PHASE 1 ENVIRONMENTAL SITE ASSESSMENT

Proposed Huntlee Development
(within Cessnock Local Government area)

Prepared for Huntlee Pty Ltd

Prepared by RCA Australia

RCA ref 13148-402/2

June 2018

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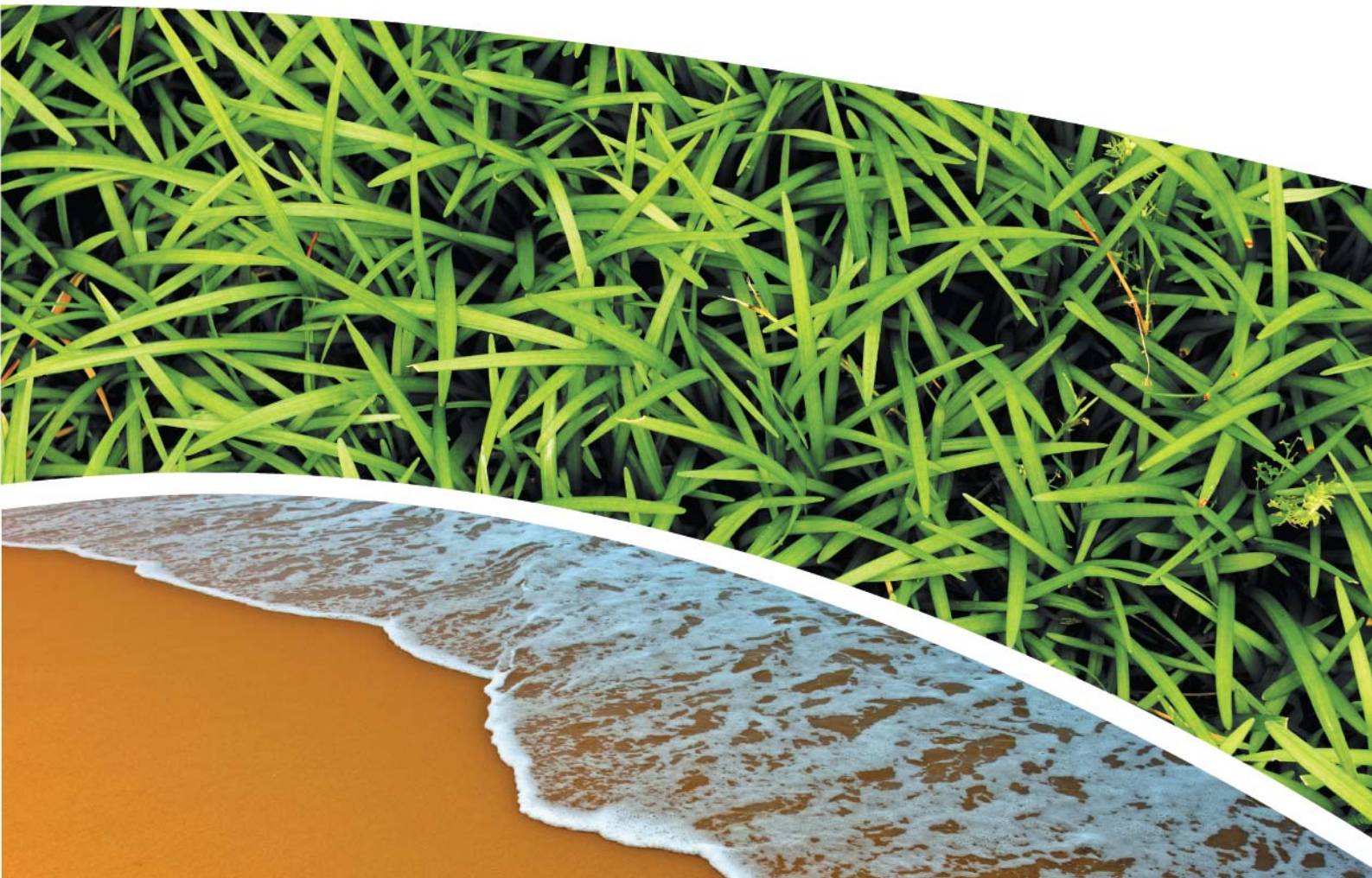

RCA AUSTRALIA
ABN 53 063 515 711

92 Hill Street, CARRINGTON NSW 2294

Telephone: +61 2 4902 9200
Facsimile: +61 2 4902 9299
Email: administrator@rca.com.au
Internet: www.rca.com.au

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RCA ref 13148-402/2

22 June 2018

Huntlee Pty Ltd
1 Triton Boulevarde
NORTH ROTHBURY NSW 2335

Attention: Mr Glenn Swan

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PHASE 1 ENVIRONMENTAL SITE ASSESSMENT
PROPOSED HUNTLEE DEVELOPMENT (WITHIN CESSNOCK LGA)
BRANXTON AND NORTH ROTHBURY, NSW

EXECUTIVE SUMMARY

This report presents the findings of a Phase 1 environmental site assessment (ESA) undertaken on four (4) investigation areas located in Branxton and North Rothbury, NSW.

The site areas are zoned 'B4 – Mixed Use', 'R1 – General Residential' and 'R2 – Low Density Residential', under the Cessnock Local Environmental Plan 2011 and proposed to become part of the Huntlee township development including a seniors living facility.

The purpose of this assessment was to identify any potential for contamination that may be determined from site history information, a site inspection and sample collection and analysis, with the aim of providing a report stating the suitability of the site for future proposed use.

The site inspection identified limited general waste on the areas assessed, however suspected-asbestos containing material was sampled from investigation Areas 3 and 4 and analysed for the presence/absence of asbestos.

One sample collected within timber waste on investigation Area 3 reported the presence of asbestos and two samples to the east of the homestead and within the loading ramp fill, reported the presence of asbestos. As such, RCA Australia (RCA) considers these materials and this general area to pose a potential risk to human health.

RCA recommends the removal and subsequent validation/clearance of these locations identified as containing asbestos contamination prior to further development of the site. It is recommended that such works be undertaken prior to, or in conjunction with, a construction certificate application for works in these locations.

RCA considers the site will be suitable for the proposed use following the remediation of the asbestos contaminated area.

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SUMMARY OF RESULTS

1 INTRODUCTION

This report presents the findings of a Phase 1 environmental site assessment (ESA) undertaken on four (4) 'investigation areas' located in Branxton and North Rothbury, NSW. Refer to **Drawing 1**, **Appendix A**.

It is understood that the land is proposed to become part of the Huntlee development for future residential and 'mixed' use. The land is zoned a mix of 'B4 – Mixed Use', 'R1 – General Residential' and 'R2 – Low Density Residential' under the Cessnock Local Environmental Plan 2011 (Ref [1]). It is further understood that the eastern most site (investigation Area 4) is proposed to become a retirement (old age) facility.

The purpose of this assessment was to identify any potential for contamination that may be determined from site history information and a detailed site inspection. RCA understands this is a requirement of a development application (DA) which is proposed to be submitted to Cessnock City Council. The objective of the assessment was to provide a report stating the suitability of the site for future residential/commercial use with recommendations for further assessment and/or remediation (if required).

RCA was requested to undertake this assessment by Mr Glenn Swan on behalf of Huntlee Pty Ltd.

2 SITE IDENTIFICATION AND DESCRIPTION

The site is located to the east and west of Wine Country Road in Branxton and North Rothbury, NSW. The site is divided in to four (4) investigation areas described as:

Table 1 *Site Investigation Areas*

Investigation Area	Lot/DP Number
(1)	Lot 11 DP 1137569 (portions of)
(2)	Lot 2 DP 1211767 (portions of) Lot 142 DP 1231921 (portions of)
(3)	Lot 143 DP 1231921 (portion of) Lot144 DP 1231921 (portion of)
(4)	Lot 140 DP 1231921 (portion of) Lot 142 DP 1231921 (portions of) Lot 240 DP 1105591

It is noted that the site areas considered in this report does not include those areas of Lot 11, Lot 142 or Lot 2 which comprise the quarry and/or former Ayrefield Colliery.

The site investigation boundaries are defined on **Drawing 1**, **Appendix A**. A summary of additional site details are shown in **Error! Reference source not found.**.

Table 2 *Summary of Site Details*

Current zoning (Ref [1])	B4 – Mixed Use R1 – General Residential R2 – Low Density Residential
Current use(s) **Proposed use**	Vacant (bushland) Residential, commercial, open space (although subject to change)
Size of site	Approximately 175ha
Land use to the: North	Generally M15 Hunter Expressway, associated link road and Main northern railway line
South	Generally former Ayrefield Colliery
East	Residential developments of Katherine's Landing and North Rothbury
West	Vacant , although generally proposed residential use
Nearest sensitive receptor (human health)	Residential dwellings of Katherine's Landing and North Rothbury closely bordering the southern boundary
Nearest sensitive receptor (environmental)	Unnamed tributaries across the site leading to Anvil Creek (east) or Black Creek (west)

3 SITE HISTORY AND BACKGROUND INFORMATION

3.1 SITE NOTIFICATIONS

The Section 149 (2) Planning Certificates as specified under the *Environmental Planning and Assessment Regulation 2000* (Schedule 4) includes information associated with any restrictions for the use of the land.

Information relevant to this obtained from the S 149 Certificates, dated 15 September and 10 October 2017 and relevant to the site is contained in Error! Reference source not found..

Table 3 *Planning Advice Contained In the 149 Certificate*

Part 2 relevant Information	The site is affected by: • Cessnock LEP 2013. • Hunter Regional Plan 2036. • Cessnock DCP 2010. • Huntlee DCP 2013. • Multiple SEPPs including SEPP 55 – Remediation of land. • Applicable 'R1 – General Residential' and 'B4 – Mixed Use' zoning restrictions • Bushfire prone land. • Development Contributions Plan. • Complying development restrictions. The site is not affected by: • Minimum land dimensions. • Environmental issues including: critical habitat, conservation covenants, coastal protection, *heritage and contamination, land slip, tidal inundation, acid sulfate soils, biodiversity certification or stewardship, land clearing set aside, PVPs, tree orders and Part 3A. • Flooding. • Mine subsidence. • Road widening. • Acquisition by a public authority. • Paper subdivision. • Site verification and/or capabilities certificates.
Part 5 relevant Information	• The site is affected by a Tree Preservation Order. • The site is not affected by Noise Exposure.

*It is noted that the heritage and contaminated land issues on Lot 11, Lot 142 and Lot 2 pertaining to the quarry and/or former Ayrefield Colliery, do not form part of this assessment.

RCA does not consider the information available within the Section 149 Planning Certificates to indicate contaminated land at the site.

3.1 HISTORICAL AERIAL PHOTOGRAPHS

RCA reviewed historical aerial photographs and **Error! Reference source not found.** summarises the observations at the site and the surrounding environment.

Table 4 *Aerial Photograph Review*

1952 (black and white)	The site appears undeveloped with forest type vegetation across the entire site. There are two bare patches of ground along the north western boundary although these appear to be on the neighbouring site. Surrounding the site there appears to be a structure/s to the west between the site and Wine Country Road. The townships of Branxton and North Rothbury are visible to the north west and south west respectively. The Main Northern railway line is present to the north of the site and Wine Country Drive to the west. Surrounding land use includes rural residential immediately west and vacant use (bushland) more generally.
1963 (black and white)	The site and surrounds appear similar to the 1952 photograph
1974 (black and white)	The site appears similar to the 1952 and 1963 photographs. Land use surrounding the site generally appears unchanged from the 1963 photograph although substantial vegetation clearing has occurred to the south east of the site.
1984 (black and white)	The site appears similar to the 1963 and 1974 photographs with the addition of an access track along a portion of the north eastern boundary of the site. Surrounding the site there are two industrial sized sheds (presumed to be poultry production sheds) located to the west of the site. The Ayrefield Colliery is now visible to the south west.
1994 (colour)	The site and surrounds remain similar to the 1984 photograph. Surrounding the site there appear to be two (2) new structures present – one (1) to the mid-west and one (1) south of the resumed poultry sheds. Both structures are presumed to be the current residential dwellings in those locations.
1998 (colour)	The site and surrounds remain similar to the 1994 photograph
2000 (colour)	The site and surrounds remain similar to the 1998 photograph although the presumed poultry production sheds are no longer present
2004 (colour)	The site and surrounds remain similar to the 1998 and 2000 photographs
2010 (colour)	The site and surrounds remain similar to the 2000 and 2004 photographs
2017 (colour) Drawing 1	The site and surrounds remain similar to the 2004 and 2010 photographs with the addition of the M15 Hunter Expressway works to the north and Huntlee residential construction works to the south

Reviewed documentation is included in **Appendix B**.

3.2 CONTAMINATED LAND PUBLIC RECORD

RCA undertook a search of the NSW EPA public lands register (epa.nsw.gov.au/publicregister/) and did not find any record of Environment Protection licences, applications, notices, audits or pollution studies and reduction programmes applicable to the site (areas of investigation). The closest notified site (Area no. 3082) is the former Ayrefield Colliery located directly adjacent to some portions of the site. RCA does not consider potential contamination from the Ayrefield Colliery to have, or is likely to, impact on the areas investigated during this assessment.

RCA undertook a search of sites notified to the EPA as potentially requiring regulation (epa.nsw.gov.au/clm/publiclist.htm as updated 6 September 2017) and confirmed that the areas investigated during this assessment are not notified. The closest notified site is a former service station located in Maitland Street, Branxton approximately 1.5km north west and therefore RCA does not consider that it will have an effect on the site.

RCA undertook a search of the NSW EPA gasworks database (epa.nsw.gov.au/clm/gasworkslocation.htm) and determined that there are no gasworks within 5km of the site.

3.3 PREVIOUS INVESTIGATIONS

RCA has not been provided with any previous contamination reports covering the areas of investigation discussed in this report.

3.4 ANECDOTAL INFORMATION

There was limited anecdotal evidence of past site use or potentially contaminating activities, other than the use of potential asbestos containing building materials used in the construction of the former homestead and associated buildings. Given the investigation areas have largely been vacant bushland there was considered low potential for contamination to have impacted the site areas.

3.5 GEOLOGY AND HYDROGEOLOGY

RCA reviewed published geological and hydrogeological maps and summarised the findings in **Error! Reference source not found.**.

Table 5 *Geology and Hydrogeology*

Soil/Geology	Permian aged Branxton formations of sandstone, siltstone, conglomerate and erratics of the Maitland Group. Permian aged Farley formations of sandstone mudstone, siltstone and erratics of the Dalwood Group.
Acid sulfate soil	No acid sulfate soil risk maps exist for the area
Groundwater use	No registered bores were found within 500m of the site based on a search of the NSW Office of Water groundwater bore data map (allwaterdata.water.nsw.gov.au/water.stm). However, it is noted that there is a possibility for unregistered bores used in the wider area.
Number of monitoring wells on site	Nil
Depth to groundwater	Unknown
Estimated groundwater flow direction	Unknown, although presumed to be towards the west based upon site topography.
Background water quality	Unknown

The groundwater bore search map is attached in **Appendix C**.

3.6 INTEGRITY ASSESSMENT

Information obtained from the S 149 Certificate is assumed to be accurate but is limited to details Council has recorded and documented.

Information obtained from aerial photography is limited in that it only provides a snapshot of the site in time. However, RCA considers that adequate coverage was achieved for this investigation with aerial photographs available approximately every decade and with relatively minor changes occurring between photographs. Aerial photographs indicate the areas of investigation have remained undeveloped between 1952 and 2017, therefore RCA considers there is minimal risk of not identifying potential contaminating activities during the assessed period.

Hydrogeological information obtained from the NOW is sourced from third parties and has an inherent risk or errors. For the purposes of this report it is considered that the information supplied by NOW is representative and adequate.

It is noted that there were limitations to the site inspection undertaken due to the presence of dense forest vegetation in some portions and it is therefore considered that there is some potential for contamination sources to be present on site which were not observed.

Overall, RCA considers that the site history reviewed is accurate and adequate given the past nature of land use at the site.

RCA considers there is sufficient information available from the site history review and site inspection to determine potentially contaminating activities at the site.

4 PRELIMINARY CONCEPTUAL SITE MODEL

Based on RCA's understanding of the site, the potential contamination, exposure pathways, and receptors are considered as follows:

- Illegal dumping of waste and asbestos-containing building materials:
    - This may have resulted in surface soil contamination. Contaminants of concern are considered to be hydrocarbons, metals and asbestos.
    - The risks associated with this contamination are considered to be from ingestion and dermal contact. The risk associated with inhalation of asbestos fibres are considered to be due to direct inhalation and/or secondarily from adhered fibres on equipment and clothing.
    - Off site impacts are considered unlikely.

RCA does not consider acid sulfate soils to be an issue based on available acid sulfate soil risk maps.

RCA does not consider potential contamination has, or will, originate from adjacent/nearby sites and which would impact this site.

5 SAMPLING AND ANALYTICAL QUALITY PLAN

No formal sampling and analytical quality plan (SAQP) was developed for this assessment. The scope of work involved a review of site history information and detailed site inspections with sampling undertaken to assess any suspected or potential contamination sources observed. The following sections detail the basis for the scope.

5.1 STEP 1 – STATE THE PROBLEM

Based on a review of historical information, there is potential for hydrocarbon, metals and asbestos contamination arising from illegal dumping of waste. The presence and extent of such contamination (if any) is unknown.

5.2 STEP 2 – IDENTIFY THE GOALS AND DECISIONS

The key uncertainties that the investigation attempted to address were:

- Do any concentrations of potential contaminants (hydrocarbons, metals and asbestos) exceed acceptable levels?
- Location of any current and/or former contamination source/s.

In order to achieve these uncertainties, decisions had to be made as to the presence and significance of potential contamination such that management measures could be designed to reduce the risk. The specific decisions to be made were to be as follows:

- Determine past and present potential contamination sources.
- Determine the nature of contamination.
- Determine the geology and hydrogeology.
- Determine the potential and actual contaminant migration routes.
- Determine the lateral and vertical extent of contamination.

- Determine whether contaminants exceed acceptable levels.
- Determine whether further investigation or management is required.

5.3 STEP 3 – IDENTIFY INPUTS TO THE DECISIONS

The specific types of information needed to resolve the decision statements in Step 3 were noted as follows:

- Analytical data for the collected samples.
- Appropriate assessment criteria for the media being investigated.
- Appropriate field methods.
- Appropriate laboratory analysis methods.

The ASC NEPM (Ref [2]) document has been approved by the NSW EPA for use on potentially contaminated sites and supersedes most of the preceding reference documents.

Best practice in alignment with council's requirements under SEPP 55 (Ref [3]) prescribes assessment on the basis of the most sensitive allowable site use. Currently the site is vacant and, based on information provided to RCA, the proposed use will allow for residential living. RCA therefore considers the criteria as defined for residential land use to be appropriate for assessment of human health risk from the soil at the site. The ecological risk was to be assessed under the criteria defined for residential land use.

Full details of the relevant guidelines are included in **Appendix D**.

5.4 STEP 4 – DEFINE THE BOUNDARIES OF THE INVESTIGATION

The horizontal extent of the assessment has been defined by the 'site boundary' lines of the four (4) investigation areas as shown in the site plan (**Drawing 1, Appendix A**). The investigation is bounded by:

- North – Adjoining Lot containing Hunter Expressway link road.
- South – Triton Boulevarde and Huntlee residential development.
- East – Adjoining Lots – Huntlee residential development.
- West – The current north/south orientated tree line generally running down the centre of Lots 143 and 144.

The vertical extent has been determined by consideration of the former land uses and limited to the ground surface.

Practical constraints that could interfere with sampling include:

- Woody vegetation.
- Vehicle access.

5.5 STEP 5 – DEVELOP THE DECISION RULES

The Data Quality Indicators (DQI) that were implemented for the project are detailed in **Error! Reference source not found.6**.

Table 6 *Data Quality Indicators Implemented for the Assessment*

DQI	Determined by	Criteria
Completeness	The percentage of completed data points, taking in account consideration of other DQI	95%
Representativeness	Whether there has been sufficient sampling by appropriate methodology with relevant analysis to determine that the assessment is representative of the site conditions	
Comparability	• All samples collected during this sampling programme will be obtained by adequately trained RCA personnel using consistent sampling methodologies throughout the project. • All samples must be received by the laboratory appropriately packaged for the requested analysis. • All laboratory analyses will be conducted by NATA accredited methodologies that comply with the international standard methods referred to in the ANZECC (2000) and ASC NEPM (2013) guidelines.	

5.6 STEP 6 – ACCEPTABLE LIMITS ON DECISION ERRORS

If the data received has not been in accordance with the defined acceptable limits outlined in Step 5, it may have been considered to be an estimate or be rejected. Determination of whether this data was suitable for use or, if re-sampling was required, will have been based on the following considerations:

- Closeness of the result to the guideline concentrations.
- Specific contaminant of concern (eg, response to carcinogens may be more conservative).
- The area of site in question and the potential lateral and vertical extent of questionable information.
- Whether the uncertainty can be effectively managed by site management controls.

If any of the data validation procedures or criteria identified were not followed or met, this will have constituted a non-conformance. The significance of the non-conformance would have determined if rectification was required.

5.7 STEP 7 – OPTIMISATION OF THE DESIGN OF THE COLLECTION OF DATA

The derived scope of work has comprised seven (7) bulk sampling locations based upon a judgemental sampling pattern to provide characterisation of potential asbestos contamination observed during site inspection.

Samples were collected directly from the ground surface.

Decontamination of soil sampling equipment was not relevant.

Bulk samples were to have been laboratory analysed for asbestos (presence/absence).

Bulk samples were to have been double bagged due to their potential to contain asbestos fibres. All samples were to have been sent to the laboratory within 24 hours of sampling under Chain of Custody (COC) documentation.

ALS was to have been used as the analysing laboratory for all analyses due to its NATA accreditation and experience with potentially contaminated materials.

A summary of the sampling strategy is presented in **Table 7**.

Table 7 *Summary of Sampling Strategy*

Contaminating activity	Potential Contaminants of Concern (PCoC)	Sampling Strategy	Rationale for Sampling Strategy and Sampling Locations
Illegal dumping	Asbestos	RCA had allowed for the analysis of all potential asbestos samples found during site inspection.	Samples selected based on visual assessment to assist in determining presence/absence of asbestos.

Sample locations shown on **Drawing 1**, **Appendix A**.

6 FIELDWORK AND LABORATORY ANALYSIS

Two (2) environmental scientists experienced in the handling of potentially contaminated sites undertook the fieldwork on 11 and 23 October 2017. The scope of work included:

- A site 'drive over' of all 4WD accessible tracks upon each of the four (4) investigation areas.
- Photographing and recording of anthropocentric waste.
    - Seven (7) samples of fibrous cement sheeting fragments were collected and laboratory analysed for the presence/absence of asbestos. Three (3) of these samples were collected from investigation Area 3, with four (4) samples collected from investigation Area 4. No potential asbestos-containing materials were observed during the inspection of investigation Areas 1 and 2.
- Photographing and recording of anthropocentric structures/infrastructure (current and former).

A summary of site conditions and observations made during the site inspection are outlined in **Error! Reference source not found.8**.

Table 8 *General Site Conditions and Observations*

Topography	The site Areas (1-4) are generally flat with some slight sloping. Area (1) has a gentle slope to the east, whilst Area (2) has a low ridge line passing through in a north south direction. Refer to **Photographs 1-4** for general site area, **Appendix E**. Surface water flow is expected to generally be towards: • Area 1 - east • Area 2 – north and west. • Area 3 – east and south. • Area 4 – West.
Site condition	The sites are almost entirely vegetated with native, open forest vegetation. No water bodies were observed with the exception of a small dam in the south eastern portion of Area 3 (**Photograph 5**). Tributaries/drainage lines were observed to have no flow.
Condition of building and roads	Unsealed access tracks in fair condition. Tracks generally observed to be on natural material with no imported fill. No buildings present although several concrete slab foundations of former buildings were observed in the central western portion of Area 4 (**Photograph 6**).
Visual signs of contamination	Nil observed
Signs of erosion	Nil observed
Presence of drums or waste	The site has multiple areas of waste including metal, rubber, plastic, wood and building materials. These vary from individual items such as car wheels to stockpiles of metal, wood and general refuse. These are generally scattered through the site although are more concentrated to the east of the former homestead located in the mid-western area of the site. Refer to **Photograph 2**, **Appendix E**.
Identification of potential asbestos bearing materials	Fibrous cement sheeting fragments were found in five separate locations during the inspection of the four site areas. Flat sheeting around an area containing waste car tyres located west of the former homestead on Area 4. It is noted that this area was partially cordoned off with 'Caution Asbestos' plastic tape (**Photograph 7**). Flat sheeting around a concrete slab foundation located west of the former homestead on Area 4. Refer to (**Photograph 8**). Corrugated sheeting within fill material used to construct a loading ramp located south east of the former homestead (**Photograph 9**). Flat sheeting fragments observed within timber and general waste stockpiles located in the southern portion of Area 3 (**Photograph 10**). Flat sheeting observed in a general waste pile located central eastern portion of Area 3 (**Photograph 5**).
Visible signs of plant stress	Nil observed
Odours noticeable on site	Nil observed

Evidence of current or former petroleum facilities	Nil observed
Chemicals stored on site	Nil observed
Evidence of waste burial: (anecdotal or otherwise)	Nil observed

7 QUALITY CONTROL

RCA has assessed the quality assurance and control in **Appendix F** and found it to be acceptable for the purpose of site assessment.

8 RESULTS

All results are compared to the relevant criteria in **Appendix G**. Full results are present in **Appendix F**. In summary:

- Area 3 samples:
  - Sample 403-1 (timber waste area – 15mm thick fragment) reported no presence of asbestos.
  - Sample 403-2 (timber waste area- 4mm thick fragment) reported the presence of chrysotile asbestos fibres.
  - Sample 403-3 (area near pond) reported no presence of asbestos.
- Area 4 samples:
  - Sample 404-1 (area near car tyres northeast of former homestead) reported no presence of asbestos.
  - Sample 404-2 (area near concrete slab east of former homestead) reported the presence of chrysotile asbestos fibres.
  - Sample 404-3 (loading ramp) reported the presence of amosite and chrysotile asbestos fibres.
  - Sample 404-4 (area near concrete slab south of former homestead) reported no presence of asbestos.

9 SITE CONTAMINATION CHARACTERISATION

RCA considers the assessment methods undertaken to be adequate for the characterisation of the majority of site based on previous site use where the vast majority of the site has remained vacant for approximately the past sixty (60) years with the exception of the former homestead in investigation Area 4. RCA does not consider that the general waste items located across the investigation areas pose a risk to human health or the environment but recommends their removal off site (for aesthetical and logistical reasons) as general solid waste prior to any construction works commencing. Such areas would then be considered suitable for future ‘mixed’ use.

The exception to the above are the area to the east of the former homestead containing asbestos sheet fragments, general waste, an earthen loading ramp and several concrete slab foundations. Two (2) of the four (4) fibrous cement sheet fragments collected from this location were confirmed by the laboratory to contain asbestos. Another area where asbestos was identified in a fibrous cement sheet fragment was the timber waste located in the southern portion of investigation Area 3. Therefore RCA considers these materials and this general area to pose a risk to human health. Refer to **Drawing 1, Appendix A**.

Asbestos sample collection was limited to bulk samples of visually observed contamination. With the exception of corrugated sheeting within the loading ramp, no other evidence of waste burial was observed. RCA recommends the asbestos fragments identified in the area east of the former homestead be further delineated and then removed from site. Appropriate validation/clearance of the identified impacted areas should be undertaken following the completion of removal works. Asbestos containing materials are required to be disposed of to an appropriately licenced waste disposal facility as 'special waste (asbestos)'. Such works should occur prior to any construction works commencing and be in accordance with state legislation for the removal of asbestos as well as the NSW EPA Waste Classification guidelines (Ref [3]).

RCA recommends asbestos delineation, removal and validation works be part of a construction certificate application for any works to occur in the two areas discussed above.

Whilst it cannot be determined by RCA when the concrete slab foundations and associated structures were constructed, it is presumed that each concrete slab foundation was constructed prior to or at the time of structure erection. RCA therefore considers potentially contaminating activities conducted in these locations which may have contaminated surface soils to have been limited due to the concrete placement.

RCA considers the potential for contamination sources which were not observed during the site history assessment and/or site inspection, to be negligible.

10 CONCLUSIONS

This report has presented the findings of an assessment undertaken at across the four (4) investigation areas described in this report. The assessment comprised a desktop review of historical information, a site inspection of each investigation area and the sampling and analysis of bulk fibrous cement sheet fragments to determine the presence and extent of any environmental contamination and determine the suitability prior to future 'mixed use'.

Laboratory analysis of seven (7) bulk fibrous cement sheet fragments from two locations on investigation Area 3 and four (4) locations on investigation Area 4. One sample collected within timber waste on investigation Area 3 reported the presence of asbestos, and two samples to the east of the homestead and within the loading ramp fill, reported the presence of asbestos. As such, RCA considers these materials and this general area to pose a potential risk to human health.

RCA recommends the removal and subsequent clearance of these locations identified as containing asbestos contamination prior to further development of the site. Further, RCA recommends asbestos removal and validation works be part of a construction certificate application for any works in those areas.

RCA considers the site will be suitable for the proposed use following the remediation of the asbestos contaminated area.

11 LIMITATIONS

This report has been prepared for Huntlee Pty Ltd in accordance with an agreement with RCA dated 28 September 2017. The services performed by RCA have been conducted in a manner consistent with that generally exercised by members of its profession and consulting practice.

This report has been prepared for the sole use of Huntlee Pty Ltd. The report may not contain sufficient information for purposes of other uses or for parties other than Huntlee Pty Ltd. This report shall only be presented in full and may not be used to support objectives other than those stated in the report without written permission from RCA.

The information in this report is considered accurate at the date of issue with regard to the current conditions of the site. Conditions can vary across any site that cannot be explicitly defined by investigation.

Environmental conditions including contaminant concentrations can change in a limited period of time. This should be considered if the report is used following a significant period of time after the date of issue.

Yours faithfully

RCA AUSTRALIA

Nic McLaughlin
Environmental Scientist

Matthew Clark
Associate Environmental Scientist

12 REFERENCES

[1] *Cessnock Local Environment Plan 2011, Land Zoning Map LZN_005A,* under the Environmental Planning and Assessment Act 1979.

[2] NEPC, *National Environment Protection (Assessment of Site Contamination) Measure*, 1999 as amended 2013.

[3] NSW EPA, *Waste Classification Guidelines*, *Part 1; Classifying Waste*, November 2014.

[4] Department of Urban Affairs and Planning, *State Environmental Planning Policy (SEPP 55): Remediation of Land*, August 1998.

13 GLOSSARY

ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure.
EIL	Ecological investigation level. Relates to soil concentrations which may pose a risk to ecological health.
ESL	Ecological screening level. Relates to vapour risk from petroleum hydrocarbons which may pose a risk to ecological health.
HIL	Health investigation level. Relates to soil concentrations which may pose a risk to human health in soil.
HSL	Health screening level. Relates to the vapour risk from petroleum hydrocarbons which may pose a risk to human health in soil. Also relates to exposure to asbestos fibres.
ISL	Investigation screening levels for soil. Comprised of HIL/EIL and HSL/ESL
kg	kilogram, 1000 gram.
LEP	Local environment plan. A planning tool for the Local Government.
NOW	NSW Office of Water.
NSWEPA	NSW Environment Protection Authority – formerly a component of DECC, DECCW, OEH but made a separate entity in 2011 to regulates the contaminated land industry.
PQL	Practical Quantitation Limit.
RPD	Relative Percentage Difference.

Appendix A

Drawing

(1)

Village 2
116.95ha

(3)

Town Centre
194.58ha

403-3

403-2
403-1

Quarry

Stage 1
Huntlee Town Centre

404-1
404-4
404-2
404-3

(4)

(2)

Ayrefield Colliery

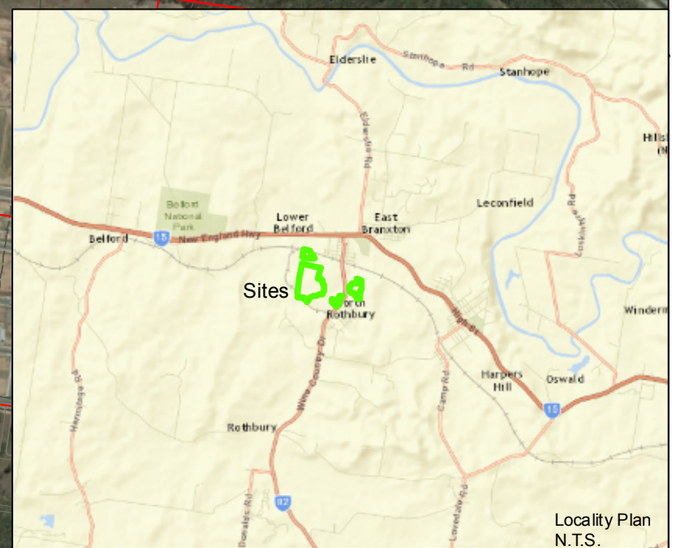
Katherines
Landing

Singleton LGA

Cessnock LGA

Coal Waste Stockpiles

Village 4
74.0ha



LEGEND

- Approximate site boundary location
- Singleton/Cessnock LGA boundary
- (1) Areas of investigation
- Approximate fibrous cement sheet fragment sample location
- Approximate location of waste tyres
- Approximate area of timber disposal (some general waste)

N

0 160 320 480 640
metres

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

SITE AND SAMPLE LOCATION PLAN
PHASE 1 ENVIRONMENTAL SITE ASSESSEMNT
PROPOSED HUNTLEE DEVELOPMENT AREA
NORTH ROTHBURY

CLIENT	Huntlee Pty Ltd			RCA Ref	13148-402/2
DRAWN BY	NM	SCALE	1:10,000 (A3)	DRAWING 1	REV 1
APPROVED BY	MC	DATE	21/06/2018	OFFICE	NEWCASTLE

Appendix B

Aerial Photographs

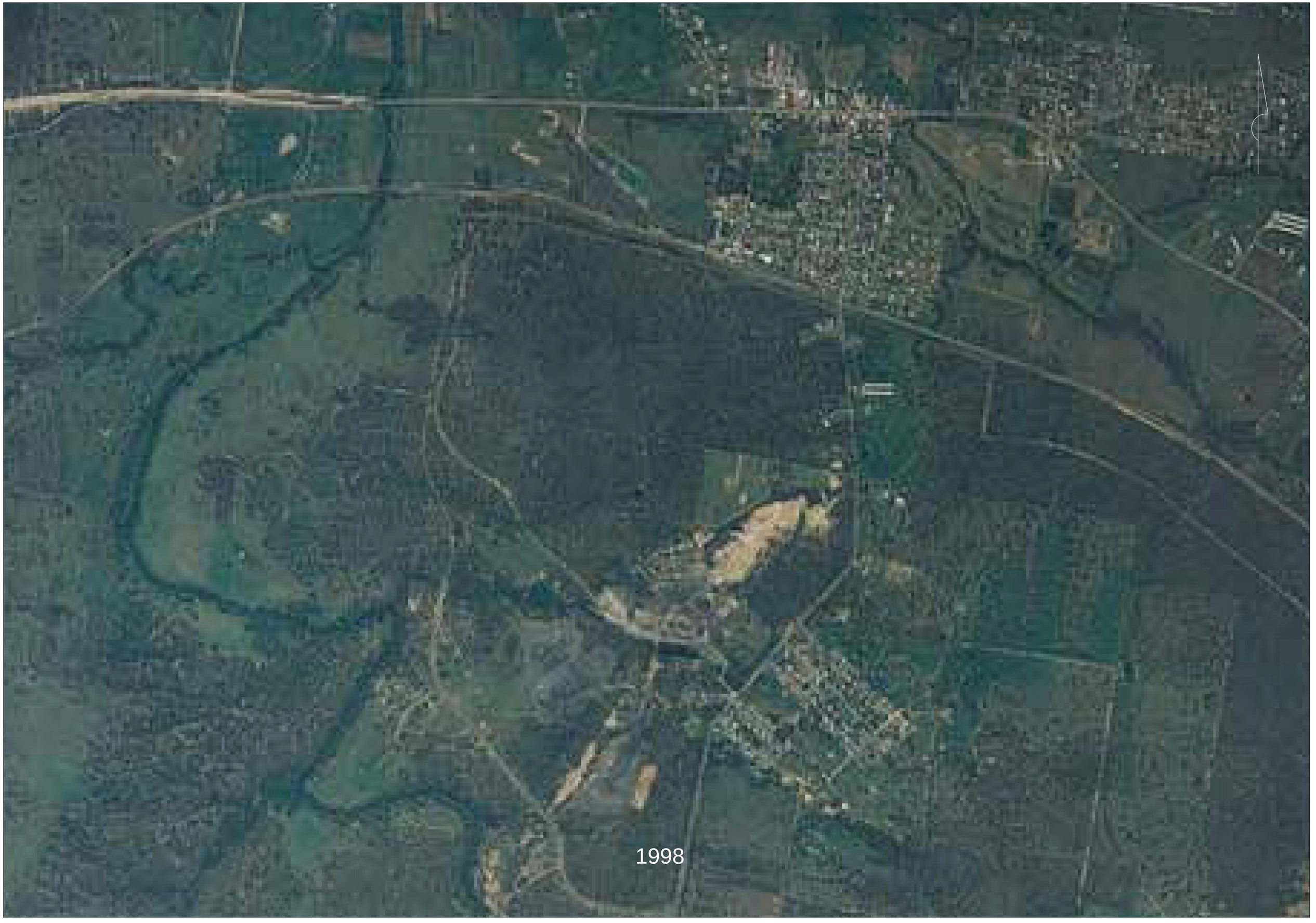
1952


1963


1974

1984


1994


1998


2000


2004

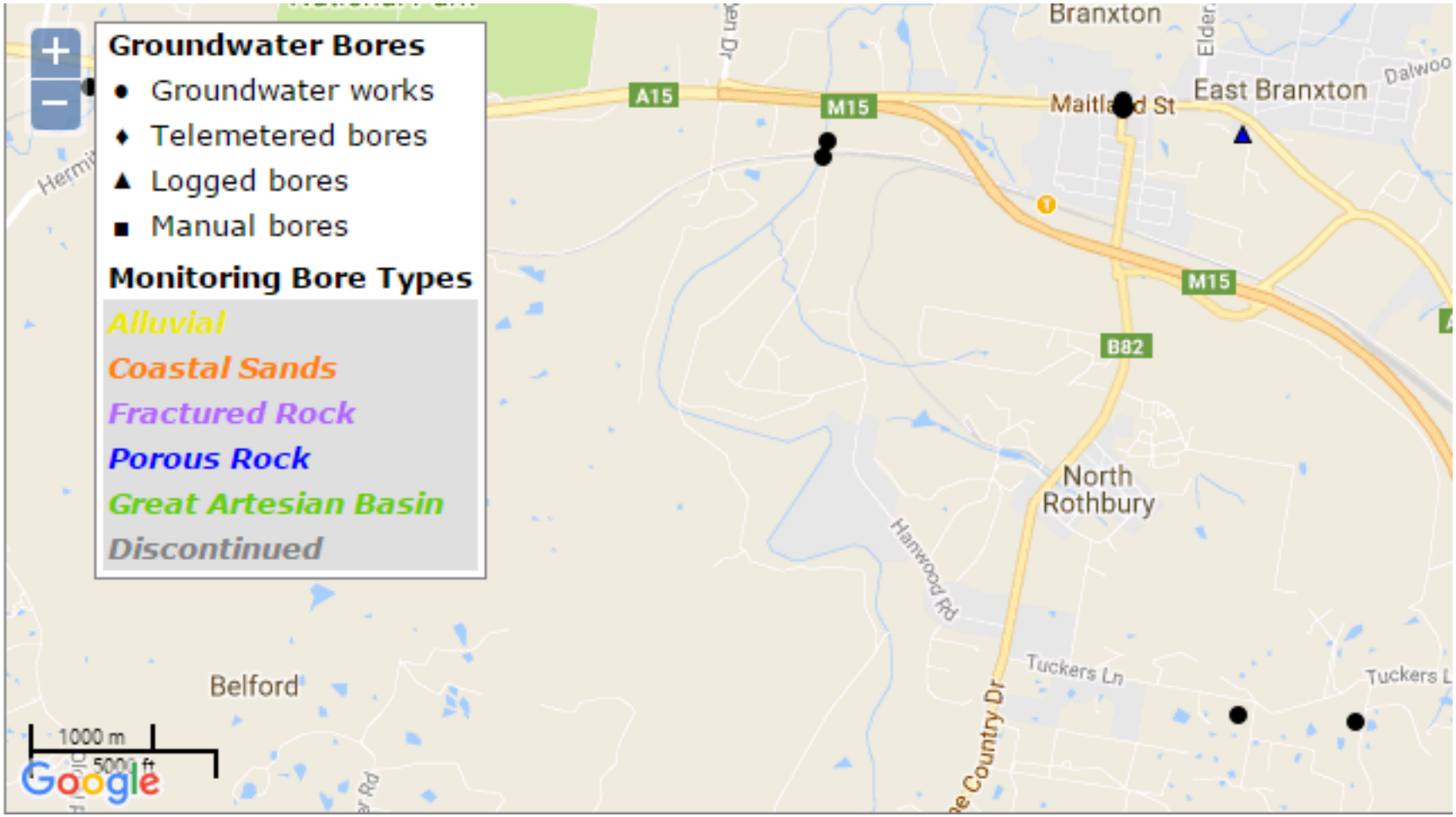

2010


2017

Appendix C

Registered Groundwater Well Map

NSW Office of Water – Groundwater Bore Search Map



Appendix D

Screening Levels and Guidelines

NATIONAL ENVIRONMENT PROTECTION (ASSESSMENT OF SITE CONTAMINATION) MEASURE 1999 AS AMENDED 2013

The investigation and screening levels (ISL) utilised for the assessment of the soil on site were sourced from the National Environment Protection Measure for the Assessment of Site Contamination (ASC NEPM, Ref [2]). These ISL are not derived as acceptance criteria for contamination at a site, but as levels above which specific consideration of risk, based on the site use and potential exposure, is required. If a risk is determined as present, then remediation and/or management must be undertaken.

Assessment ISL are based on:

- Human Health.

  Intentionally conservative health investigation levels (HIL) have been derived for four (4) generic land use settings.

  - HIL 'A' - Residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake (no poultry). This category includes children's day care centres, preschools and primary schools.
  - HIL 'B' - Residential with minimal opportunities for soil access includes dwellings with fully and permanently paved yard space such as high rise buildings and flats.
  - HIL 'C' - Public open space such as parks, playgrounds, playing fields (eg, ovals) secondary schools and footpaths. It does not include undeveloped public open space (such as urban bushland and reserves).
  - HIL 'D' - Commercial/industrial such as shops, offices, factories and industrial sites.

The exposure scenario for the derivation of the relevant land use setting is/are set out in the table below.

Health screening levels (HSL) have been determined for risks associated from asbestos containing materials. The HSL for bonded asbestos containing material is based on the land use settings detailed above, however the following HSL also apply:

- Total of Fibrous asbestos and Asbestos fines – less than 0.001%.
- No visible asbestos in surface soil – or where an area is likely to be disturbed during any proposed works.
- Aesthetics -

  Aesthetic considerations operate separately to the HIL/HSL and EIL/ESL assessment. Issues to be considered include:

  - Highly malodorous soils or extracted groundwater (eg, strong residual petroleum hydrocarbon odours, hydrogen sulphide in soil or extracted groundwater, organosulfur compounds).
  - Hydrocarbon sheen on surface water.
  - Discoloured chemical deposits or soil staining with chemical waste other than of a very minor nature.
  - Large monolithic deposits of otherwise low-risk material, eg, gypsum as powder or plasterboard, cement kiln dust.

- Presence of putrescible refuse including material that may generate hazardous levels of methane such as a deep-fill profile of green waste or large quantities of timber waste.
- Soils containing residue from animal burial (eg, former abattoir sites).

Site assessment requires consideration of the quantity, type and distribution of foreign material or odours in relation to the specific land use and its sensitivity. For example, higher expectations for soil quality would apply to residential properties with gardens compared with industrial settings.

Tier 1 assessment comprises the comparison of the soil data with the HIL/HSL and EIL/ESL. In the event that some concentrations are in excess of the relevant criteria, the summary statistics of the data set may be utilised for assessment purpose. Consideration of a range of statistics is recommended; at a minimum the 95%UCL_{ave} should be compared to the relevant criteria as long as:

- No single value exceeds 250% of the relevant criterion.
- The standard deviation of the results for each analyte is less than 50% of the relevant criterion.

Residential with Garden/Accessible soil

Summary of Exposure Pathways	Abbreviations	Units	Parameters	
			Adult	Child
Body weight	BW_A or BW_C	kg	70	15
Exposure duration	ED_A or ED_C	years	29	6
Exposure frequency	EF	days	365	365
Soil/dust ingestion rate[1]	IR_{SA} or IR_{SC}	mg/day	50 [2]	100 [2]
Soil/dust to skin adherence factor	AF	$mg/cm^2/day$	0.5	0.5
Skin surface area	SA_A or SA_C	cm^2	20 000	6100
Fraction of skin exposed	F_s	%	31.5	44.3
Dermal absorption factor	DAF	%	Chemical specific values applied	
Time spent indoors on site each day	ET_i	hours	20	20
Time spent outdoors on site each day	ET_o	hours	4	4
Home-grown fraction of vegetables consumed	F_{HG}	%	10	10
Vegetable & fruit consumption rate	C_y (veg and fruit)	g/day	400	280
Averaging time for carcinogens ('lifetime')	AT_{NT}	years	70	70
Dust lung retention factor	RF	%	37.5	37.5

Soil ingestion rates for children are based on a child aged two to three years where normal hand-to-mouth activity is assumed and does not account for pica behaviour.

Soil ingestion rates for the HIL 'A' scenario include the ingestion of both outdoor soil, including soil adhering to home-grown produce, and indoor dust (derived from outdoor soil tracked indoors).

Appendix E

Site Photographs

PHOTOGRAPH 1 *General site topography of Area 1 (northern portion facing south west)*

PHOTOGRAPH 2 *General topography of Area 2 (eastern portion facing south)*

PHOTOGRAPH 3 *Waste metal and oil filter (eastern area of Lot 140)*

PHOTOGRAPH 4 *General topography of Area 4 (eastern portion facing west)*

PHOTOGRAPH 5 *General waste pile (foreground) small dam (background) – southern portion of Area 3. (Sample 403-3 collected from general waste)*

PHOTOGRAPH 6 *Example of concrete slabs present on Area 4 (central west portion of site)*

PHOTOGRAPH 7 *Waste material on Area 4 where fibrous cement sheet fragments were observed – central west portion. (Sample 404-1 collected)*

PHOTOGRAPH 8 *Fibrous cement sheeting fragments on Area 4 – north west portion. (Sample 404-2 collected)*

PHOTOGRAPH 9 *Corrugated fibrous cement sheeting within the loading ramp – central west portion of Area 4. (Sample 404-3 collected).*

PHOTOGRAPH 10 *Waste woody debris in southern portion of Area 3 (Samples 403-1 & 403-2 collected).*

Appendix F

Laboratory Report Sheets

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1725481**	Page	: 1 of 10
Client	: **ROBERT CARR & ASSOCIATES P/L**	Laboratory	: Environmental Division Sydney
Contact	: MR MATT CLARK	Contact	: Customer Services ES
Address	: P O BOX 175 CARRINGTON NSW, AUSTRALIA 2294	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 4902 9200	Telephone	: +61-2-8784 8555
Project	: HUNTLEE	Date Samples Received	: 12-Oct-2017 12:28
Order number	: 13148	Date Analysis Commenced	: 13-Oct-2017
C-O-C number	: ----	Issue Date	: 18-Oct-2017 15:30
Sampler	: MATT CLARK, NIC McLAUGHLIN		
Site	: ----		
Quote number	: SYBQ/265/16		
No. of samples received	: 10		
No. of samples analysed	: 10		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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.

Signatories	*Position*	*Accreditation Category*
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Gerrad Morgan	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, 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.

- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Ch' Chrysotile (white asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- 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.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	402-2	402-3	402-4	405-1A	----
				Client sampling date / time	11-Oct-2017 00:00	11-Oct-2017 00:00	11-Oct-2017 00:00	11-Oct-2017 00:00	----
Compound	CAS Number	LOR	Unit		ES1725481-002	ES1725481-003	ES1725481-004	ES1725481-009	--------
					Result	Result	Result	Result	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		5.5	2.4	1.2	4.0	----
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		----	----	----	<5	----
Cadmium	7440-43-9	1	mg/kg		----	----	----	8	----
Chromium	7440-47-3	2	mg/kg		----	----	----	12	----
Copper	7440-50-8	5	mg/kg		----	----	----	870	----
Lead	7439-92-1	5	mg/kg		----	----	----	87	----
Nickel	7440-02-0	2	mg/kg		----	----	----	12	----
Zinc	7440-66-6	5	mg/kg		----	----	----	570	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		----	----	----	<0.1	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
4.4`-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	402-2	402-3	402-4	405-1A	----
				Client sampling date / time	11-Oct-2017 00:00	11-Oct-2017 00:00	11-Oct-2017 00:00	11-Oct-2017 00:00	----
Compound	CAS Number	LOR	Unit		ES1725481-002	ES1725481-003	ES1725481-004	ES1725481-009	--------
					Result	Result	Result	Result	----
EP068A: Organochlorine Pesticides (OC) - Continued									
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		----	----	----	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg		----	----	----	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg		----	----	----	<0.5	----
Fluorene	86-73-7	0.5	mg/kg		----	----	----	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg		----	----	----	<0.5	----
Anthracene	120-12-7	0.5	mg/kg		----	----	----	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg		----	----	----	<0.5	----
Pyrene	129-00-0	0.5	mg/kg		----	----	----	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		----	----	----	<0.5	----
Chrysene	218-01-9	0.5	mg/kg		----	----	----	<0.5	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		----	----	----	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		----	----	----	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		----	----	----	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		----	----	----	<0.5	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		----	----	----	<0.5	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		----	----	----	<0.5	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		----	----	----	<0.5	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		----	----	----	<0.5	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		----	----	----	**0.6**	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		----	----	----	**1.2**	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		----	----	----	<10	----
C10 - C14 Fraction	----	50	mg/kg		----	----	----	<50	----
C15 - C28 Fraction	----	100	mg/kg		----	----	----	<100	----
C29 - C36 Fraction	----	100	mg/kg		----	----	----	<100	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		----	----	----	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		----	----	----	<10	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		----	----	----	<10	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	402-2	402-3	402-4	405-1A	----
				Client sampling date / time	11-Oct-2017 00:00	11-Oct-2017 00:00	11-Oct-2017 00:00	11-Oct-2017 00:00	----
Compound	CAS Number	LOR	Unit		ES1725481-002	ES1725481-003	ES1725481-004	ES1725481-009	--------
					Result	Result	Result	Result	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>C10 - C16 Fraction	----	50	mg/kg		----	----	----	<50	----
>C16 - C34 Fraction	----	100	mg/kg		----	----	----	**150**	----
>C34 - C40 Fraction	----	100	mg/kg		----	----	----	<100	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		----	----	----	**150**	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		----	----	----	<50	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		----	----	----	<0.2	----
Toluene	108-88-3	0.5	mg/kg		----	----	----	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg		----	----	----	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		----	----	----	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg		----	----	----	<0.5	----
^ **Sum of BTEX**	----	0.2	mg/kg		----	----	----	<0.2	----
^ **Total Xylenes**	1330-20-7	0.5	mg/kg		----	----	----	<0.5	----
Naphthalene	91-20-3	1	mg/kg		----	----	----	<1	----
EP234A: OP Pesticides									
Azinphos-ethyl	2642-71-9	0.005	mg/kg		<0.005	<0.005	<0.005	----	----
Azinphos-methyl	86-50-0	0.005	mg/kg		<0.005	<0.005	<0.005	----	----
Chlorfenvinphos	470-90-6	0.005	mg/kg		<0.005	<0.005	<0.005	----	----
Coumaphos	56-72-4	0.002	mg/kg		<0.002	<0.002	<0.002	----	----
Diazinon	333-41-5	0.002	mg/kg		<0.002	<0.002	<0.002	----	----
Dimethoate	60-51-5	0.004	mg/kg		<0.004	<0.004	<0.004	----	----
Disulfoton	298-04-4	0.01	mg/kg		<0.01	<0.01	<0.01	----	----
Ethoprophos	13194-48-4	0.002	mg/kg		<0.002	<0.002	<0.002	----	----
Fenamiphos	22224-92-6	0.002	mg/kg		<0.002	<0.002	<0.002	----	----
Fenitrothion	122-14-5	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Fensulfothion	115-90-2	0.005	mg/kg		<0.005	<0.005	<0.005	----	----
Fenthion	55-38-9	0.010	mg/kg		<0.010	<0.010	<0.010	----	----
Malathion	121-75-5	0.005	mg/kg		<0.005	<0.005	<0.005	----	----
Mevinphos	7786-34-7	0.005	mg/kg		<0.005	<0.005	<0.005	----	----
Monocrotophos	6923-22-4	0.005	mg/kg		<0.005	<0.005	<0.005	----	----
Omethoate	1113-02-6	0.002	mg/kg		<0.002	<0.002	<0.002	----	----
Parathion	56-38-2	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Parathion-methyl	298-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	402-2	402-3	402-4	405-1A	----
			Client sampling date / time	11-Oct-2017 00:00	11-Oct-2017 00:00	11-Oct-2017 00:00	11-Oct-2017 00:00	----
Compound	CAS Number	LOR	Unit	ES1725481-002	ES1725481-003	ES1725481-004	ES1725481-009	--------
				Result	Result	Result	Result	----
EP234A: OP Pesticides - Continued								
Phorate	298-02-2	0.02	mg/kg	<0.02	<0.02	<0.02	----	----
Pirimiphos-methyl	29232-93-7	0.002	mg/kg	<0.002	<0.002	<0.002	----	----
Sulfotep	3689-24-5	0.001	mg/kg	<0.001	<0.001	<0.001	----	----
Tetrachlorvinphos	22248-79-9	0.002	mg/kg	<0.002	<0.002	<0.002	----	----
Triazophos	24017-47-8	0.001	mg/kg	<0.001	<0.001	<0.001	----	----
EP234B: Thiocarbamates and Carbamates								
Aldicarb	116-06-3	0.01	mg/kg	<0.01	<0.01	<0.01	----	----
Bendiocarb	22781-23-3	1	mg/kg	<1	<1	<1	----	----
Benomyl	17804-35-2	0.005	mg/kg	<0.005	<0.005	<0.005	----	----
Carbaryl	63-25-2	0.002	mg/kg	<0.002	<0.002	<0.002	----	----
Carbofuran	1563-66-2	0.002	mg/kg	<0.002	<0.002	<0.002	----	----
3-Hydroxy Carbofuran	16655-82-6	0.005	mg/kg	<0.005	<0.005	<0.005	----	----
Methiocarb	2032-65-7	0.002	mg/kg	<0.002	<0.002	<0.002	----	----
Methomyl	16752-77-5	0.002	mg/kg	<0.002	<0.002	<0.002	----	----
Molinate	2212-67-1	0.02	mg/kg	<0.02	<0.02	<0.02	----	----
Oxamyl	23135-22-0	0.002	mg/kg	<0.002	<0.002	<0.002	----	----
Thiobencarb	28249-77-6	0.002	mg/kg	<0.002	<0.002	<0.002	----	----
Thiodicarb	59669-26-0	0.002	mg/kg	<0.002	<0.002	<0.002	----	----
EP234D: Triazinone Herbicides								
Hexazinone	51235-04-2	0.004	mg/kg	<0.004	<0.004	<0.004	----	----
Metribuzin	21087-64-9	0.004	mg/kg	<0.004	<0.004	<0.004	----	----
EP234E: Conazole and Aminopyrimidine Fungicides								
Cyproconazole	94361-06-5	0.004	mg/kg	<0.004	<0.004	<0.004	----	----
Flusilazole	85509-19-9	0.004	mg/kg	<0.004	<0.004	<0.004	----	----
Hexaconazole	79983-71-4	0.004	mg/kg	<0.004	<0.004	<0.004	----	----
Paclobutrazole	76738-62-0	0.01	mg/kg	<0.01	<0.01	<0.01	----	----
Propiconazole	60207-90-1	0.01	mg/kg	<0.01	<0.01	<0.01	----	----
Tebuconazole	107534-96-3	0.002	mg/kg	<0.002	<0.002	<0.002	----	----
Cyprodinil	121552-61-2	0.002	mg/kg	<0.002	<0.002	<0.002	----	----
Pyrimethanil	53112-28-0	0.005	mg/kg	<0.005	<0.005	<0.005	----	----
EP234F: Phenylurea, Thizdiazolurea, Uracil and Sulfonylurea Herbicides								
Diuron	330-54-1	0.005	mg/kg	<0.005	<0.005	<0.005	----	----
Fluometuron	2164-17-2	0.002	mg/kg	<0.002	<0.002	<0.002	----	----
Tebuthiuron	34014-18-1	0.005	mg/kg	<0.005	<0.005	<0.005	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	402-2	402-3	402-4	405-1A	----
				Client sampling date / time	11-Oct-2017 00:00	11-Oct-2017 00:00	11-Oct-2017 00:00	11-Oct-2017 00:00	----
Compound	CAS Number	LOR	Unit		ES1725481-002	ES1725481-003	ES1725481-004	ES1725481-009	--------
					Result	Result	Result	Result	----
EP234F: Phenylurea, Thizdiazolurea, Uracil and Sulfonylurea Herbicides - Continued									
Bromacil	314-40-9	0.005	mg/kg		<0.005	<0.005	<0.005	----	----
EP234G: Chloracetanilides									
Metolachlor	51218-45-2	0.002	mg/kg		<0.002	<0.002	<0.002	----	----
EP234H: Triazine Herbicides									
Ametryn	834-12-8	0.002	mg/kg		<0.002	<0.002	<0.002	----	----
Atrazine	1912-24-9	0.002	mg/kg		<0.002	<0.002	<0.002	----	----
Cyanazine	21725-46-2	0.005	mg/kg		<0.005	<0.005	<0.005	----	----
Prometryn	7287-19-6	0.002	mg/kg		<0.002	<0.002	<0.002	----	----
Propazine	139-40-2	0.002	mg/kg		<0.002	<0.002	<0.002	----	----
Simazine	122-34-9	0.005	mg/kg		<0.005	<0.005	<0.005	----	----
Terbuthylazine	5915-41-3	0.002	mg/kg		<0.002	<0.002	<0.002	----	----
Terbutryn	886-50-0	0.1	mg/kg		<0.1	<0.1	<0.1	----	----
EP234I: Miscellaneous (ESI Positive Mode) Pesticides									
Fenarimol	60168-88-9	0.005	mg/kg		<0.005	<0.005	<0.005	----	----
Irgarol	28159-98-0	0.001	mg/kg		<0.001	<0.001	<0.001	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**83.5**	**97.7**	**122**	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**77.1**	**77.8**	**96.0**	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		----	----	----	**74.8**	----
2-Chlorophenol-D4	93951-73-6	0.5	%		----	----	----	**94.6**	----
2.4.6-Tribromophenol	118-79-6	0.5	%		----	----	----	**103**	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		----	----	----	**104**	----
Anthracene-d10	1719-06-8	0.5	%		----	----	----	**104**	----
4-Terphenyl-d14	1718-51-0	0.5	%		----	----	----	**107**	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		----	----	----	**98.3**	----
Toluene-D8	2037-26-5	0.2	%		----	----	----	**120**	----
4-Bromofluorobenzene	460-00-4	0.2	%		----	----	----	**116**	----

Analytical Results

Sub-Matrix: SOLID (Matrix: SOLID)				Client sample ID	402-1	402-5	404-1	404-2	404-3
				Client sampling date / time	11-Oct-2017 00:00	11-Oct-2017 00:00	11-Oct-2017 00:00	11-Oct-2017 00:00	11-Oct-2017 00:00
Compound	CAS Number	LOR	Unit		ES1725481-001	ES1725481-005	ES1725481-006	ES1725481-007	ES1725481-008
					Result	Result	Result	Result	Result
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples									
Asbestos Detected	1332-21-4	0.1	g/kg		**No**	**No**	**No**	**Yes**	**Yes**
Asbestos Type	1332-21-4	-	--		**-**	**-**	**-**	**Ch**	**Ch + Am**
Sample weight (dry)	----	0.01	g		**12.4**	**27.4**	**18.9**	**16.3**	**27.6**
APPROVED IDENTIFIER:	----	-	--		**G.MORGAN**	**G.MORGAN**	**G.MORGAN**	**G.MORGAN**	**G.MORGAN**

Analytical Results

Sub-Matrix: SOLID (Matrix: SOLID)				Client sample ID	405-1B	----	----	----	----
				Client sampling date / time	11-Oct-2017 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1725481-010	--------	--------	--------	--------	
				Result	----	----	----	----	
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples									
Asbestos Detected	1332-21-4	0.1	g/kg	**No**	**----**	**----**	**----**	**----**	
Asbestos Type	1332-21-4	-	--	**-**	**----**	**----**	**----**	**----**	
Sample weight (dry)	----	0.01	g	**18.0**	**----**	**----**	**----**	**----**	
APPROVED IDENTIFIER:	----	-	--	**G.MORGAN**	**----**	**----**	**----**	**----**	

Analytical Results

Descriptive Results

Sub-Matrix: **SOLID**

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples		
EA200: Description	402-1 - 11-Oct-2017 00:00	One piece of cement sheeting approximately 45 x 25 x 5mm.
EA200: Description	402-5 - 11-Oct-2017 00:00	One piece of cement sheeting approximately 70 x 40 x 5mm.
EA200: Description	404-1 - 11-Oct-2017 00:00	One piece of cement sheeting approximately 55 x 50 x 5mm.
EA200: Description	404-2 - 11-Oct-2017 00:00	One piece of asbestos cement sheeting approximately 60 x 40 x 5mm.
EA200: Description	404-3 - 11-Oct-2017 00:00	Three pieces of asbestos cement sheeting approximately 50 x 35 x 5mm.
EA200: Description	405-1B - 11-Oct-2017 00:00	Several pieces of cement sheeting approximately 50 x 40 x 4mm.

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

QUALITY CONTROL REPORT

Work Order	: **ES1725481**	Page	: 1 of 14
Client	: **ROBERT CARR & ASSOCIATES P/L**	Laboratory	: Environmental Division Sydney
Contact	: MR MATT CLARK	Contact	: Customer Services ES
Address	: P O BOX 175 CARRINGTON NSW, AUSTRALIA 2294	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 4902 9200	Telephone	: +61-2-8784 8555
Project	: HUNTLEE	Date Samples Received	: 12-Oct-2017
Order number	: 13148	Date Analysis Commenced	: 13-Oct-2017
C-O-C number	: ----	Issue Date	: 18-Oct-2017
Sampler	: MATT CLARK, NIC McLAUGHLIN		
Site	: ----		
Quote number	: SYBQ/265/16		
No. of samples received	: 10		
No. of samples analysed	: 10		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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*
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Gerrad Morgan	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, 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 (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 1173596)									
ES1725479-003	Anonymous	EA055: Moisture Content	----	1	%	10.9	13.2	18.6	0% - 50%
ES1725481-004	402-4	EA055: Moisture Content	----	1	%	1.2	1.2	0.00	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 1177627)									
ES1725346-021	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	25	27	10.4	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	4	4	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	8	7	17.6	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.00	No Limit
ES1725582-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	11	10	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	9	9	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	7	7	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	39	43	8.66	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	61	74	19.4	0% - 50%
		EG005T: Zinc	7440-66-6	5	mg/kg	146	171	16.2	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1177628)									
ES1725582-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1725588-006	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1172227)									
EW1704255-001	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit

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 (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1172227) - continued									
EW1704255-001	Anonymous	EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1172228)									
ES1725481-009	405-1A	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
EW1704255-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	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 (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1172228) - continued									
EW1704255-001	Anonymous	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
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1172229)									
ES1725481-009	405-1A	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
EW1704255-001	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
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1172231)									
ES1725551-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1725524-003	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1172229)									
ES1725481-009	405-1A	EP071: >C16 - C34 Fraction	----	100	mg/kg	150	140	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
EW1704255-001	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
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1172231)									
ES1725551-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1725524-003	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	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 (%)*
EP080: BTEXN (QC Lot: 1172231)									
ES1725551-001	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
		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
ES1725524-003	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
		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
EP234A: OP Pesticides (QC Lot: 1172010)									
ES1725481-002	402-2	EP234: Sulfotep	3689-24-5	0.001	mg/kg	<0.001	<0.001	0.00	No Limit
		EP234: Triazophos	24017-47-8	0.001	mg/kg	<0.001	<0.001	0.00	No Limit
		EP234: Coumaphos	56-72-4	0.002	mg/kg	<0.002	<0.002	0.00	No Limit
		EP234: Diazinon	333-41-5	0.002	mg/kg	<0.002	<0.002	0.00	No Limit
		EP234: Ethoprophos	13194-48-4	0.002	mg/kg	<0.002	<0.002	0.00	No Limit
		EP234: Fenamiphos	22224-92-6	0.002	mg/kg	<0.002	<0.002	0.00	No Limit
		EP234: Omethoate	1113-02-6	0.002	mg/kg	<0.002	<0.002	0.00	No Limit
		EP234: Pirimiphos-methyl	29232-93-7	0.002	mg/kg	<0.002	<0.002	0.00	No Limit
		EP234: Tetrachlorvinphos	22248-79-9	0.002	mg/kg	<0.002	<0.002	0.00	No Limit
		EP234: Dimethoate	60-51-5	0.004	mg/kg	<0.004	<0.004	0.00	No Limit
		EP234: Azinphos-ethyl	2642-71-9	0.005	mg/kg	<0.005	<0.005	0.00	No Limit
		EP234: Azinphos-methyl	86-50-0	0.005	mg/kg	<0.005	<0.005	0.00	No Limit
		EP234: Chlorfenvinphos	470-90-6	0.005	mg/kg	<0.005	<0.005	0.00	No Limit
		EP234: Fensulfothion	115-90-2	0.005	mg/kg	<0.005	<0.005	0.00	No Limit
		EP234: Malathion	121-75-5	0.005	mg/kg	<0.005	<0.005	0.00	No Limit
		EP234: Mevinphos	7786-34-7	0.005	mg/kg	<0.005	<0.005	0.00	No Limit
		EP234: Monocrotophos	6923-22-4	0.005	mg/kg	<0.005	<0.005	0.00	No Limit
		EP234: Disulfoton	298-04-4	0.01	mg/kg	<0.01	<0.01	0.00	No Limit
		EP234: Fenthion	55-38-9	0.01	mg/kg	<0.010	<0.010	0.00	No Limit
		EP234: Phorate	298-02-2	0.02	mg/kg	<0.02	<0.02	0.00	No Limit
		EP234: Parathion	56-38-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP234: Fenitrothion	122-14-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP234: Parathion-methyl	298-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP234B: Thiocarbamates and Carbamates (QC Lot: 1172010)									
ES1725481-002	402-2	EP234: Carbaryl	63-25-2	0.002	mg/kg	<0.002	<0.002	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 (%)*
EP234B: Thiocarbamates and Carbamates (QC Lot: 1172010) - continued									
ES1725481-002	402-2	EP234: Carbofuran	1563-66-2	0.002	mg/kg	<0.002	<0.002	0.00	No Limit
		EP234: Methiocarb	2032-65-7	0.002	mg/kg	<0.002	<0.002	0.00	No Limit
		EP234: Methomyl	16752-77-5	0.002	mg/kg	<0.002	<0.002	0.00	No Limit
		EP234: Oxamyl	23135-22-0	0.002	mg/kg	<0.002	<0.002	0.00	No Limit
		EP234: Thiobencarb	28249-77-6	0.002	mg/kg	<0.002	<0.002	0.00	No Limit
		EP234: Thiodicarb	59669-26-0	0.002	mg/kg	<0.002	<0.002	0.00	No Limit
		EP234: Benomyl	17804-35-2	0.005	mg/kg	<0.005	<0.005	0.00	No Limit
		EP234: 3-Hydroxy Carbofuran	16655-82-6	0.005	mg/kg	<0.005	<0.005	0.00	No Limit
		EP234: Aldicarb	116-06-3	0.01	mg/kg	<0.01	<0.01	0.00	No Limit
		EP234: Molinate	2212-67-1	0.02	mg/kg	<0.02	<0.02	0.00	No Limit
		EP234: Bendiocarb	22781-23-3	1	mg/kg	<1	<1	0.00	No Limit
EP234D: Triazinone Herbicides (QC Lot: 1172010)									
ES1725481-002	402-2	EP234: Hexazinone	51235-04-2	0.004	mg/kg	<0.004	<0.004	0.00	No Limit
		EP234: Metribuzin	21087-64-9	0.004	mg/kg	<0.004	<0.004	0.00	No Limit
EP234E: Conazole and Aminopyrimidine Fungicides (QC Lot: 1172010)									
ES1725481-002	402-2	EP234: Tebuconazole	107534-96-3	0.002	mg/kg	<0.002	<0.002	0.00	No Limit
		EP234: Cyprodinil	121552-61-2	0.002	mg/kg	<0.002	<0.002	0.00	No Limit
		EP234: Cyproconazole	94361-06-5	0.004	mg/kg	<0.004	<0.004	0.00	No Limit
		EP234: Flusilazole	85509-19-9	0.004	mg/kg	<0.004	<0.004	0.00	No Limit
		EP234: Hexaconazole	79983-71-4	0.004	mg/kg	<0.004	<0.004	0.00	No Limit
		EP234: Pyrimethanil	53112-28-0	0.005	mg/kg	<0.005	<0.005	0.00	No Limit
		EP234: Paclobutrazole	76738-62-0	0.01	mg/kg	<0.01	<0.01	0.00	No Limit
		EP234: Propiconazole	60207-90-1	0.01	mg/kg	<0.01	<0.01	0.00	No Limit
EP234F: Phenylurea, Thizdiazolurea, Uracil and Sulfonylurea Herbicides (QC Lot: 1172010)									
ES1725481-002	402-2	EP234: Fluometuron	2164-17-2	0.002	mg/kg	<0.002	<0.002	0.00	No Limit
		EP234: Diuron	330-54-1	0.005	mg/kg	<0.005	<0.005	0.00	No Limit
		EP234: Tebuthiuron	34014-18-1	0.005	mg/kg	<0.005	<0.005	0.00	No Limit
		EP234: Bromacil	314-40-9	0.005	mg/kg	<0.005	<0.005	0.00	No Limit
EP234G: Chloracetanilides (QC Lot: 1172010)									
ES1725481-002	402-2	EP234: Metolachlor	51218-45-2	0.002	mg/kg	<0.002	<0.002	0.00	No Limit
EP234H: Triazine Herbicides (QC Lot: 1172010)									
ES1725481-002	402-2	EP234: Ametryn	834-12-8	0.002	mg/kg	<0.002	<0.002	0.00	No Limit
		EP234: Atrazine	1912-24-9	0.002	mg/kg	<0.002	<0.002	0.00	No Limit
		EP234: Prometryn	7287-19-6	0.002	mg/kg	<0.002	<0.002	0.00	No Limit
		EP234: Propazine	139-40-2	0.002	mg/kg	<0.002	<0.002	0.00	No Limit
		EP234: Terbuthylazine	5915-41-3	0.002	mg/kg	<0.002	<0.002	0.00	No Limit
		EP234: Cyanazine	21725-46-2	0.005	mg/kg	<0.005	<0.005	0.00	No Limit
		EP234: Simazine	122-34-9	0.005	mg/kg	<0.005	<0.005	0.00	No Limit
		EP234: Terbutryn	886-50-0	0.1	mg/kg	<0.1	<0.1	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 (%)*
EP234I: Miscellaneous (ESI Positive Mode) Pesticides (QC Lot: 1172010)									
ES1725481-002	402-2	EP234: Irgarol	28159-98-0	0.001	mg/kg	<0.001	<0.001	0.00	No Limit
		EP234: Fenarimol	60168-88-9	0.005	mg/kg	<0.005	<0.005	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			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 1177627)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	96.5	86	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	93.8	83	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	84.8	76	128
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	92.9	80	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	95.0	87	123
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	95.5	80	122
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1177628)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	75.2	70	105
EP068A: Organochlorine Pesticides (OC) (QCLot: 1172227)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	91.5	69	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	85.5	65	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	80.0	67	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	81.7	68	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	95.5	65	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	84.0	67	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	93.3	69	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	86.7	62	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	90.3	63	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	77.0	66	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	91.0	64	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	93.6	66	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	81.5	67	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	88.9	67	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	86.3	69	115
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	92.5	69	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	84.8	56	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	101	62	124
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	87.2	66	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	96.7	64	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	85.0	54	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1172228)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	84.4	77	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	80.0	72	124

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1172228) - continued								
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	84.1	73	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	89.3	72	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	85.4	75	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	85.1	77	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	83.7	73	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	79.1	74	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	82.2	69	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	85.4	75	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	85.6	68	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	87.7	74	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	79.6	70	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	79.7	61	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	76.2	62	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	78.1	63	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1172229)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	99.8	75	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	105	77	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	104	71	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1172231)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	86.1	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1172229)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	107	77	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	105	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	150 mg/kg	97.6	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1172231)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	85.2	68	128
EP080: BTEXN (QCLot: 1172231)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	73.6	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	84.4	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	84.2	65	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	87.8	66	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	85.6	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	95.6	63	119
EP234A: OP Pesticides (QCLot: 1172010)								
EP234: Azinphos-ethyl	2642-71-9	0.005	mg/kg	<0.005	0.04 mg/kg	78.8	70	130
EP234: Azinphos-methyl	86-50-0	0.005	mg/kg	<0.005	0.04 mg/kg	102	60	118

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP234A: OP Pesticides (QCLot: 1172010) - continued								
EP234: Chlorfenvinphos	470-90-6	0.005	mg/kg	<0.005	0.08 mg/kg	71.4	61	111
EP234: Coumaphos	56-72-4	0.002	mg/kg	<0.002	0.02 mg/kg	80.8	65	101
EP234: Diazinon	333-41-5	0.002	mg/kg	<0.002	0.02 mg/kg	73.6	63	95
EP234: Dimethoate	60-51-5	0.004	mg/kg	<0.004	0.04 mg/kg	96.8	70	130
EP234: Disulfoton	298-04-4	0.01	mg/kg	<0.01	0.1 mg/kg	104	70	130
EP234: Ethoprophos	13194-48-4	0.002	mg/kg	<0.002	0.02 mg/kg	92.0	70	130
EP234: Fenamiphos	22224-92-6	0.002	mg/kg	<0.002	0.02 mg/kg	88.0	70	130
EP234: Fenitrothion	122-14-5	0.5	mg/kg	<0.5	4 mg/kg	80.4	70	130
EP234: Fensulfothion	115-90-2	0.005	mg/kg	<0.005	0.02 mg/kg	92.8	62	116
EP234: Fenthion	55-38-9	0.01	mg/kg	<0.010	0.1 mg/kg	71.5	70	130
EP234: Malathion	121-75-5	0.005	mg/kg	<0.005	0.04 mg/kg	74.4	70	130
EP234: Mevinphos	7786-34-7	0.005	mg/kg	<0.005	0.08 mg/kg	93.2	67	123
EP234: Monocrotophos	6923-22-4	0.005	mg/kg	<0.005	0.04 mg/kg	105	61	117
EP234: Omethoate	1113-02-6	0.002	mg/kg	<0.002	0.02 mg/kg	70.4	70	130
EP234: Parathion	56-38-2	0.05	mg/kg	<0.05	0.4 mg/kg	82.0	70	130
EP234: Parathion-methyl	298-00-0	0.5	mg/kg	<0.5	4 mg/kg	85.9	62	118
EP234: Phorate	298-02-2	0.02	mg/kg	<0.02	0.2 mg/kg	77.0	70	130
EP234: Pirimiphos-methyl	29232-93-7	0.002	mg/kg	<0.002	0.02 mg/kg	75.2	63	103
EP234: Sulfotep	3689-24-5	0.001	mg/kg	<0.001	0.01 mg/kg	73.6	59	111
EP234: Tetrachlorvinphos	22248-79-9	0.002	mg/kg	<0.002	0.02 mg/kg	77.6	60	106
EP234: Triazophos	24017-47-8	0.001	mg/kg	<0.001	0.01 mg/kg	78.4	63	107
EP234B: Thiocarbamates and Carbamates (QCLot: 1172010)								
EP234: Aldicarb	116-06-3	0.01	mg/kg	<0.01	0.1 mg/kg	110	67	117
EP234: Bendiocarb	22781-23-3	1	mg/kg	<1	0.2 mg/kg	70.2	70	130
EP234: Benomyl	17804-35-2	0.005	mg/kg	<0.005	0.02 mg/kg	94.4	56	122
EP234: Carbaryl	63-25-2	0.002	mg/kg	<0.002	0.02 mg/kg	73.6	70	130
EP234: Carbofuran	1563-66-2	0.002	mg/kg	<0.002	0.02 mg/kg	85.6	70	130
EP234: 3-Hydroxy Carbofuran	16655-82-6	0.005	mg/kg	<0.005	0.04 mg/kg	74.4	70	130
EP234: Methiocarb	2032-65-7	0.002	mg/kg	<0.002	0.02 mg/kg	72.0	70	130
EP234: Methomyl	16752-77-5	0.002	mg/kg	<0.002	0.02 mg/kg	100	70	130
EP234: Molinate	2212-67-1	0.02	mg/kg	<0.02	0.2 mg/kg	87.8	70	130
EP234: Oxamyl	23135-22-0	0.002	mg/kg	<0.002	0.02 mg/kg	73.6	70	130
EP234: Thiobencarb	28249-77-6	0.002	mg/kg	<0.002	0.02 mg/kg	79.2	59	109
EP234: Thiodicarb	59669-26-0	0.002	mg/kg	<0.002	0.02 mg/kg	77.6	70	130
EP234D: Triazinone Herbicides (QCLot: 1172010)								
EP234: Hexazinone	51235-04-2	0.004	mg/kg	<0.004	0.04 mg/kg	100	62	124
EP234: Metribuzin	21087-64-9	0.004	mg/kg	<0.004	0.04 mg/kg	85.2	65	119
EP234E: Conazole and Aminopyrimidine Fungicides (QCLot: 1172010)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP234E: Conazole and Aminopyrimidine Fungicides (QCLot: 1172010) - continued								
EP234: Cyproconazole	94361-06-5	0.004	mg/kg	<0.004	0.08 mg/kg	96.2	70	130
EP234: Flusilazole	85509-19-9	0.004	mg/kg	<0.004	0.04 mg/kg	84.0	59	107
EP234: Hexaconazole	79983-71-4	0.004	mg/kg	<0.004	0.04 mg/kg	75.6	62	106
EP234: Paclobutrazole	76738-62-0	0.01	mg/kg	<0.01	0.1 mg/kg	98.4	70	130
EP234: Propiconazole	60207-90-1	0.01	mg/kg	<0.01	0.1 mg/kg	93.8	60	102
EP234: Tebuconazole	107534-96-3	0.002	mg/kg	<0.002	0.02 mg/kg	90.4	70	130
EP234: Cyprodinil	121552-61-2	0.002	mg/kg	<0.002	0.02 mg/kg	84.0	62	98
EP234: Pyrimethanil	53112-28-0	0.005	mg/kg	<0.005	0.04 mg/kg	94.0	61	127
EP234F: Phenylurea, Thizdiazolurea, Uracil and Sulfonylurea Herbicides (QCLot: 1172010)								
EP234: Diuron	330-54-1	0.005	mg/kg	<0.005	0.04 mg/kg	108	70	130
EP234: Fluometuron	2164-17-2	0.002	mg/kg	<0.002	0.02 mg/kg	96.0	64	122
EP234: Tebuthiuron	34014-18-1	0.005	mg/kg	<0.005	0.04 mg/kg	104	58	108
EP234: Bromacil	314-40-9	0.005	mg/kg	<0.005	0.04 mg/kg	88.4	61	131
EP234G: Chloracetanilides (QCLot: 1172010)								
EP234: Metolachlor	51218-45-2	0.002	mg/kg	<0.002	0.02 mg/kg	95.2	70	130
EP234H: Triazine Herbicides (QCLot: 1172010)								
EP234: Ametryn	834-12-8	0.002	mg/kg	<0.002	0.02 mg/kg	94.4	70	130
EP234: Atrazine	1912-24-9	0.002	mg/kg	<0.002	0.02 mg/kg	92.8	62	120
EP234: Cyanazine	21725-46-2	0.005	mg/kg	<0.005	0.04 mg/kg	95.2	70	130
EP234: Prometryn	7287-19-6	0.002	mg/kg	<0.002	0.02 mg/kg	90.4	58	130
EP234: Propazine	139-40-2	0.002	mg/kg	<0.002	0.02 mg/kg	94.4	61	127
EP234: Simazine	122-34-9	0.005	mg/kg	<0.005	0.04 mg/kg	100	70	130
EP234: Terbuthylazine	5915-41-3	0.002	mg/kg	<0.002	0.02 mg/kg	92.0	63	117
EP234: Terbutryn	886-50-0	0.1	mg/kg	<0.1	0.02 mg/kg	77.6	59	115
EP234I: Miscellaneous (ESI Positive Mode) Pesticides (QCLot: 1172010)								
EP234: Fenarimol	60168-88-9	0.005	mg/kg	<0.005	0.04 mg/kg	87.2	62	114
EP234: Irgarol	28159-98-0	0.001	mg/kg	<0.001	0.004 mg/kg	84.0	60	112

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	SpikeRecovery(%)	Recovery Limits (%)	
				Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 1177627)							
ES1725582-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	92.9	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	95.7	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
EG005T: Total Metals by ICP-AES (QCLot: 1177627) - continued							
ES1725582-001	Anonymous	EG005T: Chromium	7440-47-3	50 mg/kg	94.3	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	99.2	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	102	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	96.8	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	110	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1177628)							
ES1725582-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	90.1	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 1172227)							
EW1704255-001	Anonymous	EP068: gamma-BHC	58-89-9	0.5 mg/kg	97.0	70	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	94.4	70	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	101	70	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	97.8	70	130
		EP068: Endrin	72-20-8	2 mg/kg	89.1	70	130
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	88.1	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1172228)							
EW1704255-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	89.3	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	82.5	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1172229)							
EW1704255-001	Anonymous	EP071: C10 - C14 Fraction	----	523 mg/kg	78.4	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	122	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	122	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1172231)							
ES1725524-003	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	101	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1172229)							
EW1704255-001	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	88.4	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	118	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	111	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1172231)							
ES1725524-003	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	100	70	130
EP080: BTEXN (QCLot: 1172231)							
ES1725524-003	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	78.9	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	94.7	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	94.7	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	95.3	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	95.5	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
EP080: BTEXN (QCLot: 1172231) - continued							
ES1725524-003	Anonymous	EP080: Naphthalene	91-20-3	2.5 mg/kg	86.6	70	130
EP234A: OP Pesticides (QCLot: 1172010)							
ES1725481-002	402-2	EP234: Azinphos-ethyl	2642-71-9	0.04 mg/kg	104	70	130
		EP234: Azinphos-methyl	86-50-0	0.04 mg/kg	122	70	130
		EP234: Chlorfenvinphos	470-90-6	0.08 mg/kg	96.8	70	130
		EP234: Coumaphos	56-72-4	0.02 mg/kg	103	70	130
		EP234: Diazinon	333-41-5	0.02 mg/kg	90.4	70	130
		EP234: Dimethoate	60-51-5	0.04 mg/kg	94.8	70	130
		EP234: Disulfoton	298-04-4	0.1 mg/kg	79.7	70	130
		EP234: Ethoprophos	13194-48-4	0.02 mg/kg	99.2	70	130
		EP234: Fenamiphos	22224-92-6	0.02 mg/kg	99.2	70	130
		EP234: Fenitrothion	122-14-5	4 mg/kg	90.1	70	130
		EP234: Fensulfothion	115-90-2	0.02 mg/kg	88.8	70	130
		EP234: Fenthion	55-38-9	0.1 mg/kg	93.9	70	130
		EP234: Malathion	121-75-5	0.04 mg/kg	91.2	70	130
		EP234: Mevinphos	7786-34-7	0.08 mg/kg	103	70	130
		EP234: Monocrotophos	6923-22-4	0.04 mg/kg	108	70	130
		EP234: Omethoate	1113-02-6	0.02 mg/kg	100	70	130
		EP234: Parathion	56-38-2	0.4 mg/kg	97.2	70	130
		EP234: Parathion-methyl	298-00-0	4 mg/kg	100	70	130
		EP234: Phorate	298-02-2	0.2 mg/kg	93.9	70	130
		EP234: Pirimiphos-methyl	29232-93-7	0.02 mg/kg	95.2	70	130
		EP234: Sulfotep	3689-24-5	0.01 mg/kg	110	70	130
		EP234: Tetrachlorvinphos	22248-79-9	0.02 mg/kg	114	70	130
		EP234: Triazophos	24017-47-8	0.01 mg/kg	109	70	130
EP234B: Thiocarbamates and Carbamates (QCLot: 1172010)							
ES1725481-002	402-2	EP234: Aldicarb	116-06-3	0.1 mg/kg	90.7	70	130
		EP234: Bendiocarb	22781-23-3	0.2 mg/kg	82.0	70	130
		EP234: Benomyl	17804-35-2	0.02 mg/kg	100	70	130
		EP234: Carbaryl	63-25-2	0.02 mg/kg	88.8	70	130
		EP234: Carbofuran	1563-66-2	0.02 mg/kg	89.6	70	130
		EP234: 3-Hydroxy Carbofuran	16655-82-6	0.04 mg/kg	92.0	70	130
		EP234: Methiocarb	2032-65-7	0.02 mg/kg	84.0	70	130
		EP234: Methomyl	16752-77-5	0.02 mg/kg	102	70	130
		EP234: Molinate	2212-67-1	0.2 mg/kg	99.2	70	130
		EP234: Oxamyl	23135-22-0	0.02 mg/kg	94.4	70	130
		EP234: Thiobencarb	28249-77-6	0.02 mg/kg	104	70	130
		EP234: Thiodicarb	59669-26-0	0.02 mg/kg	110	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*
EP234D: Triazinone Herbicides (QCLot: 1172010)							
ES1725481-002	402-2	EP234: Hexazinone	51235-04-2	0.04 mg/kg	102	70	130
		EP234: Metribuzin	21087-64-9	0.04 mg/kg	106	70	130
EP234E: Conazole and Aminopyrimidine Fungicides (QCLot: 1172010)							
ES1725481-002	402-2	EP234: Cyproconazole	94361-06-5	0.08 mg/kg	103	70	130
		EP234: Flusilazole	85509-19-9	0.04 mg/kg	96.0	70	130
		EP234: Hexaconazole	79983-71-4	0.04 mg/kg	89.2	70	130
		EP234: Paclobutrazole	76738-62-0	0.1 mg/kg	101	70	130
		EP234: Propiconazole	60207-90-1	0.1 mg/kg	107	70	130
		EP234: Tebuconazole	107534-96-3	0.02 mg/kg	101	70	130
		EP234: Cyprodinil	121552-61-2	0.02 mg/kg	99.2	70	130
		EP234: Pyrimethanil	53112-28-0	0.04 mg/kg	100	70	130
EP234F: Phenylurea, Thizdiazolurea, Uracil and Sulfonylurea Herbicides (QCLot: 1172010)							
ES1725481-002	402-2	EP234: Diuron	330-54-1	0.04 mg/kg	103	70	130
		EP234: Fluometuron	2164-17-2	0.02 mg/kg	96.8	70	130
		EP234: Tebuthiuron	34014-18-1	0.04 mg/kg	101	70	130
		EP234: Bromacil	314-40-9	0.04 mg/kg	95.6	70	130
EP234G: Chloracetanilides (QCLot: 1172010)							
ES1725481-002	402-2	EP234: Metolachlor	51218-45-2	0.02 mg/kg	102	70	130
EP234H: Triazine Herbicides (QCLot: 1172010)							
ES1725481-002	402-2	EP234: Ametryn	834-12-8	0.02 mg/kg	120	70	130
		EP234: Atrazine	1912-24-9	0.02 mg/kg	118	70	130
		EP234: Cyanazine	21725-46-2	0.04 mg/kg	102	70	130
		EP234: Prometryn	7287-19-6	0.02 mg/kg	99.2	70	130
		EP234: Propazine	139-40-2	0.02 mg/kg	103	70	130
		EP234: Simazine	122-34-9	0.04 mg/kg	104	70	130
		EP234: Terbuthylazine	5915-41-3	0.02 mg/kg	99.2	70	130
		EP234: Terbutryn	886-50-0	0.02 mg/kg	86.4	70	130
EP234I: Miscellaneous (ESI Positive Mode) Pesticides (QCLot: 1172010)							
ES1725481-002	402-2	EP234: Fenarimol	60168-88-9	0.04 mg/kg	109	70	130
		EP234: Irgarol	28159-98-0	0.004 mg/kg	100	70	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1725481**	Page	: 1 of 6
Client	: **ROBERT CARR & ASSOCIATES P/L**	Laboratory	: Environmental Division Sydney
Contact	: MR MATT CLARK	Telephone	: +61-2-8784 8555
Project	: HUNTLEE	Date Samples Received	: 12-Oct-2017
Site	: ----	Issue Date	: 18-Oct-2017
Sampler	: MATT CLARK, NIC McLAUGHLIN	No. of samples received	: 10
Order number	: 13148	No. of samples analysed	: 10

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

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **SOIL**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Pesticides by GCMS	1	11	9.09	10.00	NEPM 2013 B3 & ALS QC Standard

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
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055)							
402-2, 402-3, 402-4, 405-1A	**11-Oct-2017**	**----**	----	----	**13-Oct-2017**	25-Oct-2017	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
405-1A	**11-Oct-2017**	**16-Oct-2017**	09-Apr-2018	✓	**16-Oct-2017**	09-Apr-2018	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
405-1A	**11-Oct-2017**	**16-Oct-2017**	08-Nov-2017	✓	**17-Oct-2017**	08-Nov-2017	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068)							
402-2, 402-3, 402-4	**11-Oct-2017**	**13-Oct-2017**	25-Oct-2017	✓	**15-Oct-2017**	22-Nov-2017	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
405-1A	**11-Oct-2017**	**13-Oct-2017**	25-Oct-2017	✓	**15-Oct-2017**	22-Nov-2017	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
405-1A	**11-Oct-2017**	**13-Oct-2017**	25-Oct-2017	✓	**13-Oct-2017**	25-Oct-2017	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080)							
405-1A	**11-Oct-2017**	**13-Oct-2017**	25-Oct-2017	✓	**13-Oct-2017**	25-Oct-2017	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
405-1A	**11-Oct-2017**	**13-Oct-2017**	25-Oct-2017	✓	**13-Oct-2017**	25-Oct-2017	✓

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
EP234A: OP Pesticides							
Soil Glass Jar - Unpreserved (EP234)							
402-2, 402-3, 402-4	**11-Oct-2017**	**13-Oct-2017**	25-Oct-2017	✓	**13-Oct-2017**	22-Nov-2017	✓
EP234B: Thiocarbamates and Carbamates							
Soil Glass Jar - Unpreserved (EP234)							
402-2, 402-3, 402-4	**11-Oct-2017**	**13-Oct-2017**	25-Oct-2017	✓	**13-Oct-2017**	22-Nov-2017	✓
EP234D: Triazinone Herbicides							
Soil Glass Jar - Unpreserved (EP234)							
402-2, 402-3, 402-4	**11-Oct-2017**	**13-Oct-2017**	25-Oct-2017	✓	**13-Oct-2017**	22-Nov-2017	✓
EP234E: Conazole and Aminopyrimidine Fungicides							
Soil Glass Jar - Unpreserved (EP234)							
402-2, 402-3, 402-4	**11-Oct-2017**	**13-Oct-2017**	25-Oct-2017	✓	**13-Oct-2017**	22-Nov-2017	✓
EP234F: Phenylurea, Thizdiazolurea, Uracil and Sulfonylurea Herbicides							
Soil Glass Jar - Unpreserved (EP234)							
402-2, 402-3, 402-4	**11-Oct-2017**	**13-Oct-2017**	25-Oct-2017	✓	**13-Oct-2017**	22-Nov-2017	✓
EP234G: Chloracetanilides							
Soil Glass Jar - Unpreserved (EP234)							
402-2, 402-3, 402-4	**11-Oct-2017**	**13-Oct-2017**	25-Oct-2017	✓	**13-Oct-2017**	22-Nov-2017	✓
EP234H: Triazine Herbicides							
Soil Glass Jar - Unpreserved (EP234)							
402-2, 402-3, 402-4	**11-Oct-2017**	**13-Oct-2017**	25-Oct-2017	✓	**13-Oct-2017**	22-Nov-2017	✓
EP234I: Miscellaneous (ESI Positive Mode) Pesticides							
Soil Glass Jar - Unpreserved (EP234)							
402-2, 402-3, 402-4	**11-Oct-2017**	**13-Oct-2017**	25-Oct-2017	✓	**13-Oct-2017**	22-Nov-2017	✓

Matrix: **SOLID**

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
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples							
Soil Glass Jar - Unpreserved (EA200)							
402-1, 402-5, 404-1, 404-2, 404-3, 405-1B	**11-Oct-2017**	**----**	----	----	**17-Oct-2017**	09-Apr-2018	✓

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*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	11	**9.09**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Pesticides by LCMSMS (Positive Ion Mode)	EP234	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	**10.00**	**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	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by LCMSMS (Positive Ion Mode)	EP234	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**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	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by LCMSMS (Positive Ion Mode)	EP234	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**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	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by LCMSMS (Positive Ion Mode)	EP234	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**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	14	**7.14**	**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).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 504,505)
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.
Pesticides by LCMSMS (Positive Ion Mode)	EP234	SOIL	In house: LC-MSMS, direct injection. A sample extracted into acetonitrile, diluted with water and injected directly onto the instrument.. Analysis is by LC/MSMS, ESI Positive Mode.
Asbestos Identification in Bulk Solids	EA200	SOLID	In house: Referenced to AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Sample preparation for Pesticides by LCMSMS	EP234-PR	SOIL	In house
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.

Preparation Methods	Method	Matrix	Method Descriptions
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.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES1725481**

Client	: **ROBERT CARR & ASSOCIATES P/L**	Laboratory	: Environmental Division Sydney
Contact	: MR MATT CLARK	Contact	: Customer Services ES
Address	: P O BOX 175 CARRINGTON NSW, AUSTRALIA 2294	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: mattc@rca.com.au	E-mail	: ALSEnviro.Sydney@alsglobal.com
Telephone	: +61 02 4902 9200	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 4902 9299	Facsimile	: +61-2-8784 8500
Project	: HUNTLEE	Page	: 1 of 3
Order number	: 13148	Quote number	: ES2016ROBCAR0002 (SYBQ/265/16)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: MATT CLARK, NIC McLAUGHLIN		

Dates

Date Samples Received	: 12-Oct-2017 12:28	Issue Date	: 12-Oct-2017
Client Requested Due Date	: 19-Oct-2017	Scheduled Reporting Date	: **19-Oct-2017**

Delivery Details

Mode of Delivery	: Undefined	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: ----
Receipt Detail	:	No. of samples received / analysed	: 10 / 10

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Asbestos analysis will be conducted by ALS Newcastle.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

Method Client sample ID	Sample Container Received	Preferred Sample Container for Analysis
Asbestos Identification in Bulk Solids : EA200		
402-1	- Soil Glass Jar - Unpreserved	- Snap Lock Bag
402-5	- Soil Glass Jar - Unpreserved	- Snap Lock Bag
404-1	- Soil Glass Jar - Unpreserved	- Snap Lock Bag
404-2	- Soil Glass Jar - Unpreserved	- Snap Lock Bag
404-3	- Soil Glass Jar - Unpreserved	- Snap Lock Bag
405-1B	- Soil Glass Jar - Unpreserved	- Snap Lock Bag

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP068A (solids) Organochlorine Pesticides by GCMS	SOIL - EP234 Pesticide by LCMSMS (Positive Ion Mode)	SOIL - S-26 8 metals/TRH/BTEXN/PAH
ES1725481-002	11-Oct-2017 00:00	402-2	✓	✓	✓	
ES1725481-003	11-Oct-2017 00:00	402-3	✓	✓	✓	
ES1725481-004	11-Oct-2017 00:00	402-4	✓	✓	✓	
ES1725481-009	11-Oct-2017 00:00	405-1A	✓			✓

Matrix: **SOLID**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOLID - EA200B Asbestos Identification in Bulk Solids (Excluding
ES1725481-001	11-Oct-2017 00:00	402-1	✓
ES1725481-005	11-Oct-2017 00:00	402-5	✓
ES1725481-006	11-Oct-2017 00:00	404-1	✓
ES1725481-007	11-Oct-2017 00:00	404-2	✓
ES1725481-008	11-Oct-2017 00:00	404-3	✓
ES1725481-010	11-Oct-2017 00:00	405-1B	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ALL INVOICES

- A4 - AU Tax Invoice (INV)	Email	administrator@rca.com.au

MATT CLARK

- *AU Certificate of Analysis - NATA (COA)	Email	mattc@rca.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	mattc@rca.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	mattc@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	mattc@rca.com.au
- Chain of Custody (CoC) (COC)	Email	mattc@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	mattc@rca.com.au
- EDI Format - XTab (XTAB)	Email	mattc@rca.com.au

NIC McLAUGHLIN

- *AU Certificate of Analysis - NATA (COA)	Email	nicm@rca.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	nicm@rca.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	nicm@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	nicm@rca.com.au
- Chain of Custody (CoC) (COC)	Email	nicm@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	nicm@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	nicm@rca.com.au
- EDI Format - XTab (XTAB)	Email	nicm@rca.com.au

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0690 E: adelaide@alsglobal.com
☐BRISBANE 32 Shand 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
☐MUDGEE 27 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
☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com
☐PERTH 10 Hod 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 4796 0600 E: townsville.environmental@alsglobal.com
☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: RCA Australia	TURNAROUND REQUIREMENTS: ☑ Standard TAT (List due date): 19/10/17	FOR LABORATORY USE ONLY (Circle)	
OFFICE: Carrington	(Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact?	Yes / No / N/A
PROJECT: Huntlee	ALS QUOTE NO.: SYBQ-265-16	Free ice / frozen ice bricks present upon receipt?	Yes / No / N/A
ORDER NUMBER: 13148	COC SEQUENCE NUMBER (Circle) COC: (1) 2 3 4 5 6 7	Random Sample Temperature on Receipt:	°C
PROJECT MANAGER: Matt Clark	CONTACT PH: 0438 576 324 OF: (1) 2 3 4 5 6 7	Other comment:	
SAMPLER: Matt Clark/Nic McLaughlin	SAMPLER MOBILE:	RELINQUISHED BY: Matt Clark	RECEIVED BY: KPalls
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	DATE/TIME: 12/10/17	DATE/TIME: 12-10-17 12.29pm
Email Reports to: mattc@rca.com.au,nicm@rca.com.au		RELINQUISHED BY:	RECEIVED BY: (Original)
Email Invoice to (will default to PM if no other addresses are listed): admin@rca.com.au		DATE/TIME:	DATE/TIME: 12-10-17 7:30pm

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	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 CONTAINERS	Asbestos	OCP	Herbicides EP234	S-26					Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	402-1	11-10-17	Bulk	Soil Jar	1	X								
2	402-2		S				X	X						
3	402-3		S				X	X						
4	402-4		S				X	X						
5	402-5		B			X								
6	404-1		B			X								
7	404-2		B			X								
8	404-3		B			X								
9	405-1a		S						X					
10	405-1b		B			X								
						LAB OF ORIGIN: NEWCASTLE								
					TOTAL									

E-MAILED

Environmental Division Sydney
Work Order Reference
ES1725481

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.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EN1704392**	Page	: 1 of 3
Client	: **ROBERT CARR & ASSOCIATES P/L**	Laboratory	: Environmental Division Newcastle
Contact	: MR MATT CLARK	Contact	:
Address	: P O BOX 175 CARRINGTON NSW, AUSTRALIA 2294	Address	: 5/585 Maitland Road Mayfield West NSW Australia 2304
Telephone	: +61 02 4902 9200	Telephone	: +61 2 4014 2500
Project	: ----	Date Samples Received	: 24-Oct-2017 14:25
Order number	: ----	Date Analysis Commenced	: 26-Oct-2017
C-O-C number	: ----	Issue Date	: 27-Oct-2017 14:02
Sampler	: MATT CLARK, NIC McLAUGHLIN		
Site	: ----		
Quote number	: SYBQ/400/17		
No. of samples received	: 4		
No. of samples analysed	: 4		

ilac-MRA NATA

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Gerrad Morgan	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, 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.

- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Ch' Chrysotile (white asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.

Analytical Results

Sub-Matrix: SOLID (Matrix: SOLID)			Client sample ID	403-2	404-4	403-1	403-3	----
			Client sampling date / time	24-Oct-2017 00:00	24-Oct-2017 00:00	24-Oct-2017 00:00	24-Oct-2017 00:00	----
Compound	CAS Number	LOR	Unit	EN1704392-001	EN1704392-002	EN1704392-003	EN1704392-004	--------
				Result	Result	Result	Result	----
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples								
Asbestos Detected	1332-21-4	0.1	g/kg	**Yes**	**No**	**No**	**No**	**----**
Asbestos Type	1332-21-4	-	--	**Ch**	**-**	**-**	**-**	**----**
Sample weight (dry)	----	0.01	g	**14.3**	**8.13**	**24.0**	**19.0**	**----**
APPROVED IDENTIFIER:	----	-	--	**G.MORGAN**	**G.MORGAN**	**G.MORGAN**	**G.MORGAN**	**----**

Analytical Results

Descriptive Results

Sub-Matrix: **SOLID**

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples		
EA200: Description	403-2 - 24-Oct-2017 00:00	One piece of asbestos cement sheeting approximately 65 x 35 x 4mm.
EA200: Description	404-4 - 24-Oct-2017 00:00	One piece of cement sheeting approximately 30 x 25 x 4mm.
EA200: Description	403-1 - 24-Oct-2017 00:00	One piece of cement sheeting approximately 35 x 30 x 15mm.
EA200: Description	403-3 - 24-Oct-2017 00:00	One piece of cement sheeting approximately 60 x 50 x 4mm.

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EN1704392**	Page	: 1 of 3
Client	: **ROBERT CARR & ASSOCIATES P/L**	Laboratory	: Environmental Division Newcastle
Contact	: MR MATT CLARK	Contact	:
Address	: P O BOX 175 CARRINGTON NSW, AUSTRALIA 2294	Address	: 5/585 Maitland Road Mayfield West NSW Australia 2304
Telephone	: +61 02 4902 9200	Telephone	: +61 2 4014 2500
Project	: ----	Date Samples Received	: 24-Oct-2017
Order number	: ----	Date Analysis Commenced	: 26-Oct-2017
C-O-C number	: ----	Issue Date	: 27-Oct-2017
Sampler	: MATT CLARK, NIC McLAUGHLIN		
Site	: ----		
Quote number	: SYBQ/400/17		
No. of samples received	: 4		
No. of samples analysed	: 4		

ilac-MRA NATA

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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*
Gerrad Morgan	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, 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%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**

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.

- **No Method Blank (MB) or Laboratory Control Spike (LCS) Results are required to be reported.**

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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EN1704392**	Page	: 1 of 4
Client	: **ROBERT CARR & ASSOCIATES P/L**	Laboratory	: Environmental Division Newcastle
Contact	: MR MATT CLARK	Telephone	: +61 2 4014 2500
Project	: ----	Date Samples Received	: 24-Oct-2017
Site	: ----	Issue Date	: 27-Oct-2017
Sampler	: MATT CLARK, NIC McLAUGHLIN	No. of samples received	: 4
Order number	: ----	No. of samples analysed	: 4

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: **SOLID**

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
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples							
Soil Glass Jar - Unpreserved (EA200)							
403-2, 404-4, 403-1, 403-3	**24-Oct-2017**	**----**	----	----	**26-Oct-2017**	22-Apr-2018	✓

Quality Control Parameter Frequency Compliance

- **No Quality Control data available for this section.**

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
Asbestos Identification in Bulk Solids	EA200	SOLID	In house: Referenced to AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0690 E: adelaide@alsglobal.com

☐BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5699 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

☐MUDGEE 27 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

☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com

☐PERTH 10 Hod 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 4796 0600 E: townsville.environmental@alsglobal.com

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

CLIENT: RCA Australia	**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): 3 day 27/10/17
OFFICE: Carrington	**ALS QUOTE NO.:** EN/222/17
PROJECT: Huntlee	
ORDER NUMBER: 13148	**COC SEQUENCE NUMBER (Circle)** COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7
PROJECT MANAGER: Matt Clark	**CONTACT PH:** 0438 576 324
SAMPLER: Matt Clark/Nic McLaughlin	**SAMPLER MOBILE:** 0438576324
COC emailed to ALS? (YES / NO)	**EDD FORMAT (or default):**
Email Reports to: matto@rca.com.au,nicm@rca.com.au	
Email Invoice to (will default to PM if no other addresses are listed): admin@rca.com.au	

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:			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Matt Clark	DB		
DATE/TIME: 24/10/17	DATE/TIME: 24/10/17 2:25pm	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	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 CONTAINERS	Asbestos Presence/Absence	
1	403-2	24/10/17	Bulk	Soil Jar	1	X	
2	403-4	↓	↓	↓	↓	X	
3	403-1					X	
4	403-3					X	
				TOTAL			

TAT

Environmental Division
Newcastle
Work Order Reference
EN1704392

Telephone : +61 2 4014 2500

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.

Appendix G

Summary of Results

Sample Identification	403-1	403-2	403-3	404-1	404-2	404-3	404-4
Sample Depth (m) [B]	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Date	23.10.17	23.10.17	23.10.17	11.10.17	11.10.17	11.10.17	23.10.17
Sample Profile	Fibrous cement sheet fragment	Fibrous cement sheet fragment	Fibrous cement sheet fragment	Fibrous cement sheet fragment	Fibrous cement sheet fragment	Fibrous cement sheet fragment	Fibrous cement sheet fragment
Sample Purpose	Investigation	Investigation	Investigation	Investigation	Investigation	Investigation	Investigation
Sample collected by	RCA - MC/NM	RCA - MC/NM	RCA - MC/NM	RCA - MC/NM	RCA - MC/NM	RCA - MC/NM	RCA - MC/NM
Asbestos							
Detected Asbestos Weight Sample weight	Nil detected 24.0g	Chrysotile asbestos detected 14.3g	Nil detected 19.0g	Nil detected 18.9g	Chrysotile asbestos detected 16.3g	Chrysotile and amosite asbestos detected 27.6g	Nil detected 8.13g