA 21st ed., 3120; USEPA SW846 - 6010) (ICPAES) Metals in solids are determined following a microwave digestion. The ICPAES technique ionizes selected elements. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass / charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS (Microwave Digestion)	EG035T-MW	SOIL	(USEPA SW846 - 3051 Microwave Digestion); AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following a microwave digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Microwave Digest for Metals in Soils, Sediments and Sludges	EN31	SOIL	USEPA SW 846 - 3051, Microwave Assisted Nitric Acid Digestion 1.0g of sample is mixed with 10 mL conc. Nitric acid in a closed, high pressure vessel, and heated using a specific program. Digest is appropriate for selected metals analysis in sludge, sediments, soils and oils. This method is compliant with NEPM (2013) Schedule B(3) (Method 203)
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of distilled water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.





## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.
- For all matrices, no Matrix Spike outliers occur.

#### Regular Sample Surrogates

Sub-Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Samples Submitted</b>							
EP075(SIM)T: PAH Surrogates	ES1406229-002	COMP2/DISCRETE2	2-Fluorobiphenyl	321-60-8	123 %	70-122 %	Recovery greater than upper data quality objective

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

Matrix: **SOIL**

Method	Extraction / Preparation			Analysis			
	Container / Client Sample ID(s)	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
<b>EA002 : pH (Soils)</b>							
<b>Soil Glass Jar - Unpreserved</b>							
COMP1/DISCRETE1, COMP3/DISCRETE3, COMP5/DISCRETE5, COMP7/DISCRETE7, COMP9/DISCRETE9, COMP11/DISCRETE11, COMP13/DISCRETE13, COMP15/DISCRETE15, COMP17/DISCRETE17, COMP19/DISCRETE19, COMP21/DISCRETE21, COMP23/DISCRETE23, COMP25/DISCRETE25, COMP27/DISCRETE27	COMP2/DISCRETE2, COMP4/DISCRETE4, COMP6/DISCRETE6, COMP8/DISCRETE8, COMP10/DISCRETE10, COMP12/DISCRETE12, COMP14/DISCRETE14, COMP16/DISCRETE16, COMP18/DISCRETE18, COMP20/DISCRETE20, COMP22/DISCRETE22, COMP24/DISCRETE24, COMP26/DISCRETE26,	31-MAR-2014	28-MAR-2014	3	----	----	----
<b>EA010: Conductivity</b>							



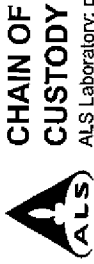
Matrix: **SOIL**

Method Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
<b>EA010: Conductivity - Analysis Holding Time Compliance</b>						
<b>Soil Glass Jar - Unpreserved</b>						
COMP1/DISCRETE1, COMP3/DISCRETE3, COMP5/DISCRETE5, COMP7/DISCRETE7, COMP9/DISCRETE9, COMP11/DISCRETE11, COMP13/DISCRETE13, COMP15/DISCRETE15, COMP17/DISCRETE17, COMP19/DISCRETE19, COMP21/DISCRETE21, COMP23/DISCRETE23, COMP25/DISCRETE25, COMP27/DISCRETE27	COMP2/DISCRETE2, COMP4/DISCRETE4, COMP6/DISCRETE6, COMP8/DISCRETE8, COMP10/DISCRETE10, COMP12/DISCRETE12, COMP14/DISCRETE14, COMP16/DISCRETE16, COMP18/DISCRETE18, COMP20/DISCRETE20, COMP22/DISCRETE22, COMP24/DISCRETE24, COMP26/DISCRETE26,	31-MAR-2014	28-MAR-2014	3	----	----

**Outliers : Frequency of Quality Control Samples**

The following report highlights breaches in the Frequency of Quality Control Samples.

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



**CHAIN OF CUSTODY**  
ALS Laboratory: please tick →

**CLIENT:** ENVIRON  
**OFFICE:** THE JUNGLE  
**PROJECT:** AS130328  
**PURCHASE ORDER NUMBER:**

**TURNAROUND REQUIREMENTS:**  
Standard TAT may be longer for some tests e.g. Ultra Trace Organics

**AL S QUOTE NO.:** SY981113  
**CONTACT PH:** 49625444

**PROJECT MANAGER:** FIONA ROBINSON  
**SAMPLER:** S. CADMAN  
**SAMPLER MOBILE:**

**COC emailed to ALS? ( YES / NO )** EDD FORMAT (or default):  
**Email Reports to (will default to PM if no other addresses are listed):**

**Email Invoice to (will default to PM if no other addresses are listed):**

**COMMENTS/ SPECIAL HANDLING/STORAGE OR DISPOSAL:**

**FOR LABORATORY USE ONLY (Circle)**  
Custody Seal Intact?  Yes  No  
Free ice / frozen ice bricks present upon receipt?  Yes  No  
Random Sample Temperature on Receipt: °C  
Other comment: 3-8C

**RECEIVED BY:** K.G.  
**DATE/TIME:** 21-3-14 17:20

**RELINQUISHED BY:** K.G.  
**DATE/TIME:** 24-3-14 17:00

**RECEIVED BY:** SW  
**DATE/TIME:** 24/3/14 19:00

ALS USE	SAMPLE DETAILS MATRIX - SOLID (S), WATER (W)	DATE/ TIME	MATRIX	CONTAINER INFORMATION TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).	Additional Information
1	COMP1 DISCRETE1	21/3/14	S	Bags & Jars	3	ASBESTOS	
2	COMP2 DISCRETE2				3	ASBESTOS	
3	COMP3 DISCRETE3				3	ASBESTOS	
4	COMP4 DISCRETE4				3	ASBESTOS	
5	COMP5 DISCRETE5				3	ASBESTOS	
6	COMP6 DISCRETE6				3	ASBESTOS	
7	COMP7 DISCRETE7				3	ASBESTOS	
8	COMP8 DISCRETE8				3	ASBESTOS	
9	COMP9 DISCRETE9				3	ASBESTOS	
10	COMP10 DISCRETE10				3	ASBESTOS	
11	COMP11 DISCRETE11				3	ASBESTOS	
12	COMP12 DISCRETE12				3	ASBESTOS	
<b>TOTAL</b>					36		

Environmental Division  
Sydney  
Work Order  
**ES1406229**

Telephone : + 61-2-8784 8555

**Water Container Codes:** P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Spock; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Solis; B = Unpreserved Bag.

**155081**

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**CHAIN OF CUSTODY**  
ALS Laboratory, please tick →

□ Sydney: 277 Woodpark Rd, Smithfield NSW 2164  
Ph: 02 8784 6555 E: samples.sydney@alsenviro.com

□ Brisbane: 32 Shand St, Stafford QLD 4053  
Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com

□ Perth: 10 Hot Way, Malaga, WA 6080  
Ph: 08 9209 7655 E: samples.perth@alsenviro.com

□ Newcastle: 5 Rosegum Rd, Warabrook NSW 2304  
Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com

□ Townsville: 14-15 Desma Ct, Bohle QLD 4818  
Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com

□ Adelaide: 21 Burma Rd, Pooraka SA 5095  
Ph: 08 8359 0890 E: adelaide@alsenviro.com

□ Launceston: 27 Wellington St, Launceston, TAS 7250  
Ph: 03 6331 2156 E: launceston@alsenviro.com

**FOR LABORATORY USE ONLY (Circle)**  
Custody Seal Intact?  Yes  No  
Free ice / frozen ice bricks present upon receipt?  Yes  No  
Random Sample Temperature on Receipt: °C  
Other comment: 308

**TURNAROUND REQUIREMENTS:**  
(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)  
 Standard TAT (List due date)  
 Non Standard or urgent TAT (List due date):

RECEIVED BY: *ke*  
DATE/TIME: 21-3-14 1720

RECEIVED BY: *ke*  
DATE/TIME: 24-3-14 1700

RECEIVED BY: *ke*  
DATE/TIME: 24-3-14 1900

RECEIVED BY: *ke*  
DATE/TIME: 24-3-14 1700

RECEIVED BY: *ke*  
DATE/TIME: 21-3-14 1720

RECEIVED BY: *ke*  
DATE/TIME: 21-3-14

COMMENTS/ SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX - SOLID (S), WATER (W)	DATE/ TIME	MATRIX	CONTAINER INFORMATION TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	ANALYSIS REQUIRED INCLUDING SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).	Additional Information
13	COMP13 DISCRETE	21/3/14	S	Bags & Jars	2	ASBESTOS	
14	COMP14 DISCRETE	14			3	ASBESTOS	
15	COMP15 DISCRETE				3	ASBESTOS	
16	COMP16 DISCRETE				3	ASBESTOS	
17	COMP17 DISCRETE				3	ASBESTOS	
18	COMP18 DISCRETE				3	ASBESTOS	
19	COMP19 DISCRETE				3	ASBESTOS	
20	COMP20 DISCRETE				3	ASBESTOS	
21	COMP21 DISCRETE				3	ASBESTOS	
22	COMP22 DISCRETE				3	ASBESTOS	
23	COMP23 DISCRETE				3	ASBESTOS	
24	COMP24 DISCRETE				3	ASBESTOS	
<b>TOTAL</b>							

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; A = Amber Glass Preserved; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Air/Inert Unpreserved Vial 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 Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

2/3

**155082**



**CHAIN OF CUSTODY**  
ALS Laboratory: please tick →

Sydney: 277 Woodpark Rd, Smithfield NSW 2164  
 Ph: 02 8764 8555 E: samples.sydney@alsenviro.com  
 Newcastle: 5 Rosegum Rd, Warabrook NSW 2304  
 Ph: 02 4988 8433 E: samples.newcastle@alsenviro.com  
 Brisbane: 32 Shand St, Stafford QLD 4053  
 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com  
 Melbourne: 24 Westall Rd, Springvale, VIC 3171  
 Ph: 03 8540 9900 E: samples.melbourne@alsenviro.com  
 Perth: 10 Hord Way, Malaga, WA 6080  
 Ph: 08 9209 7655 E: samples.perth@alsenviro.com  
 Townsville: 14-15 Desma Ct, Bohle QLD 4818  
 Ph: 07 4798 0600 E: townsville.environmental@alsenviro.com  
 Adelaide: 21 Burma Rd, Pooraka SA 5095  
 Ph: 08 8359 0890 E: adelaide@alsenviro.com  
 Launceston: 27 Wellington St, Launceston, TAS 7250  
 Ph: 03 8331 2150 E: launceston@alsenviro.com

**CLIENT:** ENVIRON  
**OFFICE:** THE JUNCTION  
**PROJECT:** AS130328  
**PURCHASE ORDER NUMBER:**  
**TURNAROUND REQUIREMENTS:**  
 Standard TAT (List due date):  
 Non Standard or urgent TAT (List due date):  
**ALS QUOTE NO.:** SY18113  
**PROJECT MANAGER:** FIONA ROBINSON **CONTACT PH:** 49625449  
**SAMPLER:** S. GADMAN **SAMPLER MOBILE:**  
**COC emailed to ALS? ( YES / NO )** **EDD FORMAT (or default):**  
**Email Reports to (will default to PM if no other addresses are listed):**  
**Email Invoice to (will default to PM if no other addresses are listed):**

**COMMENTS/ SPECIAL HANDLING/STORAGE OR DISPOSAL:**  
 RECEIVED BY: *ke* DATE/TIME: *21-3-14 1720*  
 RELINQUISHED BY: *ke* DATE/TIME: *24-3-14 1700*  
 RECEIVED BY: *Sergiy A-S* DATE/TIME: *24/3/14 1900*  
 Other comment: *3.8*

ALS USE	SAMPLE DETAILS MATRIX - SOLID (\$), WATER (W)	CONTAINER INFORMATION	ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).	Additional Information				
LAB ID	SAMPLE ID	DATE/ TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	P18/1 Comp Discrete	ASBESTOS	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
25	COMP25 DISCRETS 21/3/14 S	Bugs + Jaws			2	X		
26	COMP26 DISCRETS 26				1	X		
27	COMP27 DISCRETS 27				1	X		
<b>TOTAL</b>								

**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 Plastic; Airflight Unpreserved Plastic; AV = Airflight Unpreserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulfate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airflight Unpreserved 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; S\* = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

**EXAMINED**

155083

3/3

**APPENDIX 11**  
**MATERIALS TRACKING INFORMATION**

Material Tracking Report



Date	Source Reference	Material Type	Material Comments	Net Weight (T)	Vehicle Registration	Weighbridge Date	Weighbridge Time	Docket ID	Destination	Destination Grid Reference	Comment
01-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		17.5	CG04PY	01-Mar-19	11:05	516/1	Waste Stockpile Area	H	5.00
01-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		22.0	DIMECH	01-Mar-19	11:10	517/1	Waste Stockpile Area	H	5.00
01-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		19.4	CG04PY	01-Mar-19	11:50	519/1	Waste Stockpile Area	H	5.00
01-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		35.6	DIMECH	01-Mar-19	12:05	520/1	Waste Stockpile Area	H	5.00
01-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		25.1	CG04PY	01-Mar-19	12:30	522/1	Waste Stockpile Area	H	5.00
01-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		29.0	DIMECH	01-Mar-19	13:50	524/1	Waste Stockpile Area	H	5.00
01-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		19.1	CG04PY	01-Mar-19	14:00	525/1	Waste Stockpile Area	H	5.00
01-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		32.4	DIMECH	01-Mar-19	14:45	527/1	Waste Stockpile Area	H	5.00
01-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		24.9	CG04PY	01-Mar-19	14:55	528/2	Waste Stockpile Area	H	5.00
04-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		22.5	CG04PY	04-Mar-19	8:44	530/1	Waste Stockpile Area	H	5.00
04-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		32.8	DIMECH	04-Mar-19	8:55	531/1	Waste Stockpile Area	H	5.00
04-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		24.3	CG04PY	04-Jan-19	9:30	533/1	Waste Stockpile Area	H	5.00
04-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		33.2	DIMECH	04-Jan-19	9:40	534/1	Waste Stockpile Area	H	5.00
04-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		21.8	CG04PY	04-Jan-19	10:06	536/1	Waste Stockpile Area	H	5.00
04-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		23.9	CG04PY	04-Jan-19	10:46	537/1	Waste Stockpile Area	H	5.00
04-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		30.2	DIMECH	04-Jan-19	10:36	538/1	Waste Stockpile Area	H	5.00
04-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		27.7	DIMECH	04-Jan-19	11:37	539/1	Waste Stockpile Area	H	5.00
04-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		20.6	CQ03HO	04-Jan-19	11:05	541/1	Waste Stockpile Area	H	5.00
04-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		22.4	CQ03HO	04-Jan-19	11:43	542/1	Waste Stockpile Area	H	5.00
04-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		23.3	CG04PY	04-Jan-19	11:58	543/1	Waste Stockpile Area	H	5.00
04-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		23.5	CG04PY	04-Jan-19	12:28	544/1	Waste Stockpile Area	H	5.00
04-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		29.8	DIMECH	04-Jan-19	12:15	545/1	Waste Stockpile Area	H	5.00
04-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		31.3	DIMECH	04-Jan-19	13:16	546/1	Waste Stockpile Area	H	5.00
04-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		18.4	CQ03HO	04-Jan-19	12:21	547/1	Waste Stockpile Area	H	5.00
04-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		23.6	CG04PY	04-Jan-19	14:20	548/1	Waste Stockpile Area	H	5.00
04-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		24.1	CQ03HO	04-Jan-19	13:25	549/1	Waste Stockpile Area	H	5.00
04-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		29.9	DIMECH	04-Jan-19	14:29	550/1	Waste Stockpile Area	H	5.00
04-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		21.3	CG04PY	04-Jan-19	14:54	551/1	Waste Stockpile Area	H	5.00
04-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		32.5	DIMECH	04-Jan-19	15:06	552/1	Waste Stockpile Area	H	5.00
05-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		21.7	CG04PY	05-Mar-19	8:20	555/1	Waste Stockpile Area	F	3.00
05-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		25.2	CG04PY	05-Mar-19	8:54	556/1	Waste Stockpile Area	F	3.00
05-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		25.3	CG04PY	05-Mar-19	9:30	557/1	Waste Stockpile Area	F	3.00
05-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		24.6	CG04PY	05-Mar-19	10:09	558/1	Waste Stockpile Area	F	3.00
05-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		29.5	DIMECH	05-Mar-19	9:50	559/1	Waste Stockpile Area	F	3.00
05-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		32.4	DIMECH	05-Mar-19	10:25	560/1	Waste Stockpile Area	F	3.00
05-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		10.8	CQ03HO	05-Mar-19	10:15	561/1	Waste Stockpile Area	F	3.00
05-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		9.5	CQ03HO	05-Mar-19	9:39	562/1	Waste Stockpile Area	F	3.00
05-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		12.0	CQ03HO	05-Mar-19	9:13	563/1	Waste Stockpile Area	F	3.00
05-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		10.5	CQ03HO	05-Mar-19	8:37	564/1	Waste Stockpile Area	F	3.00
05-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		10.4	CQ03HO	05-Mar-19	8:13	565/1	Waste Stockpile Area	F	3.00
05-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		25.3	CG04PY	05-Mar-19	11:41	566/1	Waste Stockpile Area	F	3.00
05-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		11.6	CQ03HO	05-Mar-19	11:46	567/1	Waste Stockpile Area	F	3.00
05-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		32.6	DIMECH	05-Mar-19	12:00	568/1	Waste Stockpile Area	F	3.00
05-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		12.0	CQ03HO	05-Mar-19	12:16	569/1	Waste Stockpile Area	F	3.00
05-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		23.5	CG04PY	05-Mar-19	12:24	570/1	Waste Stockpile Area	F	3.00
05-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		22.9	CG04PY	05-Mar-19	13:13	571/1	Waste Stockpile Area	F	3.00
05-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		20.4	CG04PY	05-Mar-19	13:49	572/1	Waste Stockpile Area	F	3.00
05-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		21.9	CG04PY	05-Mar-19	14:45	573/1	Waste Stockpile Area	F	3.00
05-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		32.5	DIMECH	05-Mar-19	14:00	574/1	Waste Stockpile Area	F	3.00
05-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		27.4	DIMECH	05-Mar-19	13:25	575/1	Waste Stockpile Area	F	3.00
05-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		33.2	DIMECH	05-Mar-19	12:44	576/1	Waste Stockpile Area	F	3.00
05-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		28.2	DIMECH	05-Mar-19	14:57	577/1	Waste Stockpile Area	F	3.00
05-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		10.1	CQ03HO	05-Mar-19	12:45	580/1	Waste Stockpile Area	F	3.00
05-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		35.1	DIMECH	05-Mar-19	15:31	581/1	Waste Stockpile Area	F	3.00
05-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		23.1	CG04PY	05-Mar-19	15:18	582/1	Waste Stockpile Area	G	3.00
06-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		22.2	CG04PY	06-Mar-19	8:10	585/1	Waste Stockpile Area	G	3.00
06-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		29.0	DIMECH	06-Mar-19	8:30	586/1	Waste Stockpile Area	G	3.00
06-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		22.4	CG04PY	06-Mar-19	8:44	588/1	Waste Stockpile Area	G	3.00
06-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		28.8	DIMECH	06-Mar-19	9:05	589/1	Waste Stockpile Area	G	3.00
06-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		20.1	CG04PY	06-Mar-19	9:20	591/1	Waste Stockpile Area	G	3.00
06-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		31.7	DIMECH	06-Mar-19	9:42	592/1	Waste Stockpile Area	G	3.00
06-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		23.1	CG04PY	06-Mar-19	9:57	594/1	Waste Stockpile Area	G	3.00
06-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		25.4	CG04PY	06-Mar-19	11:16	595/1	Waste Stockpile Area	G	3.00
06-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		32.2	DIMECH	06-Mar-19	10:16	596/1	Waste Stockpile Area	G	3.00
06-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		33.0	DIMECH	06-Mar-19	11:24	599/1	Waste Stockpile Area	G	3.00
06-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		25.4	CG04PY	06-Mar-19	11:49	600/1	Waste Stockpile Area	G	3.00
06-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		34.9	DIMECH	06-Mar-19	12:00	601/1	Waste Stockpile Area	G	3.00
06-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		11.9	CQ03HO	06-Mar-19	12:05	602/1	Waste Stockpile Area	G	3.00
06-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		23.0	CG04PY	06-Mar-19	12:23	603/1	Waste Stockpile Area	G	3.00
06-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		31.8	DIMECH	06-Mar-19	12:36	604/1	Waste Stockpile Area	G	3.00
06-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		22.8	CG04PY	06-Mar-19	13:00	605/1	Waste Stockpile Area	G	3.00
06-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		31.0	DIMECH	06-Mar-19	13:11	606/1	Waste Stockpile Area	G	3.00
06-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		11.9	CQ03HO	06-Mar-19	12:40	607/1	Waste Stockpile Area	G	3.00
07-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		21.3	CG04PY	07-Mar-19	8:48	608/1	Waste Stockpile Area	H	3.00
07-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		31.5	DIMECH	07-Mar-19	8:56	609/1	Waste Stockpile Area	H	3.00
07-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		23.8	CG04PY	07-Mar-19	9:25	613/1	Waste Stockpile Area	H	3.00
07-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		29.2	DIMECH	07-Mar-19	9:37	614/1	Waste Stockpile Area	H	3.00
07-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		22.1	CG04PY	07-Mar-19	10:00	615/1	Waste Stockpile Area	H	3.00
07-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		24.9	CG04PY	07-Mar-19	10:41	616/1	Waste Stockpile Area	H	3.00
07-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		32.7	DIMECH	07-Mar-19	10:33	617/1	Waste Stockpile Area	H	3.00
07-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		9.1	CQ03HO	07-Mar-19	9:43	618/1	Waste Stockpile Area	H	3.00
07-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		31.0	DIMECH	07-Mar-19	11:39	621/1	Waste Stockpile Area	H	3.00
07-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		21.2	CG04PY	07-Mar-19	11:45	622/1	Waste Stockpile Area	H	3.00
07-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		22.3	CG04PY	07-Mar-19	13:00	624/1	Waste Stockpile Area	H	3.00
07-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		23.1	CG04PY	07-Mar-19	13:40	625/1	Waste Stockpile Area	H	3.00
07-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		30.4	DIMECH	07-Mar-19	12:58	626/1	Waste Stockpile Area	H	3.00
07-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		34.2	DIMECH	07-Mar-19	14:13	629/1	Waste Stockpile Area	H	3.00
07-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		32.8	DIMECH	07-Mar-19	13:34	630/1	Waste Stockpile Area	H	3.00
07-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		23.7	CG04PY	07-Mar-19	14:25	631/1	Waste Stockpile Area	H	3.00
07-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		25.3	CG04PY	07-Mar-19	15:18	633/1	Waste Stockpile Area	H	3.00
07-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		32.8	DIMECH	07-Mar-19	15:10	635/1	Waste Stockpile Area	H	3.00
07-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		35.7	DIMECH	07-Mar-19	15:46	637/1	Waste Stockpile Area	H	3.00
07-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		24.6	CG04PY	07-Mar-19	15:54	638/1	Waste Stockpile Area	H	3.00
08-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		24.7	CG04PY	08-Mar-19	8:43	643/1	Waste Stockpile Area	H	3.00
08-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		24.0	DIMECH	08-Mar-19	8:53	644/1	Waste Stockpile Area	H	3.00
08-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		26.9	CG04PY	08-Mar-19	9:19	645/1	Waste Stockpile Area	H	3.00
08-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		26.9	CG04PY	08-Mar-19	9:57	646/1	Waste Stockpile Area	H	3.00
08-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		28.7	CG04PY	08-Mar-19	10:36	647/1	Waste Stockpile Area	H	3.00
08-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		27.5	DIMECH	08-Mar-19	9:31	648/1	Waste Stockpile Area	H	3.00
08-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		28.1	DIMECH	08-Mar-19	10:10	649/1	Waste Stockpile Area	H	3.00
08-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		27.6	DIMECH	08-Mar-19	10:46	650/1	Waste Stockpile Area	H	3.00
08-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		28.3	DIMECH	08-Mar-19	11:50	654/1	Waste Stockpile Area	H	3.00
08-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		27.9	CG04PY	08-Mar-19	11:42	655/1	Waste Stockpile Area	H	3.00
08-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		23.5	CG04PY	08-Mar-19	12:44	657/1	Waste Stockpile Area	H	3.00
08-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		25.5	CG04PY	08-Mar-19	13:22	658/1	Waste Stockpile Area	H	3.00
08-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		27.1	CG04PY	08-Mar-19	13:57	659/1	Waste Stockpile Area	H	3.00
08-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		25.8	CG04PY	08-Mar-19	15:00	660/1	Waste Stockpile Area	H	3.00
08-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		24.9	DIMECH	08-Mar-19	12:53	661/1	Waste Stockpile Area	H	3.00

Material Tracking Report



Date	Source Reference	Material Type	Material Comments	Net Weight (T)	Vehicle Registration	Weighbridge Date	Weighbridge Time	Docket ID	Destination	Destination Grid Reference	Comment
08-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		25.4	DIMECH	08-Mar-19	13:38	662/1	Waste Stockpile Area	H	3.00
08-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		29.2	DIMECH	08-Mar-19	14:55	663/1	Waste Stockpile Area	H	3.00
11-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		26.7	CG04PY	11-Mar-19	8:20	673/1	Waste Stockpile Area	C	3.00
11-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		26.9	CG04PY	11-Mar-19	8:52	674/1	Waste Stockpile Area	C	3.00
11-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		27.3	DIMECH	11-Mar-19	8:22	675/1	Waste Stockpile Area	C	3.00
11-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		25.8	DIMECH	11-Mar-19	9:11	677/1	Waste Stockpile Area	C	3.00
11-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		26.9	CG04PY	11-Mar-19	9:27	680/1	Waste Stockpile Area	C	3.00
11-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		28.9	CG04PY	11-Mar-19	10:04	683/1	Waste Stockpile Area	C	3.00
11-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		29.7	DIMECH	11-Mar-19	9:50	684/1	Waste Stockpile Area	C	3.00
11-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		29.5	DIMECH	11-Mar-19	10:30	685/1	Waste Stockpile Area	C	3.00
11-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		27.6	CG04PY	11-Mar-19	11:21	688/1	Waste Stockpile Area	C	3.00
11-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		29.7	CG04PY	11-Mar-19	11:58	689/1	Waste Stockpile Area	C	3.00
11-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		28.6	DIMECH	11-Mar-19	11:41	690/1	Waste Stockpile Area	C	3.00
11-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		28.8	DIMECH	11-Mar-19	12:17	691/1	Waste Stockpile Area	C	3.00
11-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		27.9	CG04PY	11-Mar-19	12:35	692/1	Waste Stockpile Area	C	3.00
11-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		29.4	CG04PY	11-Mar-19	13:09	696/1	Waste Stockpile Area	C	3.00
11-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		28.1	CG04PY	11-Mar-19	13:47	697/1	Waste Stockpile Area	C	3.00
11-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		28.0	DIMECH	11-Mar-19	12:52	698/1	Waste Stockpile Area	C	3.00
11-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		29.4	DIMECH	11-Mar-19	13:29	699/1	Waste Stockpile Area	C	3.00
11-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		27.8	DIMECH	11-Mar-19	14:17	702/1	Waste Stockpile Area	C	3.00
11-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		29.0	CG04PY	11-Mar-19	14:31	703/1	Waste Stockpile Area	C	3.00
11-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		29.3	CG04PY	11-Mar-19	15:07	704/1	Waste Stockpile Area	C	3.00
11-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		28.7	DIMECH	11-Mar-19	14:55	705/1	Waste Stockpile Area	C	3.00
11-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		29.9	DIMECH	11-Mar-19	15:32	708/1	Waste Stockpile Area	C	3.00
11-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		30.3	CG04PY	11-Mar-19	15:43	709/1	Waste Stockpile Area	C	3.00
12-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		28.8	CG04PY	12-Mar-19	7:56	714/1	Waste Stockpile Area	C	4.00
12-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		29.5	DIMECH	12-Mar-19	8:07	715/1	Waste Stockpile Area	C	4.00
12-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		27.2	CG04PY	12-Mar-19	8:31	716/1	Waste Stockpile Area	C	4.00
12-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		29.1	DIMECH	12-Mar-19	8:42	718/1	Waste Stockpile Area	C	4.00
12-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		27.2	CG04PY	12-Mar-19	9:06	719/1	Waste Stockpile Area	C	4.00
12-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		28.1	DIMECH	12-Mar-19	9:23	721/1	Waste Stockpile Area	C	4.00
12-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		28.5	CG04PY	12-Mar-19	10:14	722/1	Waste Stockpile Area	C	4.00
12-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		28.2	DIMECH	12-Mar-19	10:27	723/1	Waste Stockpile Area	C	4.00
12-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		27.7	CG04PY	12-Mar-19	11:27	726/1	Waste Stockpile Area	C	4.00
12-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		28.5	DIMECH	12-Mar-19	11:48	727/1	Waste Stockpile Area	C	4.00
12-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		26.0	CG04PY	12-Mar-19	12:05	728/1	Waste Stockpile Area	C	4.00
12-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		31.2	DIMECH	12-Mar-19	12:28	729/1	Waste Stockpile Area	C	4.00
12-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		26.6	CG04PY	12-Mar-19	12:42	730/1	Waste Stockpile Area	C	4.00
12-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		29.1	DIMECH	12-Mar-19	13:03	733/1	Waste Stockpile Area	C	4.00
12-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		26.8	CG04PY	12-Mar-19	13:20	735/1	Waste Stockpile Area	C	4.00
12-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		26.6	CG04PY	12-Mar-19	13:54	737/1	Waste Stockpile Area	C	4.00
12-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		27.5	DIMECH	12-Mar-19	13:39	738/1	Waste Stockpile Area	C	4.00
12-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		25.5	DIMECH	12-Mar-19	14:20	739/1	Waste Stockpile Area	C	4.00
12-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		25.1	CG04PY	12-Mar-19	14:33	740/1	Waste Stockpile Area	C	4.00
12-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		26.8	DIMECH	12-Mar-19	14:58	741/1	Waste Stockpile Area	C	4.00
12-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		24.6	CG04PY	12-Mar-19	15:14	742/1	Waste Stockpile Area	C	4.00
12-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		30.0	DIMECH	12-Mar-19	15:36	743/1	Waste Stockpile Area	C	4.00
12-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		29.1	CG04PY	12-Mar-19	15:46	744/1	Waste Stockpile Area	C	4.00
13-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		11.6	CQ03HO	13-Mar-19	7:28	745/2	Waste Stockpile Area	C	5.00
13-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		26.5	CG04PY	13-Mar-19	8:10	748/1	Waste Stockpile Area	C	5.00
13-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		25.4	DIMECH	13-Mar-19	8:20	749/1	Waste Stockpile Area	C	5.00
13-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		26.5	CG04PY	13-Mar-19	9:18	753/1	Waste Stockpile Area	C	5.00
13-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		26.6	DIMECH	13-Mar-19	9:22	754/1	Waste Stockpile Area	C	5.00
13-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		27.9	CG04PY	13-Mar-19	9:58	757/1	Waste Stockpile Area	C	5.00
13-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		28.2	DIMECH	13-Mar-19	10:10	759/1	Waste Stockpile Area	C	5.00
13-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		23.8	CG04PY	13-Mar-19	11:15	761/1	Waste Stockpile Area	C	5.00
13-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		26.6	DIMECH	13-Mar-19	11:20	762/1	Waste Stockpile Area	C	5.00
13-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		26.8	CG04PY	13-Mar-19	11:52	764/1	Waste Stockpile Area	C	5.00
13-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		24.2	DIMECH	13-Mar-19	12:03	765/1	Waste Stockpile Area	C	5.00
13-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		28.1	CG04PY	13-Mar-19	12:30	767/1	Waste Stockpile Area	C	5.00
13-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		26.4	DIMECH	13-Mar-19	12:44	768/1	Waste Stockpile Area	C	5.00
13-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		26.5	CG04PY	13-Mar-19	13:06	770/1	Waste Stockpile Area	C	5.00
13-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		30.2	DIMECH	13-Mar-19	13:22	771/1	Waste Stockpile Area	C	5.00
13-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		29.6	CG04PY	13-Mar-19	13:45	772/1	Waste Stockpile Area	C	5.00
13-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		28.0	DIMECH	13-Mar-19	14:07	773/1	Waste Stockpile Area	C	5.00
13-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		27.1	CG04PY	13-Mar-19	14:25	775/1	Waste Stockpile Area	C	5.00
13-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		27.8	DIMECH	13-Mar-19	14:49	776/1	Waste Stockpile Area	C	5.00
13-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		10.3	CQ03HO	13-Mar-19	14:54	777/1	Waste Stockpile Area	C	5.00
13-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		27.0	CG04PY	13-Mar-19	15:06	778/1	Waste Stockpile Area	C	5.00
13-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		28.9	DIMECH	13-Mar-19	15:27	779/1	Waste Stockpile Area	C	5.00
13-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		11.6	CQ03HO	13-Mar-19	15:32	780/1	Waste Stockpile Area	C	5.00
13-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		24.6	CG04PY	13-Mar-19	15:45	781/1	Waste Stockpile Area	C	5.00
14-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		25.6	CG04PY	14-Mar-19	8:17	784/1	Waste Stockpile Area	C	6.00
14-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		26.2	CG04PY	14-Mar-19	8:58	785/1	Waste Stockpile Area	C	6.00
14-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		26.4	CG04PY	14-Mar-19	9:37	786/1	Waste Stockpile Area	C	6.00
14-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		26.5	DIMECH	14-Mar-19	8:27	787/1	Waste Stockpile Area	C	6.00
14-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		30.2	DIMECH	14-Mar-19	9:09	788/1	Waste Stockpile Area	C	6.00
14-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		27.7	CG04PY	14-Mar-19	10:17	790/1	Waste Stockpile Area	C	6.00
14-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		27.5	DIMECH	14-Mar-19	9:50	791/1	Waste Stockpile Area	C	6.00
14-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		25.3	DIMECH	14-Mar-19	10:28	792/1	Waste Stockpile Area	C	6.00
14-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		28.7	CG04PY	14-Mar-19	11:25	794/1	Waste Stockpile Area	C	6.00
14-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		29.3	CG04PY	14-Mar-19	12:04	795/1	Waste Stockpile Area	C	6.00
14-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		27.5	CG04PY	14-Mar-19	12:42	796/1	Waste Stockpile Area	C	6.00
14-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		26.7	DIMECH	14-Mar-19	11:37	797/1	Waste Stockpile Area	C	6.00
14-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		26.1	DIMECH	14-Mar-19	12:17	798/1	Waste Stockpile Area	C	6.00
14-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		25.9	DIMECH	14-Mar-19	12:55	799/1	Waste Stockpile Area	C	6.00
14-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		25.6	CG04PY	14-Mar-19	13:22	803/1	Waste Stockpile Area	C	6.00
14-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		28.0	CG04PY	14-Mar-19	14:03	804/1	Waste Stockpile Area	C	6.00
14-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		28.1	DIMECH	14-Mar-19	13:34	805/1	Waste Stockpile Area	C	6.00
14-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		28.4	DIMECH	14-Mar-19	14:15	806/1	Waste Stockpile Area	C	6.00
14-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		29.0	CG04PY	14-Mar-19	14:40	809/1	Waste Stockpile Area	C	6.00
14-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		29.1	DIMECH	14-Mar-19	14:54	810/1	Waste Stockpile Area	C	6.00
14-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		11.7	CQ03HO	14-Mar-19	15:00	811/1	Waste Stockpile Area	C	6.00
14-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		29.3	CG04PY	14-Mar-19	15:23	812/1	Waste Stockpile Area	C	6.00
14-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		27.7	DIMECH	14-Mar-19	15:34	813/1	Waste Stockpile Area	C	6.00
14-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		11.4	CQ03HO	14-Mar-19	15:36	814/1	Waste Stockpile Area	C	6.00
15-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		26.6	CG04PY	15-Mar-19	7:54	815/1	Waste Stockpile Area	E	6.00
15-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		27.3	DIMECH	15-Mar-19	7:56	816/1	Waste Stockpile Area	E	6.00
15-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		25.6	CG04PY	15-Mar-19	8:30	821/1	Waste Stockpile Area	E	6.00
15-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		27.8	DIMECH	15-Mar-19	8:52	822/1	Waste Stockpile Area	E	6.00
15-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		27.1	CG04PY	15-Mar-19	9:10	823/1	Waste Stockpile Area	E	6.00
15-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		28.2	DIMECH	15-Mar-19	9:33	824/1	Waste Stockpile Area	E	6.00
15-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		27.5	CG04PY	15-Mar-19	9:50	829/1	Waste Stockpile Area	E	6.00
15-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		26.3	CG04PY	15-Mar-19	10:27	830/1	Waste Stockpile Area	E	6.00
15-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		30.9	DIMECH	15-Mar-19	10:11	831/1	Waste Stockpile Area	E	6.00
15-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		32.6	DIMECH	15-Mar-19	11:24	832/1	Waste Stockpile Area	E	6.00
15-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		29.2	CG04PY	15-Mar-19	11:49	838/1	Waste Stockpile Area	E	6.00
15-Mar-19	MUNICIPAL LANDFILL	Municipal Waste		27.1	CG04PY	15-Mar-19	12:21	839/1	Waste Stockpile Area	E	6.00











Date	Source Reference	Material Type	Material Comments	Net Weight (T)	Vehicle Registration	Weighbridge Date	Weighbridge Time	Docket ID	Destination	Destination Grid Reference	Comment
08-Apr-19	MUNICIPAL LANDFILL	Municipal Waste		30.5	DIMECH	08-Apr-19	10:38		Waste Stockpile Area	K	8.00
08-Apr-19	MUNICIPAL LANDFILL	Municipal Waste		32.9	DIMECH	08-Apr-19	11:22		Waste Stockpile Area	K	8.00
08-Apr-19	MUNICIPAL LANDFILL	Municipal Waste		28.6	DIMECH	08-Apr-19	12:20		Waste Stockpile Area	K	8.00
08-Apr-19	MUNICIPAL LANDFILL	Municipal Waste		30.6	DIMECH	08-Apr-19	13:37		Waste Stockpile Area	K	8.00
08-Apr-19	MUNICIPAL LANDFILL	Municipal Waste		31.0	DIMECH	08-Apr-19	15:38		Waste Stockpile Area	K	8.00
08-Apr-19	MUNICIPAL LANDFILL	Municipal Waste		20.5	CQ03HO	08-Apr-19	8:15		Waste Stockpile Area	K	8.00
08-Apr-19	MUNICIPAL LANDFILL	Municipal Waste		22.6	CQ03HO	08-Apr-19	8:09		Waste Stockpile Area	K	7.00
08-Apr-19	MUNICIPAL LANDFILL	Municipal Waste		25.8	CQ03HO	08-Apr-19	9:01		Waste Stockpile Area	K	7.00
08-Apr-19	MUNICIPAL LANDFILL	Municipal Waste		24.1	CQ03HO	08-Apr-19	10:52		Waste Stockpile Area	K	7.00
08-Apr-19	MUNICIPAL LANDFILL	Municipal Waste		26.7	CQ03HO	08-Apr-19	11:45		Waste Stockpile Area	K	7.00
08-Apr-19	MUNICIPAL LANDFILL	Municipal Waste		24.5	CQ03HO	08-Apr-19	12:54		Waste Stockpile Area	K	7.00
08-Apr-19	MUNICIPAL LANDFILL	Municipal Waste		21.3	CQ03HO	08-Apr-19	15:47		Waste Stockpile Area	K	7.00
09-Apr-19	MUNICIPAL LANDFILL	Municipal Waste		25.2	CG04PY	09-Apr-19	7:50		Waste Stockpile Area	K	6.00
09-Apr-19	MUNICIPAL LANDFILL	Municipal Waste		30.2	CG04PY	09-Apr-19	8:35		Waste Stockpile Area	K	6.00
09-Apr-19	MUNICIPAL LANDFILL	Municipal Waste		25.4	DIMECH	09-Apr-19	6:55		Waste Stockpile Area	K	6.00
09-Apr-19	MUNICIPAL LANDFILL	Municipal Waste		32.7	DIMECH	09-Apr-19	9:20		Waste Stockpile Area	K	6.00
10-Apr-19	MUNICIPAL LANDFILL	Municipal Waste		29.3	DIMECH	10-Apr-19	10:14		Waste Stockpile Area	J	8.00
10-Apr-19	MUNICIPAL LANDFILL	Municipal Waste		28.5	DIMECH	10-Apr-19	10:53		Waste Stockpile Area	J	8.00
10-Apr-19	MUNICIPAL LANDFILL	Municipal Waste		31.5	DIMECH	10-Apr-19	11:37		Waste Stockpile Area	J	8.00
10-Apr-19	MUNICIPAL LANDFILL	Municipal Waste		32.0	DIMECH	10-Apr-19	12:21		Waste Stockpile Area	J	8.00
10-Apr-19	MUNICIPAL LANDFILL	Municipal Waste		31.4	DIMECH	10-Apr-19	13:00		Waste Stockpile Area	J	8.00
10-Apr-19	MUNICIPAL LANDFILL	Municipal Waste		33.0	DIMECH	10-Apr-19	13:50		Waste Stockpile Area	J	8.00

Material Tracking Report



Date	Source Reference	Material Type	Material Comments	Net Weight (T)	Vehicle Registration	Weighbridge Date	Weighbridge Time	Docket ID	Destination	Destination Grid Reference	Comment
13-May-19	M15 ENM soil	Soil		24.95	CG04PY	13-May-19	15:05		Municipal Landfill _ Backfill		
13-May-19	M15 ENM soil	Soil		28.17	CG04PY	13-May-19	15:46		Municipal Landfill _ Backfill		
13-May-19	M15 ENM soil	Soil		8.62	CO03HO	13-May-19	14:55		Municipal Landfill _ Backfill		
13-May-19	M15 ENM soil	Soil		11.06	CO03HO	13-May-19	15:32		Municipal Landfill _ Backfill		
13-May-19	M15 ENM soil	Soil		28.56	DIMECH	13-May-19	15:33		Municipal Landfill _ Backfill		
13-May-19	M15 ENM soil	Soil		29.42	DIMECH	13-May-19	15:00		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		31.56	CG04PY	14-May-19	7:45		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		29.2	CG04PY	14-May-19	8:17		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		31.02	CG04PY	14-May-19	8:52		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		28.4	CG04PY	14-May-19	9:25		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		30.26	CG04PY	14-May-19	9:56		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		26.72	CG04PY	14-May-19	10:25		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		29.94	CG04PY	14-May-19	11:05		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		29.54	CG04PY	14-May-19	11:38		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		30.76	CG04PY	14-May-19	12:10		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		29.26	CG04PY	14-May-19	12:44		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		32.24	CG04PY	14-May-19	13:22		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		31.4	CG04PY	14-May-19	14:00		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		31.38	CG04PY	14-May-19	14:34		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		32.42	DIMECH	14-May-19	14:47		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		29.3	DIMECH	14-May-19	14:13		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		28.06	DIMECH	14-May-19	13:35		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		31.12	DIMECH	14-May-19	13:00		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		30.24	DIMECH	14-May-19	12:32		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		28.24	DIMECH	14-May-19	11:43		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		29.18	DIMECH	14-May-19	11:18		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		29.4	DIMECH	14-May-19	10:40		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		27.64	DIMECH	14-May-19	10:10		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		29.42	DIMECH	14-May-19	9:37		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		28.84	DIMECH	14-May-19	9:05		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		27.91	DIMECH	14-May-19	8:30		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		32.78	DIMECH	14-May-19	7:54		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		11.06	CO03HO	14-May-19	7:35		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		11.4	CO03HO	14-May-19	8:08		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		8.04	CO03HO	14-May-19	8:34		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		10.78	CO03HO	14-May-19	9:15		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		9.26	CO03HO	14-May-19	9:42		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		8.32	CO03HO	14-May-19	10:10		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		9.28	CO03HO	14-May-19	10:40		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		8.9	CO03HO	14-May-19	11:23		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		9.14	CO03HO	14-May-19	11:54		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		9.98	CO03HO	14-May-19	12:33		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		8.58	CO03HO	14-May-19	13:30		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		9.28	CO03HO	14-May-19	14:00		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		10.78	CO03HO	14-May-19	14:35		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		30.64	CO03HO	14-May-19	15:09		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		31.62	CG04PY	14-May-19	15:44		Municipal Landfill _ Backfill		
14-May-19	M15 ENM soil	Soil		31.3	DIMECH	14-May-19	15:25		Municipal Landfill _ Backfill		
15-May-19	M15 ENM soil	Soil		32.42	CG04PY	15-May-19	10:51		Municipal Landfill _ Backfill		
15-May-19	M15 ENM soil	Soil		30.26	CG04PY	15-May-19	11:29		Municipal Landfill _ Backfill		
15-May-19	M15 ENM soil	Soil		29.54	CG04PY	15-May-19	12:00		Municipal Landfill _ Backfill		
15-May-19	M15 ENM soil	Soil		30.4	CG04PY	15-May-19	12:33		Municipal Landfill _ Backfill		
15-May-19	M15 ENM soil	Soil		28.52	CG04PY	15-May-19	13:12		Municipal Landfill _ Backfill		
15-May-19	M15 ENM soil	Soil		31.18	CG04PY	15-May-19	13:45		Municipal Landfill _ Backfill		
15-May-19	M15 ENM soil	Soil		32.82	CG04PY	15-May-19	14:20		Municipal Landfill _ Backfill		
15-May-19	M15 ENM soil	Soil		30.72	CG04PY	15-May-19	14:51		Municipal Landfill _ Backfill		
15-May-19	M15 ENM soil	Soil		31.42	CG04PY	15-May-19	15:23		Municipal Landfill _ Backfill		
15-May-19	M15 ENM soil	Soil		32.72	DIMECH	15-May-19	13:15		Municipal Landfill _ Backfill		
15-May-19	M15 ENM soil	Soil		31.92	DIMECH	15-May-19	14:40		Municipal Landfill _ Backfill		
15-May-19	M15 ENM soil	Soil		31.24	DIMECH	15-May-19	14:08		Municipal Landfill _ Backfill		
15-May-19	M15 ENM soil	Soil		29.68	DIMECH	15-May-19	13:30		Municipal Landfill _ Backfill		
15-May-19	M15 ENM soil	Soil		35.3	DIMECH	15-May-19	12:58		Municipal Landfill _ Backfill		
15-May-19	M15 ENM soil	Soil		28.44	DIMECH	15-May-19	12:20		Municipal Landfill _ Backfill		
15-May-19	M15 ENM soil	Soil		30.22	DIMECH	15-May-19	11:43		Municipal Landfill _ Backfill		
15-May-19	M15 ENM soil	Soil		31.26	DIMECH	15-May-19	11:09		Municipal Landfill _ Backfill		
15-May-19	M15 ENM soil	Soil		34.42	DIMECH	15-May-19	10:33		Municipal Landfill _ Backfill		
15-May-19	M15 ENM soil	Soil		9.32	CO03HO	15-May-19	0:00		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		29.8	CG04PY	16-May-19	7:16		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		30.96	CG04PY	16-May-19	7:55		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		30.48	CG04PY	16-May-19	8:27		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		34.38	CG04PY	16-May-19	9:10		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		33.44	CG04PY	16-May-19	9:44		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		32.76	CG04PY	16-May-19	10:17		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		32.48	CG04PY	16-May-19	10:48		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		31.48	CG04PY	16-May-19	11:22		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		31.64	CG04PY	16-May-19	11:54		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		31.28	DIMECH	16-May-19	7:25		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		32.18	DIMECH	16-May-19	8:02		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		30.38	DIMECH	16-May-19	8:40		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		32.52	DIMECH	16-May-19	9:17		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		29.6	DIMECH	16-May-19	9:54		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		29.88	DIMECH	16-May-19	10:28		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		30.36	DIMECH	16-May-19	11:13		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		30.82	DIMECH	16-May-19	11:47		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		32.22	CG04PY	16-May-19	12:34		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		31.32	CG04PY	16-May-19	13:03		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		32.04	CG04PY	16-May-19	13:48		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		31.08	CG04PY	16-May-19	14:28		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		30	CG04PY	16-May-19	15:03		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		31.74	CG04PY	16-May-19	15:37		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		30.78	DIMECH	16-May-19	11:20		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		32.12	DIMECH	16-May-19	13:07		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		28.78	DIMECH	16-May-19	13:44		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		31.06	DIMECH	16-May-19	14:18		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		32.82	DIMECH	16-May-19	14:52		Municipal Landfill _ Backfill		
16-May-19	M15 ENM soil	Soil		33.56	DIMECH	16-May-19	15:25		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e	30.65	CG04PY	17-May-19	8:15		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e	30.65	CG04PY	17-May-19	9:07		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e	31.35	CG04PY	17-May-19	9:40		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e	30.75	CG04PY	17-May-19	10:12		Municipal Landfill _ Backfill		

Material Tracking Report



Date	Source Reference	Material Type	Material Comments	Net Weight (T)	Vehicle Registration	Weighbridge Date	Weighbridge Time	Docket ID	Destination	Destination Grid Reference	Comment
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	31.95	CG04PY	17-May-19	10:51		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	30.85	CG04PY	17-May-19	11:22		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	30.35	CG04PY	17-May-19	11:52		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	30.05	CG04PY	17-May-19	12:26		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	30.95	CG04PY	17-May-19	13:00		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	30.35	CG04PY	17-May-19	13:36		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	31.45	CG04PY	17-May-19	14:16		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	30.95	CG04PY	17-May-19	14:58		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	31.82	DIMECH	17-May-19	15:24		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	30.4	DIMECH	17-May-19	14:39		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	30.9	DIMECH	17-May-19	14:04		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	29.8	DIMECH	17-May-19	13:24		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	30.4	DIMECH	17-May-19	12:51		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	29.5	DIMECH	17-May-19	12:21		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	29.8	DIMECH	17-May-19	11:40		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	30.3	DIMECH	17-May-19	11:01		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	31.4	DIMECH	17-May-19	10:27		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	30.2	DIMECH	17-May-19	9:48		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	30.8	DIMECH	17-May-19	9:14		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	31.6	DIMECH	17-May-19	8:20		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	11.44	CO03HO	17-May-19	8:17		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	9.71	CO03HO	17-May-19	9:10		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	11.14	CO03HO	17-May-19	9:42		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	11.34	CO03HO	17-May-19	10:14		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	10.31	CO03HO	17-May-19	10:43		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	9.41	CO03HO	17-May-19	11:10		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	11.46	CO03HO	17-May-19	11:35		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	10.44	CO03HO	17-May-19	12:17		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	11.34	CO03HO	17-May-19	12:46		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	9.64	CO03HO	17-May-19	13:12		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	11.24	CO03HO	17-May-19	13:59		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	11.71	CO03HO	17-May-19	14:44		Municipal Landfill _ Backfill		
17-May-19	M15 ENM soil	Soil	no electrical power/ no weighbridge/ e:	12.44	CO03HO	17-May-19	15:20		Municipal Landfill _ Backfill		
20-May-19	M15 ENM soil	Soil		29.06	DIMECH	20-May-19	7:25		Municipal Landfill _ Backfill		
20-May-19	M15 ENM soil	Soil		31.94	DIMECH	20-May-19	8:05		Municipal Landfill _ Backfill		
20-May-19	M15 ENM soil	Soil		31.96	DIMECH	20-May-19	8:44		Municipal Landfill _ Backfill		
20-May-19	M15 ENM soil	Soil		27.9	DIMECH	20-May-19	9:20		Municipal Landfill _ Backfill		
20-May-19	M15 ENM soil	Soil		30	DIMECH	20-May-19	10:00		Municipal Landfill _ Backfill		
20-May-19	M15 ENM soil	Soil		28.94	DIMECH	20-May-19	10:40		Municipal Landfill _ Backfill		
20-May-19	M15 ENM soil	Soil		28.34	DIMECH	20-May-19	11:27		Municipal Landfill _ Backfill		
20-May-19	M15 ENM soil	Soil		29.08	DIMECH	20-May-19	12:11		Municipal Landfill _ Backfill		
20-May-19	M15 ENM soil	Soil		29.6	DIMECH	20-May-19	12:30		Municipal Landfill _ Backfill		
20-May-19	M15 ENM soil	Soil		30.16	DIMECH	20-May-19	13:00		Municipal Landfill _ Backfill		
20-May-19	M15 ENM soil	Soil		29.3	DIMECH	20-May-19	14:08		Municipal Landfill _ Backfill		
20-May-19	M15 ENM soil	Soil		28.18	DIMECH	20-May-19	14:45		Municipal Landfill _ Backfill		
20-May-19	M15 ENM soil	Soil		28.88	DIMECH	20-May-19	15:20		Municipal Landfill _ Backfill		
20-May-19	M15 ENM soil	Soil		10.96	CO03HO	20-May-19	15:42		Municipal Landfill _ Backfill		
20-May-19	M15 ENM soil	Soil		10.42	CO03HO	20-May-19	14:57		Municipal Landfill _ Backfill		
20-May-19	M15 ENM soil	Soil		11.22	CO03HO	20-May-19	9:15		Municipal Landfill _ Backfill		
20-May-19	M15 ENM soil	Soil		11.62	CO03HO	20-May-19	8:45		Municipal Landfill _ Backfill		
20-May-19	M15 ENM soil	Soil		12.48	CO03HO	20-May-19	8:00		Municipal Landfill _ Backfill		
20-May-19	M15 ENM soil	Soil		11.7	CO03HO	20-May-19	7:30		Municipal Landfill _ Backfill		
21-May-19	P2 Car Park	Concrete		29.34	DIMECH	21-May-19	7:45	KM2/1	Municipal Landfill _ Backfill		
21-May-19	M15 ENM soil	Soil		31.28	DIMECH	21-May-19	8:21	KM3/1	Municipal Landfill _ Backfill		
21-May-19	M15 ENM soil	Soil		31.16	DIMECH	21-May-19	9:00	KM4/1	Municipal Landfill _ Backfill		
21-May-19	M15 ENM soil	Soil		29.52	DIMECH	21-May-19	9:45	KM5/1	Municipal Landfill _ Backfill		
21-May-19	M15 ENM soil	Soil		30.78	DIMECH	21-May-19	10:28	KM6/1	Municipal Landfill _ Backfill		
21-May-19	M15 ENM soil	Soil		31.68	DIMECH	21-May-19	11:04	KM7/1	Municipal Landfill _ Backfill		
21-May-19	M15 ENM soil	Soil		32.96	DIMECH	21-May-19	11:56	KM8/1	Municipal Landfill _ Backfill		
21-May-19	M15 ENM soil	Soil		31.16	DIMECH	21-May-19	12:37	KM9/1	Municipal Landfill _ Backfill		
21-May-19	M15 ENM soil	Soil		31.74	DIMECH	21-May-19	13:20	KM10/1	Municipal Landfill _ Backfill		
21-May-19	M15 ENM soil	Soil		31.76	DIMECH	21-May-19	14:58	KM11/1	Municipal Landfill _ Backfill		
21-May-19	M15 ENM soil	Soil		30.06	DIMECH	21-May-19	14:41	KM12/1	Municipal Landfill _ Backfill		

**APPENDIX 12**  
**NSW EPA APPROVAL**



DOC19/17103

Hydro Aluminium Kurri Kurri Pty Ltd  
ACN 093 266 221 ABN 55 093 266 221  
Via e-mail at: richard.brown@hydro.com

Attention: Mr Kerry McNaughton & Mr Richard Brown

21 January 2019

The Proper Officer

**Environment Protection Licence 1548  
Approval to exhume waste**

I refer to the email from Mr Shaun Taylor of Ramboll Australia Pty Ltd (Ramboll) dated 6 December 2018 regarding the exhuming and removal of waste from old waste deposition areas at Hydro Aluminium Kurri Kurri Pty Ltd ("Hydro") Smelter Site ("the Premises") as part of the ongoing demolition and remediation activities at the Premises. The exhuming of any waste from land that it was a landfill site now requires approval from the Environment Protection Authority (EPA) under Clause 110A of the *Protection of the Environment Operations (Waste) Regulation 2014* ("Regulation").

On 13 December 2018, the EPA and Ramboll met to discuss Ramboll's email with the EPA identifying several concerns regarding excavation methodology and unexpected finds, particularly of high toxicity materials such as organochlorine pesticides for example. On 8 January 2019, the EPA received a revised CMA Work Method Statement from Ramboll.

The EPA has reviewed the information and plans provided and finds it can approve the exhuming of waste subject to the following conditions:

1. The exhuming of waste is restricted to the old Municipal Landfill and other subsidence related waste deposition areas as proposed by Ramboll but does not include the old Dixon Road Landfill, exhuming of any waste from this area prohibited by clause 110A of the Regulation.
2. The exhuming of waste permitted by condition 1 above must be undertaken in accordance with the CMA's Work Method Statement dated 3/11/2018 Rev C as provided to the EPA by Ramboll on 8 January 2019 and Emergency Response Management Plan dated 10/11/2018 as provided to the EPA by Ramboll on 21 December 2018.
3. Prior to commencement of works the EPA must be provided with a signed copy of the Work Method Statement referred to in condition 2 of this approval.
4. All works associated with this approval are to be overseen by an appropriate qualified environmental scientist.
5. All works associated with this approval that relate to any asbestos containing material excavation, handling, movement and storage are to be overseen by a suitably qualified industrial hygienist and comply with all legislative requirements and codes of practices relating to asbestos.
6. The storage of any asbestos containing waste material is to be wetted down at all times to prevent asbestos fibres from becoming airborne or otherwise escaping, regardless of weather conditions.

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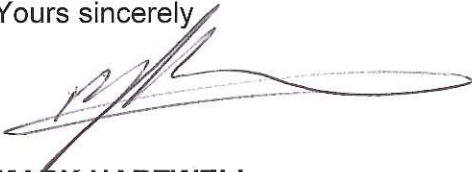
[www.epa.nsw.gov.au](http://www.epa.nsw.gov.au)  
[hunter.region@epa.nsw.gov.au](mailto:hunter.region@epa.nsw.gov.au)



- conditions, when the waste is not covered and must be covered with an impervious cover that will prevent the escape of all asbestos fibres or dust when works cease at the end of each day.
7. The storage must, once deposition from the former landfill sites is completed, be continually covered with an impervious cover that will prevent the escape of all asbestos fibres or dust. The cover must remain in place and intact until the waste is disposed of.
  8. The cover material must be suitable for its intended use and must not rip, tear or be damaged by exposure to any weather conditions that would allow dust or asbestos fibres to escape.
  9. All trucks are to be covered prior to leaving any waste exhumation area and must remain covered until arriving at the storage site.
  10. Truck tipping waste off at any location must not generate any visible dust or asbestos fibres.
  11. Any unexpected finds are to be immediately reported to the EPA's Environment Line Telephone Service on 131 555.
  12. A containment vessel shall be available at all times on or directly adjacent to any excavation site that is suitable to fully contain and isolate any unexpected finds.
  13. 72 hours prior to the commencement of any works associated with this approval, Hydro or its representatives must notify the EPA via [hunter.region@epa.nsw.gov.au](mailto:hunter.region@epa.nsw.gov.au) that the works are to commence.

If you have any questions about this matter, please contact Matthew Corradin on (02) 4908 6830.

Yours sincerely



**MARK HARTWELL**  
**Head Regional Operations Unit - Hunter**  
**Environment Protection Authority**

CC: Shaun Taylor