Appendix N
Preliminary Site Contamination Investigation

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Glossary of Terms

Bund	An impervious embankment of earth or a brick wall, which may form part or all of the perimeter of a compound that is provided to retain liquid.
Chainage	The chainage at a location along a rail line is the distance of that point in relation to Sydney (NSW only) based on 0.000 kilometres being located at the end of Central No. 1 Platform.
Consent	Approval to undertake a development received from the consent authority.
Construction Environmental Management Plan	A document setting out the management, control and monitoring measures to be implemented during construction of a development, to avoid or minimise the potential environmental impacts identified during an environmental impact assessment process.
Crossover	Railway infrastructure which provides a train the ability to cross between two adjacent tracks.
Culvert	A totally enclosed drain under a road or railway.
Cut	An excavation for constructing below the natural ground level.
Director-General's Requirements	Requirements for an environmental assessment issued by the Director-General of the NSW Department of Planning in accordance with the *Environment Planning and Assessment Act 1979*.
Down Main	Primary (main) rail line that trains traverse when they are heading away from Sydney (usually positioned on the left when your back is to Sydney).
Erosion	A natural process where wind or water detaches a soil particle and provides energy to move the particle.
Fauna	The animals of a given region or period, taken collectively.
Flora	Plants of a particular region that make up the vegetation of a site.
Fill	Earth used to construct an embankment or artificial surface.
Groundwater	Subsurface water stored in pores of soil or rocks.
Hydrology	The study of rainfall and surface water run-off processes.
Hunter 8 Alliance	Hunter 8 Alliance, which has been formed to deliver a new third track and ancillary infrastructure between Maitland and Minimbah.

Investigation area	The investigation area captures the footprint of disturbance for the third track and other associated works, including construction compounds, haul-roads and spoil-disposal areas, and is defined as a linear corridor which follows the route of the Main Northern Railway between chainages 194.500 kilometres and 224.220 kilometres.
Level crossing	A crossing provided at grade across the railway corridor.
Mitigation	Reduction in severity.
Overbridge	Where a road or pedestrian footway is situated over the railway line.
Proponent	Australian Rail Track Corporation (ARTC).
Rail corridor	The area of land dedicated to the ARTC between Maitland and Minimbah.
Spoil	Excess of rock and/or earth material resulting from construction activities.
Turnout	The intersection and mechanisms for the meeting of two tracks.
Underbridge	Where a road or pedestrian underpass is situated under the railway line.
Up Main	Primary (main) rail line that trains traverse when they are heading toward Sydney (usually positioned on the right when your back is to Sydney).

Executive Summary

Hunter 8 Alliance undertook a preliminary site contamination investigation with limited soil sampling with respect to the proposed Maitland to Minimbah Third Track Project, to assess the likely potential for contamination within the investigation area.

The scope of works for the assessment included a desktop review of site history and environmental features such as geology and hydrology, site walkover assessments and limited soil sampling within the land surrounding the rail line.

A search of the NSW Rail Transport Museum website indicated that the Great Northern Rail Line between Newcastle and Singleton was completed by the end of the 1860's. The historical review indicated that the areas surrounding the rail line are likely to have been used for residential/rural land use from 1908 to the present day, with the exception of a few commercial/industrial premises. No records relating to specific contamination or remediation were identified within the Department of Environment, Climate Change and Water contaminated land register.

A review of the Department of Land and Water Conservation acid sulfate soil risk maps indicated there was only one small area of risk, classified as high probability of occurrence of acid sulfate soil materials within 1 metre of the ground surface. This area was located just within the investigation area, 40 metres south of the railway, between chainage 195.490 - 195.510. It is unlikely that this area will be disturbed by the Project, however if disturbed this poses a severe localised environmental risk.

Hunter 8 undertook site inspections on 1 and 2 July, and 26 August, 2009.

Based on the historical review and site inspection the most likely sources of contamination within the investigation area were considered to be associated with the agricultural activities, imported fill and the rail line. Table E-1 presents a summary of the potential contaminants of concern and associated sources.

Table E-1 Potential Sources of Contamination

Area of Concern	Rational/Details	Potential Chemicals of Concern
Rural properties	Spraying for weed and pest control Use of fertilisers	Total petroleum hydrocarbons (TPH) Polynuclear aromatic hydrocarbons (PAHs) Heavy metals Organochlorine pesticides (OCP) Organophosphate pesticides (OPP)

Area of Concern	Rational/Details	Potential Chemicals of Concern
Rail corridor	Fill and ballast material Asbestos fibres from train brakes Spraying for weeds and pest control Fuels, oils and greases Asbestos and lead paint residues in former buildings Electrical transformers Illegal dumping	Total petroleum hydrocarbons (TPH) Benzene, toluene, ethyl benzene and xylene (BTEX) Polynuclear aromatic hydrocarbons (PAHs) Heavy metals Asbestos Organochlorine pesticides (OCP) Organophosphate pesticides (OPP) Polychlorinated biphenyls **(**PCB)
Noise mounds	Fill and ballast material	Total petroleum hydrocarbons (TPH) Benzene, toluene, ethyl benzene and xylene (BTEX) Polynuclear aromatic hydrocarbons (PAHs) Heavy metals Asbestos
Stockpiles	Fill and ballast material	Total petroleum hydrocarbons (TPH) Benzene, toluene, ethyl benzene and xylene (BTEX) Polynuclear aromatic hydrocarbons (PAHs) Heavy metals Asbestos Organochlorine pesticides (OCP)
Heritage Sites	Fill and ballast material Spraying for weeds and pest control Fuels, oils and greases Asbestos and lead paint residues in former buildings	Total petroleum hydrocarbons (TPH) Benzene, toluene, ethyl benzene and xylene (BTEX) Polynuclear aromatic hydrocarbons (PAHs) Heavy metals Asbestos Organochlorine pesticides (OCP)
Vineyards	Spraying for weeds and pest control Use of fertilisers	Heavy Metals Organochlorine pesticides (OCP) Organophosphate pesticides (OPP)

Area of Concern	Rational/Details	Potential Chemicals of Concern
Industrial properties	Fill and ballast material Spraying for weeds and pest control Fuels, oils and greases Asbestos and lead paint residues in former buildings	Total petroleum hydrocarbons (TPH) Benzene, toluene, ethyl benzene and xylene (BTEX) Polynuclear aromatic hydrocarbons (PAHs) Heavy metals Asbestos Organochlorine pesticides (OCP) Organophosphate pesticides (OPP)
Acid sulfate soils	Potential for acidification, and mobilisation of heavy metals, if disturbed	pH Heavy metals ASS/PASS

Hunter 8 collected soil samples from 55 test pit locations and three surface samples, within the rail corridor and within surrounding grazing land to assess potential contamination issues. A random sampling pattern was applied for this investigation, along with some targeted sampling. Within the rail corridor significant disturbance appears to have occurred. Several stockpiles within the corridor were also sampled. Due to access restrictions some potentially contaminated sites were unable to be sampled. Sampling was mostly undertaken within the immediate vicinity of the rail line.

The investigation program undertaken was considered sufficient to provide an indication as to the potential contamination likely to be encountered within the investigation area. However, the sampling density is not considered sufficient to delineate areas of contamination identified or to provide sufficient information to characterise material for off-site disposal. In addition, areas of unknown potential contamination may exist within the investigation area not identified during this limited investigation.

The typical soils encountered within the investigation area during sampling were fill materials – consisting of ballast, silt, sand, and clay – many of which contained displaced natural materials. These were underlain by natural clay. Typical soils encountered adjacent to or within rural properties consisted of natural clays.

Concentrations of heavy metals, Organochlorine Pesticides, Polynuclear Aromatic Hydrocarbons, Total Petroleum Hydrocarbons, Benzene, Toluene, Ethylbenzene, and Xylene, were reported below the Health-Investigation Level, or threshold concentration, for commercial/industrial exposure settings for all individual samples analysed.

Several samples exceeded the Ecological Investigation Level (EIL) for some heavy metals. While concentrations exceeding EILs may indicate some potential environmental impacts the “decision-making process for assessing urban redevelopment sites” from DEC 2006 does not require consideration of EILs when assessing the suitability of a site for commercial / industrial land use such as rail corridor and roads. Samples exceeding the EILs may present an ecological risk, but are not considered to restrict construction activities. These exceedences

should be considered when determining potential re-use of excavated material along the route, particularly with respect to contamination of adjacent areas and waterways, but given the concentrations found, are unlikely to present a risk of significant impacts.

Based on the investigations undertaken, soils excavated from the agricultural properties and rail corridor are considered suitable for on-site use, with regards to potential contamination risk to human health and the environment.

The indicative waste classification based on the results to date indicates that soils would generally be classified as General Solid Waste. However, several samples exceeded the General Solid Waste guidelines without TCLP (Toxicity Characteristic Leaching Procedure) analysis. These results are indicative only, based on the insitu sampling undertaken and on the total concentrations of constituents. Incorporation of TCLP analysis is likely to result in a reduction in waste classification.

An environmental risk assessment was carried out for the Project, in regard to contamination, and resulted in the recommendation of the following mitigation measures:

- Undertake Phase 2 Contamination Assessments in identified areas of concern likely to contain contaminants, where limited access has prevented investigation to date. This comprises the metal fabrication and engineering property on Standen Drive, Energy Australia Depot on Wollombi Road, truck haulage property on Wollombi Road, and Former Hunter Distillery property.
- Develop and implement a Spoil and Fill Management Plan (SFMP) as part of the Construction Environmental Management Plan (CEMP) for managing possible contaminated materials not encountered and assessed during this investigation. The SFMP for the proposed works should detail appropriate procedures for the handling, stockpiling and assessing potentially contaminated materials during the works. The SFMP should also include a contingency plan for unexpected hazards that may be encountered during site works.
- Manage waste in accordance with relevant legislation.
- Implementation of Asbestos Management Plan as part of the CEMP, including procedures for management and disposal should asbestos be identified. Should any signal huts or structures within the site area be scheduled for removal, it is recommended that a hazardous material survey be undertaken prior to demolition.
- Implementation of an Acid Sulfate Soil Management Plan as part of the CEMP.

1. Introduction

This preliminary site contamination investigation has been undertaken by the Hunter 8 Alliance on behalf of the Australian Rail Track Corporation (ARTC) for the Maitland to Minimbah Third Track Project (referred to as 'the Project'). This report has been prepared to identify areas of concern regarding potential contamination.

1.1 Background

ARTC was created by the Commonwealth and State Governments in 1998 to provide a single body responsible for the National Interstate Rail Network. ARTC is a Commonwealth Government corporation and currently has responsibility for the management of over 10,000 route kilometres of standard gauge interstate rail track in South Australia, Victoria, Western Australia and New South Wales (NSW), as well as the Hunter Valley Rail Network and other regional rail links in NSW.

The Hunter Valley Rail Network extends from the Port of Newcastle to Ulan and Narrabri in the west. It is used by passenger services, freight, wheat and coal services. The majority of trains carry coal from mines located across the Hunter Valley to either Carrington (Port Waratah) or Kooragang Island ports at Newcastle for loading onto ships for export.

Due to the forecast increase in coal throughput at the Port of Newcastle to 190 million tonnes per annum (mtpa) by 2012, a number of rail infrastructure improvements to the Hunter Valley Rail Network have been proposed by ARTC. One of the key improvement projects included in the ARTC ten-year strategic plan is a proposed third track adjacent to the existing Main Northern Railway between Maitland and Whittingham, known as the Maitland to Whittingham Third Track Project.

The Maitland to Whittingham Third Track Project is divided into two stages. Stage 1 consists of the construction of the third track between Minimbah and Whittingham. Project Approval for this project was granted by the Minister of Planning on 26 May 2009 and construction commenced in July 2009.

Stage 2 consists of the construction of the third track between Maitland and Minimbah, known as the Maitland to Minimbah Third Track Project. Stage 2 is the subject of this Preliminary Site Contamination Investigation and is referred to as 'the Project'.

The purpose of the Project is to increase rail reliability and future capacity between the Hunter Valley and the Port of Newcastle. In addition to providing increased track capacity, the Project aims to improve operational performance along the route. These improved efficiencies would be created through:

- Reduced impacts on coal traffic due to track maintenance activities.
- Reduced loss of freight train paths due to shadow effects from passenger services.
- Reduced loss of available train paths due to train breakdowns.

The Project would also bring benefits to the local and broader community by generating up to 650 full time jobs during construction, creating opportunities for local and regional goods and service providers, and providing greater security for existing coal industry jobs.

1.2 Description of the Project

The Hunter 8 Alliance, on behalf of the ARTC, is proposing to construct a third track adjacent to the existing Main Northern Railway between Maitland and Minimbah. The proposed third track would commence in Farley approximately 2 kilometres west of Maitland Station at approximate chainage 194.500 kilometres and would run adjacent to the Main Northern Railway for approximately 30 kilometres concluding at Minimbah at approximate chainage 224.200 kilometres.

The proposed third track would be predominantly located on the Up side of the Main Northern Railway. Approximately 3 kilometres of track, from chainages 210.170 kilometres to 211.180 kilometres and 214.060 kilometres to 216.000 kilometres, would be located on the Down side.

The Project would involve the construction of approximately 30 kilometres of new rail track as well as construction and/ or modification of major infrastructure along the Main Northern Railway. A summary of the major elements of the Project is provided in Table 1-1.

Table 1-1 Major Project Elements

Project Elements	
Earthworks	Major cut and fill earthworks along the route. Other minor earthworks.
Track	Approximately 30 km of new track including turnouts and junctions. Relocation of turnouts from Minimbah and Branxton to Belford. Upgrade of maintenance siding turnouts at Branxton. Track reconditioning of existing Up Main at Greta and Branxton Stations and of the Branxton crossovers.
Drainage	Central and cess track drainage. Amendments to 53 culverts for cross drainage. Re-alignment of Sawyers Creek. Other drainage works around new structures.
Bridges	A new rail underbridge at Stony Creek and Wollombi Road, Farley. Closure of the stock crossing at Farley. Demolition of the existing rail overbridge at Old North Road, Allandale. A new rail underbridge at Allandale Road, Allandale. A new rail underbridge for an unnamed tributary of Anvil Creek (chainage 207.776 km).

Project Elements	
	Demolition and replacement of the existing rail underbridge at an unnamed tributary of Anvil Creek, Greta (chainage 209.989 kilometres). A new rail underbridge at Sawyers Creek, Greta. Modification of the existing rail overbridge at Bridge Street, Branxton. A new rail underbridge at Black Creek, Belford. A new rail underbridge at Jump Up Creek, Belford.
Station Modifications	Modifications to Lochinvar Railway Station. Modifications to Greta Railway Station. Modifications to Branxton Railway Station.

1.3 Investigation Area

The investigation area for this preliminary site contamination investigation is a linear corridor which follows the route of the Main Northern Railway between chainages 194.500 kilometres and 224.220 kilometres. The location of the investigation area is shown in Figure 1 in Appendix B.

The investigation area captures the footprint of disturbance for the third track and other associated works, including construction compounds, haul roads and spoil disposal areas.

The sampling program was based on knowledge of the investigation area current at the time of undertaking the desktop review and site inspection. As a result, several sample locations are located outside of the construction impact zone. These samples have been included in this report based on their proximity to the site or selected as representative locations where site access was limited.

1.4 Objectives and Purpose of this Report

The objectives of this preliminary site contamination investigation are to:

- Assess the potential impact of construction and operation of the Project on soil contamination.
- Address the Director General's Requirements (DGRs) for the Environmental Assessment of the Project.

The DGRs identify general construction impacts, including impacts relating to soil contamination, as key issues for the Environmental Assessment. Table 1-2 outlines the DGRs relating to contamination and where they have been addressed in this report.

Table 1-2 Director-General's Requirements – Contamination

Director-General's Requirements	Where Addressed in this Report
General Construction Impacts	
Assess and present a management framework for earthworks, including a considered approach to minimising impacts associated with the excavation, movement, stockpiling, rehabilitation and disposal of spoil and fill. Consideration should be given to:	
◗ Soil characteristics, including acid sulfate soils and potential land contamination.	Section 2 and Section 5
◗ A strategy for managing earthworks with a particular focus on those works that have the greatest potential to disturb soils that are contaminated, have high erosion and run off hazards and adverse impacts on watercourses, and a broader, more generic approach for ongoing construction management.	(Section 7) Recommend development and implementation of a Construction Environmental Management Plan.

1.5 Scope of Investigation

The preliminary site contamination investigation included the following scope:

- Review of site history including any available historical land titles, aerial photographs, Section 149 (2&5) Planning Certificates, and Department of Environment, Climate Change and Water contaminated land register.
- Review of geology, Department of Water and Energy groundwater bore database, hydrology and topography information for the site.
- Site inspection to identify any potential contamination issues or potential areas of concern.
- Limited soil sampling.
- Preparation of a report summarising the results of the preliminary site contamination investigation.

This scope is subject to the limitations as discussed below in Section 1.6.

1.6 Limitations

This preliminary site contamination investigation report for the Project has been prepared by Hunter 8 for ARTC. No warranties, expressed or implied, are offered to any third parties and no liabilities will be accepted for the use of this report by any third party.

The study was conducted by an experienced environmental engineer and was subject to internal review by a senior environmental engineer. It should be noted, however, that in gathering facts for the study, Hunter 8 relied on verbal information supplied by the client, on site records, and on visual inspection of the investigation area, which have not necessarily been independently verified.

An understanding of the investigation area conditions depends on the integration of many pieces of information, some regional, some site specific, some structure-specific and some experienced based. Hence, this report should not be altered, amended or abbreviated, issued in part and issued incomplete in any way without prior checking and approval by Hunter 8. Hunter 8 accepts no responsibility for any circumstances, which arise from the issue of the report, which has been modified in any way as outlined above.

The extent of sampling of soils and subsequent analysis has been necessarily limited, and has been targeted towards areas where contamination is considered to be most likely, based on the knowledge of the site history and visual observation. This approach maximises the probability of identifying contaminants; however, it may not identify contamination that occurs in unexpected locations or from unexpected sources.

Further, soil conditions are often variable, resulting in non-homogenous contaminant distributions across a site. Contaminant concentrations have been identified at chosen sample locations; however, conditions between sample locations can only be inferred on the basis of the estimated geological conditions and the nature and extent of identified contamination. Boundaries between zones of variable contamination are often indistinct, and have been interpreted based on available information and the application of professional judgement. The accuracy with which the sub-surface conditions have been characterised depends on the frequency and methods of sampling and the uniformity of sub-surface conditions and is therefore limited by the scope of works undertaken.

This report does not provide a complete assessment of the environmental status of the investigation area and it is limited to the scope defined herein. Should further information become available regarding conditions of the investigation area including previously unknown sources of contamination, Hunter 8 reserves the right to review the report in the context of the additional information.

2. Existing Environment

2.1 Regional Context, Site Location and Surrounding Land Uses

The Project would include a new track approximately 30 kilometres in length that would traverse through the Maitland, Cessnock and Singleton Local Government Areas (LGA) within the Hunter Valley, NSW. The third track would be constructed adjacent to the existing Main Northern Railway, connecting to the existing rail network near Maitland Station and continuing to the east of Minimbah Bank (approximately 224.220 kilometres).

The regional topography of the area surrounding the Project comprises primarily low lying areas of valleys and alluvial floodplains, following gently undulating hills of slopes typically between 1^0 and 6^0.

Land use adjacent and surrounding the existing rail corridor is a mixture of urban and rural residential dwellings, commercial / industrial premises, viticulture and grazing land. Four urbanised areas exist between Maitland and Minimbah, at Maitland, Lochinvar, Greta and Branxton.

The Project impacts upon a number of existing rail stations including Lochinvar, Greta and Branxton. The New England Highway runs generally parallel to the Main Northern Railway.

2.2 Zoning

The section of track from Farley to Lochinvar is located within the Maitland LGA, the section of the track from Lochinvar to Branxton is located within the Cessnock LGA, whilst the remaining section of the track to the east of Minimbah Bank is located in the Singleton Council LGA.

The Project is therefore covered by the *Maitland Local Environmental Plan 1993,* the *Cessnock Local Environmental Plan 1989* and the *Singleton Local Environmental Plan 1996* respectively.

Maitland Local Environmental Plan 1993

The majority of the Project located within Maitland LGA is zoned 5(b) Special Uses Railway. The Maitland Local Environmental Plan (Maitland LEP) states that under this zoning, development with consent is permitted for railway purposes authorised under the *Transport Administration Act 1988*.

In addition to the above zoning, land that would be included in the Project has the following land use zonings:

- 1 (b) Secondary Rural Land.
- 4 (a) General Industrial.
- 4 (b) Light Industrial.
- 6 (b) Private Recreation.

Cessnock Local Environmental Plan 1996

The majority of the Project located within Cessnock LGA is zoned 5(b) Special Uses (Railway). The Cessnock Local Environmental Plan (Cessnock LEP) states that under this zoning, development with consent is permitted for railway purposes.

Land through which the proposed works area passes is generally rural/ rural residential with areas of residential development at Branxton and Greta.

In addition to the above zoning, land that would be included in the Project has the following land use zonings:

- 1 (a) (Rural "A" Zone).
- 1 (b) Secondary Rural Land.
- 1 (c) (Rural–Residential / Rural (Small Holdings) Zone).
- 2(a), 1(a), 7(b), 3(a).
- Residential 1.

Singleton Local Environmental Plan 1993

The majority of the Project located within Singleton LGA has no specific zoning for railway purposes. Discussions with Singleton Council Planning staff indicate that the rail corridor takes on the zonings of the adjacent lands.

Land through which the proposed works area passes is generally rural / residential.

Land that would be included in the Project has the following land use zonings:

- 1 (a) Rural Zone.
- Residential 1.

2.3 Geology and Soils

2.3.1 Geology

Reference to *Geological Survey of New South Wales, Statewide geodatabase, 2003* (electronic GIS data) shows that the investigation area is characterised by the geology presented in Table 2-1.

Table 2-1 Geological Descriptions

Group	Formation	Rock Type	Approximate Chainage (km)
Maitland Group	Mulbring Siltstone (Pmm)	Siltstone, sandstone	219.0-220.5
	Muree Sandstone (Pms)	Sandstone, conglomerate, minor clay	218.5, 220.5, 225.0

Group	Formation	Rock Type	Approximate Chainage (km)
	Branxton Formation (Pmb)	Conglomerate, sandstone, siltstone	210.5-218.5, 220.5-224.5
Greta Coal Measures	Greta Coal Measures (Pg)	Sandstone, conglomerate, silstone, coal	194.5-195, 210.5
Dalwood Group	Farley Formation (Pdf)	Silty sandstone (Sandstone)	195.0-195.5, 207.0-210.0
	Rutherford Formation (Pdr)	Siltstone, marl, minor sandstone	195.5-199.0, 205.0-207.0
	Allandale Formation (Pda)	Conglomerate, lithic sandstone	199.0-199.5, 204.0-205.0
	Lochinvar Formation (Pdl)	Basalt, siltstone, sandstone	199.0-204.0

2.3.2 Soils

Reference to the 1:100,000 Soil Landscape map for Newcastle and the 1:250,000 Soil Landscape map for Singleton (Soil Conservation Service of NSW, 1991) shows that the investigation area is characterised by eight main soil landscape units.

A description of each of these units, including underlying geology, topography, soil descriptions and soil limitations, is provided in Table 2-2.

Table 2-2 Soil Landscape Unit Descriptions

Unit	Topography	Soil Description	Soil Limitations	Approximate Chainage (km)
Rivermead (ri)	Extensive undulating alluvial terraces.	Deep well drained to imperfectly drained sandy clay loam, sandy clay, and clay.	High foundation hazard, localised flood hazard, seasonal waterlogging.	193.80-194.85

Unit	Topography	Soil Description	Soil Limitations	Approximate Chainage (km)
Hunter variant a (hua)	Extensive alluvial plains.	Deep moderately well to imperfectly drained and poorly drained clays, alluvial soils and siliceous sands (swampy back plains of Hunter soils landscape).	Flood hazard, foundation hazard, localised permanently high water tables and seasonal waterlogging.	195.50 (small area south of rail line)
Bolwarra Heights (bh)	Rolling low hills.	Moderately deep well drained to imperfectly drained gravely loam, gravely sandy clay loam, and clay.	Moderate foundation hazard, water erosion hazard, high localised seasonal run-on and waterlogging, localised steep slopes with mass movement hazard.	194.05-196.65, 197.05-197.35 (south of corridor)
Wallalong variant a (wga)	Alluvial fans and drainage plains.	Moderately deep-to-deep, moderately to imperfectly drained loam, sandy clay loam, and clay.	High water erosion hazard, foundation hazard, high-localised seasonal run-on and waterlogging.	196.30-197.60 (changes to Singleton sheet – Branxton classification)
Rothbury (ro)	Undulating to rolling hills.	Moderately deep-to-deep, moderately to imperfectly drained loam, sandy loam, silt loam, clay loam, loamy sand, and clay.	Moderate to very high erosion hazard, moderate to low fertility.	213.70-214.20, 217.70-218.20, 220.10-222.10, 222.45-222.70, 223.45-224.22
Branxton (bx)	Undulating rises to low hills and creek flats.	Moderately deep-to-deep, moderately to imperfectly drained sandy loam, loamy sand, and clay.	Moderate to very high erosion hazard, moderate to low fertility.	197.60-199.30, 204.80-213.70, 214.05-217.70, 218.20-220.15, 222.10-222.45, 222.70-224.22

Unit	Topography	Soil Description	Soil Limitations	Approximate Chainage (km)
Lochinvar (lv)	Undulating rises with numerous drainage lines.	Moderately deep-to-deep, moderately to imperfectly drained silty clay loam, sandy clay loam, sandy loam, loam, and clay.	Moderate to very high erosion hazard, moderate to low fertility.	199.30-204.95,

Source: Soil Conservation Service of NSW, 1991.

2.3.3 Potential Acid Sulfate Soils

A review of the former Department of Land and Water Conservation acid sulfate soil risk maps (DLWC, 1992) indicated there was only one small area of risk, classified as high probability of occurrence of acid sulfate soil materials within 1 metre of the ground surface. This area was located just within the investigation area, 40 metres south of the railway, between chainage 195.490 -195.510.

2.4 Hydrology

The Project investigation corridor is within the Hunter-Central Rivers Catchment Management Authority (CMA) area where the Hunter River flows from west to east typically between around 2.5 and 6 kilometres north of the alignment. Around East Maitland however, the river is only around 1.5 kilometres due east of the investigation corridor at its closest point. A number of tributaries and un-named drainage channels of the Hunter River intersect the investigation corridor and hence, may be affected by the development. The main watercourses that intersect or run close to the alignment of the corridor are shown in Figures 12a to 12e in Appendix B and include, from east to west:

- Telarah Lagoon and Wentworth Swamps.
- Swamp Creek.
- Stony Creek.
- Lochinvar Creek.
- Anvil Creek.
- Sawyers Creek.
- Black Creek.
- Jump Up Creek.

2.5 Hydrogeology

Typically, groundwater follows surface topography and local drainage patterns and flows from higher elevations towards lower elevations. Surface water flow is generally in a northerly or easterly direction towards the Hunter River, as outlined above in Section 2.4. Given the proximity of the Hunter River, it is assumed that the groundwater flow is also in a northerly or easterly direction towards the Hunter River.

Hunter 8 requested a search of the NSW Department of Water and Energy (DWE) database. The results of this search showed that there are 510 registered monitoring wells within approximately 30 kilometres of the investigation area, however only three were within one kilometre of the Investigation area (GW080479, GW200442, and GW034601). The map showing the results of the search by DWE for the groundwater wells is presented as Figure 11 in Appendix B and a summary of monitoring well information is presented in Appendix C.

2.6 Site History

2.6.1 Historical Aerial Photographs

Historical aerial photographs of the Site and surrounding area (obtained from the Department of Lands NSW Aerial Photography Register) were reviewed, with the results summarised in Table 2-3 below.

Table 2-3 Reviews of Historical Aerial Photographs

1963/1967	Observations
07/01/1967 Run: 5P Print: 2682 Photo: NSW 1481 Project: Newcastle Scale: 1:39500 Chainage: 193.780- 195.900; 193.780-195.450	Highly utilised segment. The site begins at the 192.9 km chainage marker. Lands parallel to the existing rail line are utilised for residential, recreation, rail depot works, agricultural and some industrial properties. Swamp Creek and a recreation reserve are present. There is an industrial property at Wollombi Road and Green Street (marking the western extent of the photograph) under construction. There also appears to be another industrial property at Elizabeth Street under construction.
07/01/1967 Run: 5P Print: 2680 Photo: NSW 1481 Project: Newcastle Scale: 1:39500 Chainage: 194.050-202.900; 196.100-200.200; 194.050-198.150	Cleared agricultural or forested land runs adjacent to the rail line throughout this photograph. South-west of Stony Creek there is an area of lower topography, showing some minor signs of physical disturbance.

1963/1967	Observations
11/1963 Run: 5S Print: 5482 Photo: NSW 1192 Project: Cessnock Scale: 1:42500 Chainage: 197.150- 204.400; 200.100-204.250; 203.000-213.750-208.300- 208.000-	Cleared grazing/farming land occupies the properties surrounding the rail line. At Station Lane, Lochinvar there are a number of structures to the east and Lochinvar Station is present to the west.
11/1963 Run: 5S Print: 5484 Photo: NSW 1192 Project: Cessnock Scale: 1:42500 Chainage: 203.000-213.750; 204.000-208.300; 208.000-213.100	Cleared grazing land, residential and forested lands occupy the properties surrounding the rail track. Two track crossings are present; the one at Old North Road is located adjacent to an area of disturbance on either side of the track, possibly relating to filling works. To the east of the track crossing at Allandale Road, there is another area of possible track filling works. The most prominent feature of this photograph is on the southern side of the north-west of Allandale Station, being the former Greta Army and Migrant Camp. In this photograph, the layout of the site is very clear and many building structures remain in place (although historical searches revealed the site had been vacant for several years). South of the Nelson Street overpass at Greta, there are a number of rural properties and a large disturbed area, possibly a soil stockpile/cutting point. On the southern side of Greta Station there is a fairly large area of what appears to be construction works.
11/1963 Run: 4S Print: 5460 Photo: NSW 1192 Project: Cessnock Scale: 1:42500 Chainage: 211.300-217.300; 213.000-217.000	Adjacent to the existing rail line in this photo the land is cleared grazing/farming land, forested land or residential areas on the outskirts of Branxton. To the west of Branxton, there is a road leading in from the New England Highway. On the north-east side of this road there is an area of excavation works, whilst on the south-east there is scattered vegetation.

1963/1967	Observations
11/1963 Run: 4S Print: 5467 Photo: NSW 1192 Project: Cessnock Scale: 1:42500 Chainage: 215.500-223.800; 219.700-223.000; 216.400-220.700	Cleared grazing/agricultural and forested lands occupy the properties surrounding the rail track. The farms to the west of Black Creek and south of Standen Road contain cultivated crops. In this photograph, there is property to the west of Pothana Lane that shows an area of excavation adjacent to the rail tracks.
11/1963 Run: 4S Print: 5466 Photo: NSW 1192 Project: Cessnock Scale: 1:42500 Chainage: 221.950- 224.200; 222.000-224.200	The remaining land in the western portion of the subject site adjacent to the tracks is mainly cleared and used for grazing purposes. Farms surrounding Jumpoff Creek contain cultivated crops. On the north-east side of the McDoull Road crossing there is an area of disturbance, possibly the Belford Station site.

1974/1975	Observations
01/04/1975 Run: 4 Print: 982 Photo: NSW 2299 Project: Newcastle Scale: 1:40000 Chainage: 193.780-201.400;196.100- 200.000; 193.780-196.550; 193.780-195.500	Highly utilised segment. There is a new industrial property at Elizabeth Street. There is also an industrial subdivision on the north side of the track, however only several buildings are located to the south, near the rail line.

1974/1975	Observations
01/04/1975 Run: 4 Print: 9118 Photo: NSW 2316 Project: Cessnock Scale: 1:40000 Chainage: 196.600-207.150; 200.500- 204.550	The site, throughout the majority of this photograph, is surrounded by cleared grazing land with a number of rural properties. South-west of Stony Creek, there is a transect of disturbed lands, possibly relating to track fill works or drainage works on a tributary creek.
25/05/1975 Run: 4 Print: 9120 Photo: NSW 2314 Project: Cessnock Scale: 1:40000 Chainage: 204.900- 210.950; 208.350-210.950; 204.900-208.600	The most prevalent feature in this photograph is still the former Greta Army and Migrant camp. There are fewer structures on site than in the 1963 photo. The road and building foundation layout and a number of remaining structures can be seen quite clearly.
25/05/1974 Run: 3 Print: 5409 Photo: NSW 2314 Project: Cessnock Scale: 1:40000 Chainage: 209.450- 216.750; 209.450-213.550	To the south of Greta Station is a number of grouped structures, potentially an industrial/residential development, that are located inside a walled enclosure.
08/09/1974 Run: 3 Print: 5408 Photo: NSW 2260 Project: Cessnock Scale: 1:40000 Chainage: 210.200- 220.950; 215.850-220.000; 213.600-217.800	The outskirts of Branxton township run adjacent to the train tracks. To the west of this is a large stockpile, potentially associated with coal mining works, with associated dams. Only residential properties appear to be present to the west of Branxton in this photo.

1974/1975	Observations
08/09/1974 Run: 3 Print: 5406 Photo: NSW 2260 Project: Cessnock Scale: 1:40000 Chainage: 219.200- 224.200; 220.000- 224.200	The land adjacent to the tracks appears to be mainly cleared grazing land. West of Pothana Lane, the adjacent property contains three dams adjacent to the rail line and there is one property between the rail line and Jumpoff Creek that is used for cropping/agriculture.

1984	Observations
13/05/1984 Run: 4 Print: 8917 Photo: NSW 3389 Project: Cessnock Scale: 1:40000 Chainage: 193.780-195.700; 193.780-195.250;	Highly utilised segment. The industrial property at Elizabeth Street is larger and has stored materials in the yards. No other significant changes.
13/05/1984 Run: 4 Print: 8919 Photo: NSW 3389 Project: Cessnock Scale: 1:40000 Chainage: 193.780-203.650; 201.100-230.650; 195.050-199.300; 193.780-198.100	There are no significant changes from the 1975 photograph.

1984	Observations
13/05/1984 Run: 4 Print: 8921 Photo: NSW 3389 Project: Cessnock Scale: 1:40000 Chainage: 201.750- 212.250; 208.850-212.250; 203.500-208.350	Much of the lands throughout this segment remain cleared grazing lands. The layout of the former Greta Army and Migrant Camp is less defined in this photo. The area to the south of the Nelson Street overpass at Greta appears to have a large area of bare earth present, possibly related to soil stockpiles/ or sand mining.
13/05/1984 Run: 3 Print: 894x Photo: NSW 3389 Project: Cessnock Scale: 1:40000 Chainage: 210.000- 220.000; 216.000-220.000; 213.550-217.800	Fewer rural properties. The quarry/mine site to the north-west of Branxton is present, possibly associated with Ayrefield Colliery, which is located several kilometres south. An industrial property at Standen Road is present in the form of a single warehouse.
13/05/1984 Run: 3 Print: 8945 Photo: NSW 3389 Project: Cessnock Scale: 1:40000 Chainage: 218.150-224.200; 222.000-224.200; 219.300-223.600	There are fewer cleared rural properties than in the 1974 photograph, with more rural-residential properties appearing. Some cultivated areas present on the south side of the rail line.

1994	Observations
03/09/1994 Run: 7 Print: 115 Photo: NSW 4236 Project: Cessnock Scale: 1:25000 Chainage : 193.780 (Start of investigation area) -195.350; 193.780-194.700;193.780-195.350;193.780-193.970	Highly utilised segment. The New England Highway overpass is now present in this photo. No other significant changes from the 1984 photo.
03/09/1994 Run: 7 Print: 114 Photo: NSW 4236 Project: Cessnock Scale: 1:25000 Chainage: 193.780-197.600; 193.780-196.500	Lands parallel to the existing rail line are utilised for agricultural, rural-residential, and recreation. No significant changes from the 1984 photograph
03/09/1994 Run: 6 Print: 126 Photo: NSW 4236 Project: Cessnock Scale: 1:25000 Chainage: 194.800-201.100; 196.300-199.150; 195.000-197.500	A golf course is now present on the north side of the rail tracks. The industrial subdivision adjacent to the golf course is larger than in the 1984 photograph.
03/09/1994 Run: 6 Print: 128 Photo: NSW 4236 Project: Cessnock Scale: 1:25000 Chainage: 200.550-208.400; 201.180- 203.600	The site, throughout the majority of this photograph, remains surrounded by cleared grazing land with a number of rural properties. At Station Lane, Lochinvar (adjacent to Lochinvar Railway Station) a ballast stockpile is present on the northern side of the tracks.

1994	Observations
03/09/1994 Run: 5 Print: 164 Photo: NSW 4236 Project: Cessnock Scale: 1:25000 Chainage: 209.100- 214.300; 209.100-211.300	Structures associated with the former Greta Army and Migrant Camp are less distinct than in the 1984 photo. The area to the south of the Nelson Street overpass at Greta still has possible soil stockpiles present. Throughout this segment there are now more rural-residential properties and agriculture, where previously it was more cleared grazing lands.
03/09/1994 Run: 5 Print: 162 Photo: NSW 4236 Project: Cessnock Scale: 1:25000 Chainage: 213.300-219.600;213.800-216.750	To the west of Branxton, on the northern side of the line, the area of disturbance (potentially related to coal mining/stockpiles) is still present.
03/09/1994 Run: 5 Print: 160 Photo: NSW 4236 Project: Cessnock Scale: 1:25000 Chainage:217.500-224.200;222.850-220.900; 217.500-220.000	No significant changes from the 1984 photograph.
03/09/1994 Run: 5 Print: 160 Photo: NSW 4236 Project: Cessnock Scale: 1:40000	No significant changes from the 1984 photograph.

2004	Observations
08/10/2004 Run: 7 Print: 176 Photo: NSW 4876 Project: Newcastle Scale: 1:25000	Highly utilised segment. The site begins at the 192.9 km chainage marker. Lands parallel to the existing rail line are utilised for agricultural, residential, recreation, rail depot works and some industrial properties. The New England Highway overpass, Swamp Creek and a recreation reserve are present. The industrial property at Wollombi Road and Green Street (marking the western extent of the photograph) potentially has a corrugated asbestos-cement roof of considerable size (not clear in previous photographs).
08/10/2004 Run: 6 Print: 170 Photo: NSW 4876 Project: Newcastle Scale: 1:25000	Lands parallel to the existing rail line are utilised for agricultural, rural-residential, and recreation. The most significant feature is the presence of the golf course adjacent to the tracks on the northern side and a large industrial sub-division further north.
08/10/2004 Run: 6 Print: 172 Photo: NSW 4876 Project: Newcastle Scale: 1:25000	The investigation area, throughout the majority of this photograph, is surrounded by cleared grazing land with a number of rural properties. At Station Lane, Lochinvar (adjacent to Lochinvar Railway Station) there is a large ballast stockpile on the northern side of the tracks.
26/09/2004 Run: 6 Print: 156 Photo: NSW 4873 Project: Cessnock Scale: 1:25000	Cleared grazing/farming land occupies the surrounding properties, with a number of rural properties scattered throughout. Two overpasses, at Old North Road and Allandale Road, transverse the tracks. In between these two crossings, there are a number of soil stockpiles on the northern side of the tracks near Allandale Station. Further west, are the remains of the former Greta Army and Migrant Camp. A number of foundation structures and the remains of road layouts and drainage features are the only visible remnants.
26/09/2004 Run: 5 Print: 169 Photo: NSW 4873 Project: Cessnock Scale: 1:25000	Large portions of the surrounding lands in this photo are forested, with the areas of cleared grazing/farming land, and some residential areas where the existing tracks occupy land on the outskirts of townships. In areas surrounding Greta and Branxton Railway Station, a number of soil and ballast stockpiles/fill mounds are present. To the west of Branxton, on the northern side of the rail line, the previous disturbed/stockpile area now appears considerably smaller.

2004	Observations
26/09/2004 Run: 5 Print: 171 Photo: NSW 4873 Project: Cessnock Scale: 1:25000	Much of the land adjacent to the existing rail line in this photo is cleared grazing/farming land. One industrial property is present, at Standen Drive level crossing at Lower Belford. Stored material, scrap metal etc is present at this site. Towards western extent of this photograph, there is a property containing several large dams/ponds in close proximity to the existing rail line.
26/09/2004 Run: 5 Print: 173 Photo: NSW 4873 Project: Cessnock Scale: 1:25000	Cleared grazing/farming land, with scattered pockets of forested land accounts for the remaining lands in the western portion of the subject site. Two vineyards are present on the southern side of the rail line.

Based on a review of the aerial photographs covering the Project, Hunter 8 identified the following sites as potential sources of contamination:

- Industrial property at Wollombi Road and Green Street (195.2-195.5 kilometres).
- South-west of Stony Creek – area of disturbance (195.6-196.5 kilometres).
- South-east of Greta Station - Former Greta Army and Migrant Camp (208.0-208.6 kilometres).
- South of Nelson Street overpass - Disturbed area/soil stockpiles (210.6 kilometres).
- West of Branxton Station – Stockpile area (potentially related to Ayrefield colliery works) (216.0 kilometres).
- Industrial property at Standen Drive (217.8-218.0 kilometres).
- Property adjacent Pothana Lane containing large dams/ponds adjacent to the rail line (221.2-221.7 kilometres).
- Vineyards present on the southern side of the rail line (214.6-214.8 and 222.9-223.5 kilometres).

2.6.2 Certificate of Title Review

A historical title search was carried out for the several sites identified in the aerial photograph review. Title information was obtained from Advanced Legal Search Pty Limited. Results of the historical title search did not reveal any additional information for the purpose of this investigation.

2.6.3 Department of Environment, Climate Change and Water Contaminated Land Register

A search of the Department of Environment, Climate Change and Water contaminated land register was carried out for the investigation area. No records relating to specific contamination or remediation were identified.

2.7 Site Inspection

Hunter 8 undertook site inspections on 1 and 2 July, and 26 August, 2009. Sections 2.7.1-2.7.20 below, detail the results of the site inspections.

Given the extended length of the Project (approximately 30 kilometres), the majority of observations have been divided into rail chainage lengths, for the purpose of data management.

The investigation area is presented in Figures 1 to 10 and 12, in Appendix B.

2.7.1 Chainage 193.8-195.0 Kilometres

The railway line in this area ran along a raised ballast embankment. The general topography sloped north to south. The most significant feature was a pair of stockpiles north of the railway at chainage 194.4 kilometres, containing a mixture of soil and ballast, believed to be excess spoil from the bi-directional signal upgrade works.

2.7.2 Chainage 195.0-197.0 Kilometres

This segment began in the Maitland LGA 200 metres west of Lismore St, Telarah and extended west for 2 kilometres. The area was generally rural with partly forested land north of the railway at the western end of the segment. Some isolated industrial land was located north of the railway towards the beginning of the segment, and to the south of the railway near the middle of the segment. The view to the north was limited by the presence of a high earth mound running most of the length of the segment. There was a vegetated soil stockpile north of the railway and access track at chainage 195.05 kilometres and a group of stockpiles, predominately ballast, at chainage 195.35 kilometres. Dumped building materials, including particle board, timber and laminate, were found north of the railway approximately at chainage 195.5 kilometres, adjacent to the fence of the cleared area bordered by Wollombi Road. There were stockpiles of mixed composition south of the railway at chainages 196.1, 196.2, 196.4, and 196.45 kilometres. Two dumped and rusted cars were in the paddock south of the railway at chainage 196.84 kilometres and an old hut was located north of the railway at 196.97 kilometres. The railway line in this segment ran along a raised ballast embankment approximately 1-2 metres above surrounding ground level. The surrounding topography generally sloped south to north.

2.7.3 Chainage 197.0-199.0 Kilometres

This segment began in the Maitland LGA amongst grazing lands at the 197.0 kilometre chainage marker and extended west for 2 kilometres. The area was predominately rural grazing land with some partly forested areas. The earth mound continued from the previous segment to chainage 197.4 kilometres. North of the railway at chainage 197.55 kilometres there was a bare area with two ballast stockpiles and at chainage 198.4 kilometres there was a pile of concrete slabs and metal sheeting. The railway line in this area ran along a raised ballast embankment approximately 1-2 metres above surrounding ground level. The surrounding topography generally sloped south to north. Oil and grease staining was noticeable on ballast in the Down Main, while ballast in the Up Main appeared to have been recently replaced or cleaned and had no noticeable staining.

2.7.4 Chainage 199.0-201.0 Kilometres

This segment began in the Maitland LGA amongst grazing lands at the 199.0 kilometre chainage marker and extended west for 2 kilometres. The surrounding land use to the south of the railway was rural, with rural residential development on the northern side. This section of track was located in a generally flat to undulating area with the rail corridor generally running along a raised embankment. Some minor oil and grease stains were noted within the track area.

2.7.5 Chainage 201.0-203.0 Kilometres

This segment began in the Maitland LGA 200 m west of Winders Lane, Lochinvar and extended west for 2 kilometres. This segment was located within a localised undulating area. The surrounding area was generally rural/residential and the historic homestead ‘Clifton’ was located approximately 50 metres south of the level crossing. The railway lines were located within a cutting on a small ballast embankment. The local topography generally sloped down from the south towards the north. Significant oil staining was noted in the Down Main the full visible length of the track in this area. Minor staining was also noted in the Up Main.

2.7.6 Chainage 203.0-205.0 Kilometres

This segment began in the Maitland LGA 400 metres southwest of Lochinvar Railway Station and extended west for 2 kilometres. The surrounding land use to the south of the railway was rural, with rural residential development on the northern side. This section of track was located in a generally flat to undulating area with the rail corridor generally at natural level or in cuttings and the tracks on a slight ballast embankment. Some minor oil and grease stains were noted within the track area.

2.7.7 Chainage 205.0-207.0 Kilometres

This segment began in both the Maitland and Cessnock LGAs (running parallel with the border) 175 metres west of the Old North Rd overpass at Lochinvar and extended north-west into the Cessnock LGA for 2 kilometres. To the east of the Allandale Road overpass the area was predominately located in a rural / residential area with topography gently sloping to the north. To the west of the Allandale Road overpass fill material has been used to raise the track. A number of rusted, 44-gallon drums were noted towards the western end of this segment. Significant oil staining was noted in the both tracks the full visible length of the track in this area.

2.7.8 Chainage 207.0-209.0 Kilometres

This segment began in both the Maitland and Cessnock LGAs (running parallel with the border) amongst grazing lands at the 207.0 kilometre chainage marker and extended north-west for 2 kilometres. The area was a mixture of forested and cleared grazing lands. The most significant feature was the presence of concrete foundation slabs, drainage works and road outlines remaining from the former Greta Army & Migrant camp. Additionally, several rusted 44-gallon drums were noted adjacent to the existing rail corridor.

2.7.9 Chainage 209.0-211.0 Kilometres

This segment began in the Cessnock LGA amongst grazing lands at the 209.0 kilometre chainage marker and extended north-west for 2 kilometres. The segment passed through forested and cleared grazing lands and residential areas of Greta. Given the low-lying nature of the adjacent lands, a large portion of the existing rail track along this segment had been raised with the addition of fill material. The presence of dumped car bodies and rusted 44-gallon drums were noted in the outskirts of the Greta township, whilst a soil stockpile was present to the south of the Nelson Street Overpass. The presence of deteriorated containers of potentially lead-based paints, stored motor oil containers, drums and car parts were noted at the residence immediately to the east of Greta Railway Station

2.7.10 Chainage 211.0-213.0 Kilometres

This segment began in the Cessnock LGA 200 metres north of the Greta Railway Station and extended north-west for 2 kilometres. The area was mainly forested on the south-west and cleared grazing lands on the northeast. A soil stockpile was present at 211.7 kilometres. Additionally, the track had been raised with the presence of fill at two locations along the north-west of the segment.

2.7.11 Chainage 213.0-215.0 Kilometres

This segment began in the Cessnock LGA amongst forested lands at the 213.0 kilometre chainage marker and extended northwest for 2 kilometres. The segment passed through forested and cleared grazing lands and residential outskirts of Branxton. The track has been raised with the presence of fill at one location and a 44-gallon drum was in an adjacent property at the same point. A vineyard was located on the southern side of the rail line between chainage 214.65 to 214.8 kilometres.

2.7.12 Chainage 215.0-217.0 Kilometres

This segment began in the Cessnock LGA slightly east of the Bridge Street overpass at Branxton and extended north-west into the Singleton LGA for 2 kilometres. The segment passed through forested and cleared grazing lands and residential areas of Branxton. A number of old 44-gallon drums and a smaller leaking drum partially filled with hydraulic oil were noted to the north of the track within the Branxton Station yards. A small emergency substation was present to the north-east of Branxton Station whilst a larger electrical substation was sighted outside the corridor in Fleet Street, Branxton. Additionally, fill materials were present on grazing lands to the west of the township.

2.7.13 Chainage 217.0-219.0 Kilometres

This segment began in the Singleton LGA amongst cleared grazing lands at the 217.0 kilometre chainage marker and extended west for 2 kilometres. The area was currently mainly cleared grazing lands with scattered houses and a single commercial property. The track had been raised with fill material significantly in the area adjacent to the Black Creek viaduct. A stockpile of electrical poles and a 44-gallon drum were noted west of Black Creek. The commercial property located adjacent to the Standen Drive was an engineering fabrication site which housed a number of 44-gallon oil drums and other industrial materials. To the west of this, fill material was noted under the rail track and on adjacent grazing lands, whilst another 44-gallon drum was located adjacent to the rail cutting.

2.7.14 Chainage 219.0-221.0 Kilometres

This segment began in the Singleton LGA amongst cleared grazing lands at the 219.0 kilometre chainage marker and extended south-west for 2 km. The segment passed through forested and cleared grazing and agricultural lands. An old 44-gallon drum was sighted along the eastern portion of the segment and the track has been raised in two sections with the use of fill materials. A vineyard was noted on the southern side of the rail line adjacent to Sweetwater Creek, however this is slightly outside the investigation area.

2.7.15 Chainage 221.0-223.0 Kilometres

This segment began in the Singleton LGA 350 metres north-west of the Bridge Street overpass at Belford and extends north-west for 2 kilometres. The land comprised scattered vegetation on the south-west and semi-cleared grazing lands on the north-east. The existing rail track had been raised with the addition of fill material at one location and an old 44-gallon drum was sighted to the north of the track near Branxton Street.

2.7.16 Chainage 223.0-224.220 Kilometres

This segment began in the Singleton LGA 300 metres west of Belford Railway Station overpass at Belford and extended south-west for 1.22 kilometres. The segment passed through cleared grazing and agricultural lands. The track had been raised with the use of fill materials in a number of locations. A vineyard was located on the south side of the existing track, however the vineyard was slightly outside the investigation area. A number of rusty 44-gallon drums were sighted to the north of the track adjacent to the end of the segment.

2.7.17 Former Hunter Distillery (206.05 to 206.20 Kilometres)

The Former Hunter Distillery property was rectangular in shape and relatively flat towards the west, sloping down to the east and the rail corridor. The site was primarily vegetated with thick grass ground cover and scattered trees to the south.

Treated timber logs were stockpiled in the south western corner of the site, just inside the entrance gate. Five depressions / wells were located on site. Two heavily overgrown depressions and one brick lined well/pit were located in the south western portion of the site. Two brick lined wells/pits were located in the central eastern portion of the site. The wells/pits were filled with metal waste such as barbed wire, reinforcing and drums. The furthest well/pit to the north was filled with timber at the surface. All depressions / pits contained water.

A fenced off area was noted along the eastern boundary of the site, adjacent to the rail corridor. Thick grass covered the area. Some block foundations were noted further north along the rail corridor.

Towards the centre of the site, there was a steep dip towards the east, effectively dividing the site into an elevated western portion and a lower eastern portion. This may have been cut to fill, however grass cover was too thick to determine surface materials.

Two access tracks were noted on site, along both the western and eastern boundaries running north / south.

To the north and west the site was bordered by rural residential/grazing land use. To the south the site was bordered by Allandale Road and rural residential/grazing land use. To the east of the site was the railway, Allandale Road and rural residential/grazing land use.

The closest water body was Anvil Creek, to the south over Allandale Road and to the east over the rail line.

2.7.18 Metal Fabrication and Engineering (217.90 to 218.05 Kilometres)

The site was rectangular in shape and sloped towards the south and south-east. The site was developed as a metal fabrication and engineering workshop and consists of a site office, main workshop and yard areas in the southern and western portions and a cleared area used for storage in the northern and eastern portions.

A car park had been excavated to the north of the office building with the materials placed in a screening mound between Standen Drive and the car park. Further to the north, across the access driveway, another area was being excavated in the same manner for additional car parking. All materials were cut from the site and used to build up the mounds.

The northern portion of the site was predominantly used for equipment and machinery storage and consisted of sand blasting shields, grates and grills, trucks and a boat. Metal framed and clad sheds storing other machinery and hoists were also in this area, adjacent to the dam.

The workshop located in the south-western portion of the site was used for metal fabrication and was open on the southern side. The yard area (to the south of the workshop) extended from the south western boundary, towards the east to an on-site dam, located on the central southern boundary. Further to the east of the dam, the site was grassed with scattered trees.

The yard consisted of storage racks for metal parts and machinery, metal framed and clad canopies, temporary storage of metal structures, metal scrap and machinery. Several forklifts were also used and stored on site. A bunded oil storage shed was located on the southern boundary as well as a flammable goods store containing paints and solvents. Gas cylinders were located in the south-western portion of the yard area and drums were noted stored within the racks along the western boundary of the site.

The surface of the yard area was extensively covered with sand blasting grit. Minor oil stains were also noted in the yard area. No fuels were kept on site and no refuelling of vehicles occurred on site. No underground or aboveground service tanks were observed.

The septic system servicing the site office and workshops was a pump out system. Stormwater was collected off roof surfaces and drained into three storage tanks located on the northern side of the workshop. Surface water runoff from the yard area was directed through a drainage system to the dam on the southern boundary.

To the north and west the site was bordered by rural residential/grazing land use. To the south the site was bordered by Allandale Road and rural residential/grazing land use. To the east of the site was the railway, Allandale Road and rural residential/grazing land use.

The closest water body was Anvil Creek to the south, over Allandale Road and to the east over the rail line.

2.7.19 Residential Properties on Wollombi Road (195.95 to 196.05 Kilometres)

This site consisted of two residential properties (eastern Lot and western Lot).

The eastern lot was triangular in shape and consisted of a brick residence located in the south-eastern corner and a granny flat/shed located in the central western corner. Another small shed was located in the south-western corner. The site was well landscaped with mature trees, ornamental gardens and vegetable patches. Vehicle access to the site was via an unsealed track running from Wollombi Road through to the rear (north) of the property along the railway corridor. The site was bounded to the north by the railway corridor and the south by Wollombi Road. A residential property bordered the site to the west and to the east was the unsealed access track and the railway corridor.

The western lot was rectangular in shape and consisted of a residence and several extensions and sheds along the western boundary and extended across the central portion of the site. An unsealed grassed and gravelled yard area and a pool were located in the southern portion of the site. A large unsealed gravelled yard area was located in the northern portion of the site. Vehicle access to the site was via an unsealed track running from Wollombi Road through to the rear (north) of the property along the railway corridor. The site was bordered to the north by the railway corridor and the south by Wollombi Road. A residential property bordered the site to the east and to the west was grazing land.

2.7.20 Truck Haulage on Wollombi Road (195.950 to 196.050 Kilometres)

The site was rectangular in shape and sloped towards the north. The site was developed as a residential property. A truck haulage business also operated from this site. The site consisted of a main brick residence, a self contained unit/site office and large metal clad shed. To the rear of the site was a gravelled vehicle parking and turning area and various fill mounds. At the far northern portion of the site was a disused quarry. The site then dropped steeply approximately 5m to the rail corridor.

The southern portion of the site comprised the brick residence and landscaped gardens. A pool was located to the north of the building. To the immediate east of the pool was the demountable office/granny flat and to the immediate north of the residence was the square metal clad shed. To the east of the shed were three bunded disused aboveground service tanks previously used for the storage of diesel fuel. Anecdotal information from the site owner indicated another diesel AST was located in this area but has since been removed. Two water tanks were located to the west of the shed.

An unsealed gravel driveway ran along the eastern boundary of the site from Wollombi Road to the north of the property. A gravelled open spaced vehicle parking and turning area was located in the northern portion of the site. Gravel stockpiles were located in the centre of this area with fill and rubbish (metal waste, household items) stockpiles on the northern portion of the turning area. These stockpiles were overgrown with weeds and grasses. Vehicle wash down occurred in this area.

In the far northern portion of the site, adjacent to the railway, was the large depression of a former quarry. This area was overgrown with weeds and grasses.

To the north the site was bordered by the railway. Further to the north are open space and residential areas. To the east of the site was grazing lands. Semi-rural residences bordered the site to the west and south.

2.8 Sources of Potential Contamination

The following areas of concern (AOCs), presented in Table 2-4, were identified on the basis of areas having a higher likelihood of potential contamination, based on the results of the desk-top review.

Table 2-4 Sources of Potential Contamination

Area of Concern	Description	Rationale / Details	Potential Contamination
Rural Properties	Grazing land adjacent to the corridor	Surface chemicals from spraying for weed and pest control Use of fertilisers	Total petroleum hydrocarbons (TPH) Polynuclear aromatic hydrocarbons (PAH) Heavy metals Organochlorine pesticides (OCP) Organophosphate pesticides (OPP)
Rail corridor	Access roads Embankments Storage areas Track construction	Importation of potential contaminated fill and ballast material Asbestos fibres from train brakes Surface chemicals from spraying for weed and pest control Spills of fuels, oils and greases Asbestos and lead paint residues from former and existing buildings Leaking of electrical transformers Illegal dumping	Total petroleum hydrocarbons (TPH) Benzene, toluene, ethyl benzene and xylene (BTEX) Polynuclear aromatic hydrocarbons (PAH) Heavy metals Asbestos Organochlorine pesticides (OCP) Organophosphate pesticides (OPP) Polychlorinated biphenyls **(**PCB)

Area of Concern	Description	Rationale / Details	Potential Contamination
Noise mound	North of corridor (196.6-197.4 km)	Importation of potential contaminated fill and ballast material	Total petroleum hydrocarbons (TPH) Benzene, toluene, ethyl benzene and xylene (BTEX) Polynuclear aromatic hydrocarbons (PAH) Heavy metals Asbestos
Stockpiles	Varied composition (194.38, 194.42, 195.10, 196.10, 196.14, 196.23, 196.24, 196.39, 196.40, 196.48, and 203.68 km)	Importation of potential contaminated fill and ballast material	Total petroleum hydrocarbons (TPH) Benzene, toluene, ethyl benzene and xylene (BTEX) Polynuclear aromatic hydrocarbons (PAH) Heavy metals Asbestos Organochlorine pesticides (OCP)

Area of Concern	Description	Rationale / Details	Potential Contamination
Heritage Sites	Former Greta Army and Migrant Camp (208.0-208.6 km) Former Hunter Distillery (206.05-206.20 km)	Importation of potential contaminated fill and ballast material Surface chemicals from spraying for weed and pest control Spills of fuels, oils and greases Asbestos and lead paint residues from former buildings	Total petroleum hydrocarbons (TPH) Benzene, toluene, ethyl benzene and xylene (BTEX) Polynuclear aromatic hydrocarbons (PAH) Phenols Heavy metals Asbestos Organochlorine pesticides (OCP)
Vineyards	South of the corridor (214.65-214.80 and 222.90-223.50 km)	Surface chemicals from spraying for weed and pest control Use of fertilisers	Heavy Metals Organochlorine pesticides (OCP) Organophosphate pesticides (OPP)
Industrial properties	Metal Fabrication and Engineering on Standen Drive (217.80-218.00 km) Truck Haulage on Wollombi Road (196.00 km) Energy Australia Depot on Wollombi Road (195.30-195.45 km)	Importation of potential contaminated fill and ballast material Surface chemicals from spraying for weed and pest control Spills of fuels, oils and greases Asbestos and lead paint residues from former buildings Illegal dumping of potentially contaminated waste	Total petroleum hydrocarbons (TPH) Benzene, toluene, ethyl benzene and xylene (BTEX) Polynuclear aromatic hydrocarbons (PAH) Heavy metals Asbestos Organochlorine pesticides (OCP) Organophosphate pesticides (OPP)

Area of Concern	Description	Rationale / Details	Potential Contamination
Acid sulfate soils	40 m south of the railway (195.490 -195.510 km)	Potential for acidification, and mobilisation of heavy metals, if disturbed	pH Heavy metals ASS/PASS

3. Legislation and Guidelines

3.1 Relevant Guidelines

All investigations were undertaken with reference to the relevant EPA guidelines including:

- *National Environment Protection Measure (Assessment of Site Contamination)* (NEPC, 1999).
- *Contaminated Sites: Guidelines for Assessing Service Station Sites* (NSW EPA, 1994).
- *Contaminated Sites: Sampling Design Guidelines* (NSW EPA, 1995).
- *Guidelines for Consultants Reporting on Contaminated Sites* (NSW EPA, 1997).
- *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (2nd edition)*, (DEC 2006).

The guidelines used to assess the soil contamination status of the investigation area included:

- *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (2nd edition)*, (DEC 2006).
- *Contaminated Sites: Guidelines for Assessing Service Station Sites* (NSW EPA, 1994).
- Australian New Zealand Environmental Conservation Council *(ANZECC)/National Health and Medical Research Council* (NHMRC) (1992) "*Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites*".
- National Environmental Protection Council (NEPC) (1999) "*National Environmental Protection (Assessment of Site Contamination) Measure 1999*", (NEPM).
- NSW DECC (2009*) Waste Classification Guidelines, Part 1: Classifying Waste* (NSW DECC 2009).

3.2 Soil Investigation Thresholds

The National Environment Protection Measure (NEPM) includes a range of Soil Investigation Levels including Ecological Investigation Levels (EILs) largely similar to the Environmental Investigation Thresholds (EITs) listed in the *Australian and New Zealand Guidelines for The Assessment and Management of Contaminated Sites* (ANZECC/NHMRC 1992). Health Investigation Levels (HILs) listed in the NEPM are generally the same as the Health-based Soil Investigation Levels (HBSILs) listed in the Guidelines for the *NSW Site Auditor Scheme (NSW EPA, 1998*).

Essentially, both EILs and HILs are default values designed to protect the environmental and human receptors respectively. ANZECC/NHMRC recommends that generally where EITs are exceeded, an investigation should take place, but it is stressed that the values are intended as a guide only and site specific factors need to be taken into account when assessing data. It is stated that "in general terms the guideline values will protect the most sensitive receptor", and of the receptors considered, the most sensitive and hence, most stringent guidelines are for the protection of plant life.

The NEPM also uses the ANZECC/NHMRC (1992) definition of Environmental Investigation Level as the concentration above which further appropriate investigation and evaluation will be required. The EILs are based on consideration of phytotoxicity and soil survey data, and

supported by the “ANZECC B” EITs (Environmental Investigation Thresholds). It is acknowledged that future ecologically based guidelines will be developed at regional level and related to land use, and that specific circumstances may warrant the use of more pertinent regional values.

The basis on which the HILs (or HBSILs) have been set should be assessed for relevance to the situation under consideration. HILs are provided for a range of different exposure settings or land uses:

- “A” Standard Residential with garden/accessible soil (includes children day-care centres, kindergartens, pre-schools and primary schools).
- “D” Residential with minimal opportunities for soil access.
- “E” Parks, recreational open space and playing fields (including secondary schools).
- “F” Commercial/industrial (includes shops, offices, factories and industrial sites).

Based on the proposed site usage as rail corridor and roadway construction, Hunter 8 considers that the most appropriate investigation level for this assessment is Commercial/Industrial (Setting “F”).

It is stated in the NEPM [Schedule B(7a)] that the HILs provide “a trigger to assist in judging whether a detailed investigation of a site is necessary”. It is also stated “the levels should not be interpreted rigidly” and “the proposed land use, distribution of contaminants and the frequency distribution of elevated levels will all be very important in interpreting the results for a site”. Separate health and environmental investigation levels have been established to take into account the different sensitivities of humans and other components of the environment. The HILs are typically higher than, or in rare cases (eg lead) equal to or less than, the EILs. Site specific decisions need to be made to determine whether health or environmental levels (or both) should apply.

The NEPM guidelines are restricted to non-volatile and semi-volatile substances and do not include all the potential contaminants that may be at the investigation area (such a volatile substances). Therefore, for substances not included in these guidelines (such as TPH and BTEX), criteria from the NSW EPA (1994) Guidelines for Assessing Service Station Sites have been used.

The methodology used when assessing contamination levels in soils at the investigation area was to use the EILs and HILs as a cut off point to classify soils either as:

- Soils not contaminated, which pose no risk to the environment or human health and warrant no further action, i.e. concentrations less than or equal to the EILs.
- Soils containing elevated concentrations of contaminants, which may pose a risk to the environment (in particular plant species) but pose no risk to human health under the proposed land use scenario, ie. concentrations greater than the EILs and less than the HILs. Due to the purpose of this assessment and the proposed land use these soils will generally not warrant further action but will be highlighted giving consideration to environmental risks and proposed land use.

- Soils significantly contaminated which pose a risk to both the environment and human health, ie. concentrations greater than or equal to the HILs. Soils in this category would likely require remediation or management to permit the proposed land use, or would require a Site Specific, Risk Based Assessment to further determine potential risk to human health and the environment.

The methodology used to develop Ecological Investigation Levels (EILs) and Health Investigation Levels (HILs) for this Site was in accordance with EPA recommendations and comprised the following (in order of preference):

Ecological Investigation/Threshold Concentration (EIL or TC)

- NEPC (1999) NEPM Schedule B(1), Ecological Investigation Levels.
- NSW EPA (1998) Guidelines for the NSW Site Auditor Scheme, Provisional Phytotoxicity – Based investigation Levels.
- ANZECC (1992), Guidelines for the Assessment and Management of Contaminated Sites, Environmental Investigation Thresholds.
- NSW EPA (1994) Guidelines for Assessing Service Station Sites, Threshold Concentrations for Sensitive Land Use, protection of terrestrial organisms.

Health Investigation Levels/Threshold Concentration (HIL or TC)

- NEPC (1999) NEPM Schedule B(1), Health Investigation Levels, Exposure Setting F: Commercial/Industrial.
- NSW DEC (2006) Guidelines for the NSW Site Auditor Scheme incorporating the National Environmental Health Forum (1996), Soil Series No. 1, Health Based Soil Investigation Levels, Exposure Setting F: Commercial/Industrial.
- NSW EPA (1994) Guidelines for Assessing Service Station Sites, Threshold Concentrations for Sensitive Land Use, human health based protection levels.

Table 3-1 provides a summary of the investigation levels that were used to assess soil contamination levels.

Table 3-1 Soil Assessment Criteria

Parameter	Environmental Criteria (EIL [(a)] or TC)	Commercial/ Industrial Health-Based Criteria (HIL F[(f)] or TC)
Arsenic	20	500
Cadmium	3	100
Chromium	50[(b)]	500[(c)]
Copper	100	5000
Lead	600	1500
Nickel	60	3000

Parameter	Environmental Criteria (EIL [a] or TC)	Commercial/ Industrial Health-Based Criteria (HIL F[f] or TC)
Zinc	200	35000
Mercury	1	75
TPH		
C_6-C_9	-	65[e]
C_{10}-C_{36}	-	1000[e]
Benzene	1[e][g]	1[e][g]
Toluene	1.4[e][h]	130[e]
Ethyl Benzene	3.1[e][h]	50[e]
Xylene	14[e][h]	25[e]
PAHs (total)	-	100
Benzo(a)pyrene	-	5
PCBs (Total)	1[d]	50
Dieldrin	0.2[d]	-
Aldrin+Dieldrin	-	50
Chlordane	-	250
DDT+DDD+DDE	-	1000
Heptachlor	-	50
Asbestos	N/A	No asbestos in surface soils [i]

Note: All units in mg/kg unless otherwise noted.

a) NEPC (1999) NEPM Schedule B(1), Ecological Investigation Levels.

b) Australian and New Zealand Environment and Conservation Council (1992), Guidelines for the Assessment and Management of Contaminated Sites, Environmental Investigation Thresholds Level where valance state is not distinguished but expected to be Cr(III). NEPM EIL for Cr(III) is 400 mg/kg.

c) NEPC (1999) HIL F, Based on Cr(VI).

d) Australian and New Zealand Environment and Conservation Council (1992), Guidelines for the Assessment and Management of Contaminated Sites, Environmental Investigation Thresholds.

e) From NSW EPA (1994) Guidelines for Assessing Service Station Sites, Threshold Concentration for Sensitive Land Use.

f) NEPC (1999) NEPM Schedule B(1), Health Investigation Levels, Exposure Setting F:Commercial/industrial.

g) From NSW EPA (1994) Guidelines for Assessing Service Station Sites, Threshold Concentration for Sensitive Land Use. A lower benzene concentration may be needed to protect groundwater.

h) From NSW EPA (1994) Guidelines for Assessing Service Station Sites, Netherlands MPC to protect terrestrial organisms in soil.

i) EPA Advice to Auditors, 31 March 2000. The DEC (2006) Guidelines for the NSW Site Auditor Scheme now states that there are no current national or DEC-endorsed guidelines relating to human health or environmental investigation of material containing asbestos on sites, and previous advice has specifically been rescinded.

3.3 Waste Classification Criteria

Material disposed of from the investigation area requires classification for disposal purposes, in accordance with the Protection of the Environmental Operations Amendment (Scheduled Activities and Waste) Regulation, 2009. Criteria from the Waste Classification Guidelines, Part 1: Classifying Waste (NSW DECC 2009) are shown in Table 3-2 below for the potential contaminants most likely to be present at the Site.

Table 3-2 Waste Classification Criteria

Parameter	Maximum Total Concentration (mg/kg) for Classification Without TCLP		Maximum Values for Leachable Concentration (TCLP – mg/L) and Total Concentration (SCC – mg/kg) When Used Together			
	General Solid Waste	Restricted Solid Waste	General Solid Waste		Restricted Solid Waste	
	CT 1	CT 2	TCLP 1	SCC 1	TCLP 3	SCC 3
Benzene	10	40	0.5	18	2	72
Ethylbenzene	600	2400	30	1080	120	4320
Toluene	288	1152	14.4	518	57.6	2073
Xylenes (total)	1000	4000	50	1800	200	7200
Benzo(a)pyrene	0.8	3.2	0.04	10	0.16	23
PAHs	NA	NA	NA	200	NA	800
TPH C_6-C_9	NA	NA	NA	650	NA	2600
TPH C_{10}-C_{36}	NA	NA	NA	10000	NA	40000
PCB	NA	NA	NA	<50	NA	<50
Scheduled Chemicals[3]	NA	NA	NA	<50	NA	<50
Arsenic	100	400	5	500	20	2000
Cadmium	20	80	1	100	4	400
Chromium	100	400	5	1900	20	7600
Copper	NA	NA	NA	NA	NA	N A
Lead	100	400	5	1500	20	6000

Mercury	4	16	0.2	50	0.8	200
Nickel	40	160	2	1050	8	4200
Zinc	NA	NA	NA	NA	NA	NA

Notes: CT: Contaminant Threshold

TCLP Toxicity Characteristic Leaching Procedure (leachable concentration).

SCC Specific Contaminant Concentration.

NA: Indicates no guidelines for that particular analyte are currently applicable.

1. Scheduled chemicals, polycyclic aromatic hydrocarbons and polychlorinated biphenyls are assessed by using SCC1, SCC2 and SCC3. No TCLP analysis is required.
2. *Petroleum hydrocarbons are assessed only by total concentration (SCC1, SCC2 or SCC3).*
3. Scheduled Chemicals includes those chemicals as described in *DECC 2009*, being chlorinated hydrocarbons (example, pesticides and solvents).

4. Methodology

4.1 Sampling and Analysis Plan and Methodology

4.1.1 Data Quality Objectives

The Data Quality Objectives (DQOs) for the investigation were to:

- Collect sufficient information to adequately characterise areas of environmental concern.
- Assess the nature and extent of contamination in the soils at the investigation area.
- Assess any potential contaminant risks to human health and the environment within the context of the investigation area.
- Establish an acceptable level of uncertainty in analytical results that fall within EPA guidelines for accuracy and precision (as demonstrated by field and laboratory Quality Control). The representativeness of sample locations with respect to investigation areas conditions was assessed against field observations and distribution of data, using the number of sampling locations described above.
- Produce a report describing the methodology and findings of the investigations, and addressing the above investigations.

4.1.2 Rationale for Sampling and Analysis Plan

Hunter 8's approach to the contamination assessment of the investigation area was to conduct a preliminary site contamination investigation with limited soil sampling to establish past site usage and to identify any contamination issues associated with the investigation area.

The limited sampling and analytical program was based on knowledge of the investigation area current at the time of undertaking the desktop review and site inspection. As a result, several sample locations are located outside of the construction impact zone. These samples have been included in this report based on their proximity to the site or selected as representative locations where site access was limited.

A targeted sampling pattern was applied for this investigation, based on the AOCs identified in the desk-top review and site inspections, summarised in Table 2-4.

The rural properties identified as AOCs have not been sampled due to a low likelihood of contamination, based on the low intensity of agricultural use and previous similar investigations performed by Hunter 8.

Acid sulfate soils were also identified as an AOC but not targeted as part of this investigation due to the low likelihood of disturbance.

Due to access restrictions and the presence of underground utilities under or near the access road, no sampling was undertaken within the vicinity of the rail line.

Several AOCs were unable to be sampled due to limited access at the time of investigation. These properties include:

- Former Hunter Distillery.
- Metal fabrication and engineering on Standen Drive.
- Truck haulage on Wollombi Road.
- Energy Australia Depot on Wollombi Road.

The sampling program undertaken was considered sufficient to provide an indication as to the potential contamination likely to be encountered within the investigation area, with the exception of the AOCs identified above. However the sampling density is not considered sufficient to delineate areas of contamination identified or provide sufficient information to characterise material for off-site disposal. In addition, areas of unknown potential contamination may exist on the investigation area, not identified during this limited investigation.

Sampling locations are presented in Figures 2 to 10 in Appendix B.

4.1.3 Field Works

Field works and environmental sampling were undertaken by experienced Hunter 8 personnel on 24-27 August 2009. All fieldwork was undertaken in accordance with standard field operating procedures. All sampling was conducted using carefully documented and supervised quality assurance procedures.

Field works included:

- Collection of three surface samples.
- Excavation of 55 test pits using an excavator to a maximum depth of 1.6 metres.
- Collection of 129 soil samples including the three surface samples mentioned above.

4.1.4 Soil Sampling Methodology

Soil samples were collected from the ground surface and from tests pits excavated using an excavator. The test pits were excavated 0.2 to 0.3 metres into the underlying natural soils.

Samples were generally collected at surface (0.0 to 0.1 metres), subsurface (0.5 metres), and at the base of the pit (0.2 to 0.3 metres below top of natural soils). Samples were collected from the side of the excavation after removing the potentially cross contaminated surface layer, or from the middle of the bucket using a dedicated pair of disposable nitrile gloves for each sample.

All test pits completed during the investigations were logged detailing features such as seepage, discolouration, staining, odours and other indications of contamination being noted. A soil description register is presented in Table A, Appendix E.

4.1.5 Sample Handling

Samples were collected in appropriate sample containers, which had been pre-treated in a manner appropriate for the laboratory analysis. Samples were placed in the jars supplied by the laboratory, clearly labelled with sample number, sample location, sample depth and sample date. Sample containers were then transferred to a chilled esky for sample preservation prior to and during shipment to the testing laboratory. A Chain-of-Custody form was forwarded with the samples to the testing laboratory and is presented with the laboratory analytical certificates in Appendix D.

4.1.6 QA / QC

Intra laboratory and inter laboratory duplicates were collected for Quality Control purposes at a nominal rate of 1 in 10 and 1 in 20 samples respectively.

4.1.7 Laboratory Analytical Program

Laboratory analysis was undertaken using the following National Association of Testing Laboratories (NATA) accredited laboratories:

- Primary laboratory: ALS Laboratory Group (ALS), NATA Accredited Laboratory 825.
- Secondary Laboratory: Labmark Environmental Laboratories (Labmark), NATA Accredited Laboratory 13542.

Details of the number of sample locations, parameters and analyses are summarised in Table 4-1.

Table 4-1 Analytical Program

Area of Concern Targeted	Number of Sample Locations	Analytical Parameters	Number of Analyses
Rural properties	No samples due to low likelihood of contamination	-	-
Rail corridor	18	TPH	18
		BTEX	18
		PAHs	18
		Heavy Metals[1]	18
		OCPs	18
Noise mounds	9	TPH	9
		BTEX	9
		PAHs	9
		Heavy Metals[1]	9
		OCPs	9

Area of Concern Targeted	Number of Sample Locations	Analytical Parameters	Number of Analyses
Stockpiles	10	TPH	14
		BTEX	14
		PAHs	14
		Heavy Metals[1]	14
		OCPs	11
Heritage Sites	5 (Former Greta Army and Migrant Camp only)	TPH	5
		BTEX	5
		PAHs	5
		Heavy Metals[1]	5
		Nutrients	5
Vineyards	11	Heavy Metals[1]	11
		OCPs	4
Industrial properties	No samples due to limited access	-	-
Acid sulfate soils	No samples due to low likelihood	-	-

1. Metals included As, Cd, Cr, Cu, Hg, Pb, Ni, and Zn.

2. OPPs have not been included in the sampling and analysis plan due to their short life-span in the environment.

4.2 Quality Assurance / Quality Control

4.2.1 Field Quality Assurance (QA)

All fieldwork was conducted in general accordance with the Standard Field Operating Procedures (FOP). The FOP ensures that all environmental samples were collected by a set of uniform and systematic methods.

The FOP describes many field activities including:

- Implemented decontamination procedures.
- Sample identification procedures.
- Information requirements for soil bore logs.
- Chain of custody information requirements.
- Sample duplicate frequency.
- Field equipment calibration requirements.

4.2.2 Field Quality Control (QC)

Field quality control procedures used during the project comprised:

- **Intra-Laboratory Duplicates:** These are prepared in the field by splitting the original sample and placing two equivalent portions of samples into two separate containers. The blind duplicate sample is sent anonymously to the project laboratory. Duplicate samples are analysed for the identical set of parameters requested for the corresponding original sample. For the intra-laboratory duplicate sample pair, relative percentage differences (RPD) are calculated. Intra-laboratory duplicates provide an indication of the analytical precision of the project laboratory, but may also be affected by factors such as sampling methodology or inherent heterogeneity of the sample medium.
- **Inter-laboratory Duplicates:** These are prepared in the field by duplicating the original sample and placing two equivalent portions of samples taken consecutively into two separate containers. The inter-laboratory duplicate sample was sent to the check laboratory, while the original sample is sent to the primary laboratory. The inter-laboratory sample is analysed for the identical set of parameters requested for the corresponding original sample. For the inter-laboratory duplicate sample pair, RPD are calculated. Inter-laboratory duplicates provide an indication of the analytical accuracy of the project laboratory, but may also be affected by factors such as sampling methodology or inherent heterogeneity of the sample medium.

Trip spikes were not used for field quality control as it was assumed that there is a low likelihood of volatile contaminants on this investigation area. The results of the PID screening as presented in Table A, Appendix E, supported this assumption.

Field blank samples are generally collected to validate decontamination procedures for sampling equipment between sampling locations. Due to the method of sampling that was used for this investigation the use of field blank samples was not required.

Assessment of field quality control duplicate samples was undertaken by calculating the Relative Percent Difference (RPD) of duplicate samples. RPD is defined as:

$$RPD(\%) = \frac{|C_o - C_d|}{C_o + C_d} \times 200$$

Where: Co = Analyte concentration of the original sample

Cd = Analyte concentration of the duplicate sample

AS 4482.1 states that this RPD should be within 30% - 50% of the mean concentration of the analyte, noting that this variation may be higher for organics, or for cases where analyte concentrations are low. This is consistent with quality control objectives described in the NEPM. A result exceeding these guidelines does not necessarily mean the data is invalid, but rather the impact on the data may need to be assessed. AS 4482.1 notes that the significance of RPD of results should be evaluated on the basis of sampling technique, sample variability, absolute concentrations relative to criteria and laboratory performance.

4.2.3 Laboratory Quality Assurance

The analytical laboratories undertook the analyses utilising their own internal procedures and test methods (for which they are NATA accredited) and in accordance with their own quality assurance system which forms part of their NATA accreditation.

4.2.4 Laboratory Quality Control

Laboratory quality control procedures used during the project and reported comprised:

Laboratory Duplicate Samples: Analysis of duplicate sub-samples from one sample submitted for analytical testing and analysis of the samples in the one batch. A laboratory duplicate provides data on the analytical precision (repeatability) of an analytical batch.

Spiked Samples: A sample is spiked by adding an aliquot of known concentration of the target analyte(s) to the sample matrix prior to sample extraction and analysis. A spike documents the effect of the sample matrix on the extraction and analytical techniques.

Laboratory Blank: Usually an organic or aqueous solution that is as free of analyte as possible and contains all the reagents in the same volume as used in the processing of the samples. The reagent blank must be carried through the complete sample preparation procedure and contains the same reagent concentrations in the final solution as in the sample solution used for analysis. The reagent blank is used to correct for possible contamination resulting from the preparation or processing of the sample.

Other internal laboratory quality control procedures, as required for NATA registration, are performed and are not reported by the laboratories. These procedures and results can be provided on request.

5. Summary of Results

5.1 Investigation Results

5.1.1 Soil Profile

The typical soils encountered within the corridor during sampling were fill materials - consisting of ballast, silt, sand, and clay – many of which contained displaced natural materials. These were underlain by natural clay. Typical soils encountered adjacent to or within rural properties consisted of natural clays. A detailed soil register is presented in Table A, Appendix E.

5.1.2 PID Results

Soil samples were subjected to PID (Photo-Ionisation Device) headspace screening during the investigation. PID readings were generally less than 0 ppm, with the exception of SLTP 009 (18.1 to 25.6 ppm) and SLTP 011 (2.1 to 3.1 ppm) No hydrocarbon odours or staining were noted during the investigation, nor were any other indications of soil contamination apparent.

5.1.3 Soil Analytical Results

Soil sample locations are presented in Figures 2 to 10, Appendix B. Summaries of the laboratory results are presented in Tables B to D, in Appendix E. Table A in Appendix E presents a summary of the samples analysed. Detailed laboratory report sheets and COC (Chain of Custody) documents are provided in Appendix D.

In documenting these results, comparison has been made to the site assessment criteria, including Ecological Investigation Levels (EILs) and Health Investigation Levels (HILs) for commercial / industrial land use as discussed in Section 3.2.

Heavy metals

Concentrations of heavy metals in all samples analysed were below the relevant HILs, however the following samples exceeded the EILs:

- Arsenic - SP-W DB1, SP-W196.100, SP-W196.240, SP-W196.390, SP-W196.400, TP214.77 0.0M, TP215.48 0.0M, TP215.62 0.0M, TP215.71 0.5M, TP215.82 0.0M, and TP215.91 0.0M (ranged from 21 to 193 mg/kg).
- Total Chromium - SL-B215.050, SLTP 010-0.0, TP197.30 0.5M, TP197.54 0.0M, TP197.58 0.0M, and TP215.62 0.0M (ranged from 58 to 189 mg/kg).
- Copper - TP208.17 0.0M (149 mg/kg).
- Nickel - SP-T195.100 (92 mg/kg).

There was no indication of plant stress or die-back at these locations.

Organochlorine Pesticides (OCPs)

Concentrations of OCPs in all samples analysed for these parameters were below the laboratory limit of reporting.

Polyaromatic Hydrocarbons (PAH's)

Concentrations of Total PAHs and Benzo[a]Pyrene were below the laboratory limit of reporting in all samples analysed, except for SLTP 012-0.0, SP-W PB1, TP197.10 0.0M, TP208.17 0.0M, TP215.56 0.0M, TP215.82 0.0M and TP215.91 0.0M which had minor detections for: Benz(a)anthracene , Benzo(a) pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Chrysene, Fluoranthene, Phenanthrene and Pyrene.

Total Petroleum Hydrocarbons (TPH C_{10} - C_{36})

Detectable levels of TPH in the C_{10} - C_{36} were reported for samples SLTP 008-0.3, SLTP 011-0.0, TP196.80 0.0M, TP197.58 0.0M, TP215.62 0.0M, TP215.82 0.0M, TP215.91 0.0M and TP216.02 0.5M. These samples were reported below the threshold criteria guidelines and some that had a duplicate, had a result that was below the laboratory limit of reporting. All remaining samples reported concentrations of TPH C_{10}-C_{36} below the laboratory limit of reporting.

Volatile Hydrocarbons (TPH C_6 - C_9 and BTEX)

Concentrations of TPH in the C_6 - C_9 range and BTEX in all samples analysed were below the laboratory limit of reporting.

Asbestos

There were no asbestos mineral fibres detected in SLTP 010-0.0. This sample was analysed based on subsequent anecdotal evidence that a nearby ballast stockpile contained asbestos, however this was unable to be verified at the time of the investigation. There were no fragments of potential asbestos containing material observed during the investigation.

5.2 Preliminary Waste Classification

The indicative waste classification based on the results to date indicates that soils would generally be classified as General Solid Waste. However, several samples exceeded the General Solid Waste guidelines without TCLP analysis, including:

- Arsenic – TP215.48 0.0M (193 mg/kg).
- Chromium – TP197.58 0.0M (189 mg/kg) and TP215.62 0.0M (173 mg/kg).
- Lead – TP215.71 0.5M (282 mg/kg) and TP215.82 0.0M (122 mg/kg).
- Nickel – SP-T195.100 (92 mg/kg).

These results are indicative only, based on the insitu sampling undertaken and on the total concentrations of constituents. Incorporation of TCLP analysis for the above samples is likely to result in a reduction in waste classification to General Solid Waste.

5.3 Quality Assurance / Quality Control

5.3.1 Field Duplicates

Relative Percent Differences (RPDs) were calculated for duplicated samples as part of the QA / QC program, and are presented in Tables B to D in Appendix E. The results are discussed below.

The RPDs for soil sample pairs were generally within 30 percent, with the exception of those highlighted in Table 5-1.

Table 5-1 RPD Exceedances Summary

Primary/Duplicate	Parameters > 30%	Comment
SLTP 011-0.0 / SLTP 011-QA01	Arsenic (33%)	Elevated RPD due to low concentration of analyte (less than 10 times the limit of reporting
SP-W 196.10 / SP-W-QA01	Copper (31%)	Elevated RPD due to low concentration of analyte (less than 10 times the limit of reporting
TP197.30 0.5M / TPQA09	Moisture (84%)	Elevated RPD due to soil heterogeneity
TP197.30 0.5M / TPQA09	Copper (40%), Lead (36%), Nickel (46%), Zinc (36%)	Elevated RPD due to low concentration of analyte (less than 10 times the limit of reporting
TP197.55 0.0M / TPQA07	Arsenic (57%), Chromium (72%), Copper (40%), Lead (47%), Nickel (46%), Zinc (47%)	Elevated RPD due to low concentration of analyte (less than 10 times the limit of reporting
TP216.02 0.5M / TPQA02	Arsenic (86%), Chromium (33%), Lead (40%), Zinc (40%)	Elevated RPD due to low concentration of analyte (less than 10 times the limit of reporting, intra-laboratory duplicate had no elevated RPDs

5.3.2 Laboratory QA/QC

The NATA certified laboratory results sheets, as presented in Appendix D, refer to a quality control program comprising the analysis of spikes, method blanks and duplicate samples. Generally, the results reported indicate that the laboratory was achieving levels of performance within their recommended control limits during the period when the samples from this program were analysed, with the exception of minor recovery exceedances. These were not considered to affect the results as all recorded concentrations were reported below or slightly above the laboratory limit of reporting, which were well below the adopted assessment criteria.

5.3.3 Assessment of QC Results

The quality assurance and quality control measures employed throughout this assessment have enabled the quality of the field sample collection and laboratory analysis procedures to be examined. Based on the RPDs calculated for the field split duplicates, the results and precision of the data is considered to be of an acceptable quality upon which to draw conclusions regarding the environmental condition of the investigation area. There is some variability in results, which is primarily attributed to the low concentration of analytes which has been taken into account in the assessment of results. As analytical results were generally well below relevant criteria, the variability evident from the quality control samples is not considered to affect the assessment.

6. Impact Assessment

6.1 Environmental Risk Assessment

A qualitative Environmental Risk and Impact Assessment (Risk Assessment) has been conducted as part of the Environmental Assessment process to evaluate the potential impacts that the Project could have on a wide range of environmental, social and economic assets and beneficial uses. This risk assessment process has contributed to the conclusions of this study.

In summary, The Risk Assessment:

- Identify the potential environmental, social and economic impacts on the wider environment and community of implementing the Project, and to heighten confidence and provide rigour for decision making and planning.
- Based on the Description of the Project included in the Environmental Assessment and the outputs of the risk assessment represent the risk and impacts of implementing the Project as described in the Description of the Project.
- Was conducted in close consultation with all of the technical specialists and is based on input provided by those technical specialists. All of the Risk Assessment inputs including consequence and likelihood ratings were provided by the technical specialists.
- The Risk Assessment incorporates the outputs of the Community Consultation which occurred as part of the Environmental Assessment, although separate to the risk assessment process. The values and outcomes of the community consultation were incorporated to inform the risk assessment process.
- Used a multi-disciplinary group of technical specialists to assess the consequence and likelihood of the identified risks. To assess risks consistently, consequence tables were developed that clearly define levels of consequence, from insignificant to catastrophic, in terms of magnitude, space and time. Consequence, having regard to 'reasonable worst-case scenarios' (considering activity controls), and the likelihood of that consequence occurring are defined for all identified risks and impacts, allowing risks to be ranked. The consequence table relevant to this study and the likelihood descriptions are provided in Appendix A. The consequence tables used for estimating diverse consequence types on an even basis were developed specifically for the Project based on consultation and advice from the technical specialists. The likelihood table was developed to incorporate the scoping requirements concept of predicted and potential risks and impacts. The scale ranges from rare to almost certain.
- The risk ranking was calculated via the risk matrix, considering both consequence and likelihood allocations.

The risk matrix and the risk outputs relevant to this report are both presented in Appendix A.

Provided the planned controls to manage risk are implemented, there are no risk pathways identified as posing an extreme, high or medium risk in the Risk Assessment in relation to site contamination issues.

6.2 Contamination Assessment

6.2.1 General Site Identification

The historical review indicated that the Great Northern Railway has been present since the late 1860s. The areas surrounding the rail corridor are likely to have been used for residential/rural land use from 1909 to present day. No records relating to specific contamination or remediation were identified within the DECCW contaminated land register.

A review of the Department of Land and Water Conservation acid sulfate soil risk maps indicated there was only one small area of risk, classified as high probability of occurrence of acid sulfate soil materials within 1 metre of the ground surface. This area was located just within the investigation area, 40 metres south of the railway, between chainage 195.490 - 195.510. It is unlikely that this area will be disturbed by the Project, however if disturbed this could pose a significant localised environmental risk.

Based on the historical review and site inspection, the most likely sources of contamination within the investigation were considered to be the following:

- Spraying for weed and pest control.
- Use of fertilisers on rural land and vineyards.
- Surface fills including ballast.
- Use and storage of fuels, oils and greases.
- Asbestos fibres from train brakes.
- Asbestos and lead paint residues from former and existing buildings and structures.
- Electrical transformers (former substation at Branxton Station).
- Acid sulfate soils.

6.2.2 Summary of Results

Sampling was undertaken at 58 locations in the investigation area.

The typical soils encountered within the corridor during sampling were fill materials – consisting of ballast, silt, sand, and clay – many of which contained displaced natural materials. These were underlain with natural clay. Typical soils encountered adjacent to or within rural properties consisted of natural clays.

There were no exceedances of the nominate land use criteria, HIL F or TC, for the samples analysed, however several samples analysed exceeded the EILs. Arsenic in eleven primary samples and one duplicate (approximately 17% of samples analysed) exceeded the EIL by up to an order of magnitude. Chromium concentrations in six samples exceeded the ANZECC (1992) EIT for chromium, but if present as trivalent chromium (which is likely to be the case), all concentrations were less than the NEPC (1999) EIL of 400 mg/kg. Only one copper and one nickel concentration exceeded the EILs, and were of similar magnitude as the EILs. While concentrations exceeding EILs may indicate some potential environmental impacts the “decision-making process for assessing urban redevelopment sites” from DEC 2006 does not require consideration of EILs when assessing the suitability of a site for commercial / industrial

land use such as rail corridor and roads. Samples exceeding the EILs may present an ecological risk, but are not considered to restrict construction activities.

These exceedences should be considered when determining potential re-use of excavated material along the route, particularly with respect to contamination of adjacent areas and waterways, but given the concentrations found, are unlikely to present a risk of significant impacts.

6.2.3 Preliminary Waste Classification

The indicative waste classification based on the results to date indicates that soils would generally be classified as General Solid Waste. However, several samples exceeded the General Solid Waste guidelines without TCLP analysis. These results are indicative only, based on the insitu sampling undertaken and on the total concentrations of constituents. Incorporation of TCLP analysis is likely to result in a reduction in waste classification to General Solid waste for the samples that exceeded the threshold on the basis of total concentrations.

6.3 Discussion

A hazardous materials survey was not carried out as part of this investigation, however no potential asbestos material fragments were noted on or in the soil at the time of sampling. It is recommended that a hazardous materials assessment be carried out on any signal huts or structures scheduled for removal.

The extent of sampling of soils and subsequent analysis has been necessarily limited, and has been targeted towards areas where contamination is considered to be most likely, based on the knowledge of the site history and visual observation. The sampling density (sparse) is not considered sufficient to delineate areas of contamination identified or provide sufficient information to characterise material for off-site disposal. However given that there is little evidence of impacts, a greater level of investigation is not considered necessary (except AOCs that could not be accessed as identified in Section 4.1.2). It is recommended that management procedures be used to be alert for any unexpected contamination that could be encountered during works, in case this occurs.

7. Mitigation Measures

The following recommendations are in response to the environmental risk assessment as outlined in Section 6.1 and presented in Appendix A. The mitigation measures for the Project, in regard to contamination, include:

- Undertake Phase 2 Contamination Assessments in identified areas of concern likely to contain contaminants, where limited access has prevented investigation to date. This comprises the metal fabrication and engineering property on Standen Drive, Energy Australia Depot on Wollombi Road, truck haulage property on Wollombi Road, and Former Hunter Distillery property.
- Develop and implement a Spoil and Fill Management Plan (SFMP) as part of the Construction Environmental Management Plan (CEMP) for managing possible contaminated materials not encountered and assessed during this investigation. The SFMP for the proposed works should detail appropriate procedures for the handling, stockpiling and assessing potentially contaminated materials during the works. The SFMP should also include a contingency plan for unexpected hazards that may be encountered during site works.
- Manage waste in accordance with relevant legislation.
- Implementation of Asbestos Management Plan as part of the CEMP, including procedures for management and disposal should asbestos be identified. Should any signal huts or structures within the site area be scheduled for removal, it is recommended that a hazardous material survey be undertaken prior to demolition.
- Implementation of an Acid Sulfate Soil Management Plan as part of the CEMP.

8. Conclusions

Hunter 8 Alliance undertook a preliminary site contamination investigation with limited soil sampling with respect to the proposed Minimbah to Maitland Third Track Project, to assess the likely potential for contamination within the investigation area.

The scope of works for the assessment included a desktop review of site history and environmental features such as geology and hydrology, site walkover assessments and limited soil sampling within the land surrounding the rail line.

A search of the NSW Rail Transport Museum website indicated that the Great Northern Rail Line between Newcastle and Singleton was completed by the end of the 1860's. The historical review indicated that the areas surrounding the rail line are likely to have been used for residential/rural land use from 1908 to the present day, with the exception of a few commercial/industrial premises. No records relating to specific contamination or remediation were identified within the Department of Environment, Climate Change and Water contaminated land register.

A review of the Department of Land and Water Conservation acid sulfate soil risk maps indicated there was only one small area of risk, classified as high probability of occurrence of acid sulfate soil materials within 1 metre of the ground surface. This area was located just within the investigation area, 40 metres south of the railway, between chainage 195.490 - 195.510. It is unlikely that this area will be disturbed by the Project, however if disturbed this poses a severe localised environmental risk.

Hunter 8 undertook site inspections on 1 and 2 July, and 26 August, 2009.

Based on the historical review and site inspection the most likely sources of contamination within the investigation area were considered to be associated with the agricultural activities, imported fill and the rail line. Table 8-1 presents a summary of the potential contaminants of concern and associated sources.

Table 8-1 Potential Sources of Contamination

Area of Concern	Rational / Details	Potential Chemicals of Concern
Rural properties	Spraying for weed and pest control Use of fertilisers	Total petroleum hydrocarbons (TPH) Polynuclear aromatic hydrocarbons (PAHs) Heavy metals Organochlorine pesticides (OCP) Organophosphate pesticides (OPP)

Area of Concern	Rational / Details	Potential Chemicals of Concern
Rail corridor	Fill and ballast material Asbestos fibres from train brakes Spraying for weeds and pest control Fuels, oils and greases Asbestos and lead paint residues in former buildings Electrical transformers Illegal dumping	Total petroleum hydrocarbons (TPH) Benzene, toluene, ethyl benzene and xylene (BTEX) Polynuclear aromatic hydrocarbons (PAHs) Heavy metals Asbestos Organochlorine pesticides (OCP) Organophosphate pesticides (OPP) Polychlorinated biphenyls (PCB)
Noise mounds	Fill and ballast material	Total petroleum hydrocarbons (TPH) Benzene, toluene, ethyl benzene and xylene (BTEX) Polynuclear aromatic hydrocarbons (PAHs) Heavy metals Asbestos
Stockpiles	Fill and ballast material	Total petroleum hydrocarbons (TPH) Benzene, toluene, ethyl benzene and xylene (BTEX) Polynuclear aromatic hydrocarbons (PAHs) Heavy metals Asbestos Organochlorine pesticides (OCP)
Heritage Sites	Fill and ballast material Spraying for weeds and pest control Fuels, oils and greases Asbestos and lead paint residues in former buildings	Total petroleum hydrocarbons (TPH) Benzene, toluene, ethyl benzene and xylene (BTEX) Polynuclear aromatic hydrocarbons (PAHs) Heavy metals Asbestos Organochlorine pesticides (OCP)
Vineyards	Spraying for weeds and pest control Use of fertilisers	Heavy Metals Organochlorine pesticides (OCP) Organophosphate pesticides (OPP)

Area of Concern	Rational / Details	Potential Chemicals of Concern
Industrial properties	Fill and ballast material Spraying for weeds and pest control Fuels, oils and greases Asbestos and lead paint residues in former buildings	Total petroleum hydrocarbons (TPH) Benzene, toluene, ethyl benzene and xylene (BTEX) Polynuclear aromatic hydrocarbons (PAHs) Heavy metals Asbestos Organochlorine pesticides (OCP) Organophosphate pesticides (OPP)
Acid sulfate soils	Potential for acidification, and mobilisation of heavy metals, if disturbed	pH Heavy metals ASS/PASS

Hunter 8 collected soil samples from 55 test pit locations and three surface samples, within the rail corridor and within surrounding grazing land to assess potential contamination issues. A random sampling pattern was applied for this investigation, along with some targeted sampling. Within the rail corridor significant disturbance appears to have occurred. Several stockpiles within the corridor were also sampled. Due to access restrictions some potentially contaminated sites were unable to be sampled. Sampling was mostly undertaken within the immediate vicinity of the rail line.

The investigation program undertaken was considered sufficient to provide an indication as to the potential contamination likely to be encountered within the investigation area. However, the sampling density is not considered sufficient to delineate areas of contamination identified or to provide sufficient information to characterise material for off-site disposal. In addition, areas of unknown potential contamination may exist within the investigation area not identified during this limited investigation.

The typical soils encountered within the investigation area during sampling were fill materials – consisting of ballast, silt, sand, and clay – many of which contained displaced natural materials. These were underlain by natural clay. Typical soils encountered adjacent to or within rural properties consisted of natural clays.

Concentrations of heavy metals, Organochlorine Pesticides, Polynuclear Aromatic Hydrocarbons, Total Petroleum Hydrocarbons, Benzene, Toluene, Ethylbenzene, and Xylene, were reported below the Health-Investigation Level, or threshold concentration, for commercial/industrial exposure settings for all individual samples analysed.

Several samples exceeded the Ecological Investigation Level (EIL) for some heavy metals. While concentrations exceeding EILs may indicate some potential environmental impacts the "decision-making process for assessing urban redevelopment sites" from DEC 2006 does not require consideration of EILs when assessing the suitability of a site for commercial / industrial land use such as rail corridor and roads. Samples exceeding the EILs may present an ecological risk, but are not considered to restrict construction activities. These exceedences should be considered when determining potential re-use of excavated material along the route, particularly with respect to contamination of adjacent areas and waterways, but given the concentrations found, are unlikely to present a risk of significant impacts.

Based on the investigations undertaken, soils excavated from the agricultural properties and rail corridor are considered suitable for on-site use, with regards to potential contamination risk to human health and the environment.

The indicative waste classification based on the results to date indicates that soils would generally be classified as General Solid Waste. However, several samples exceeded the General Solid Waste guidelines without TCLP (Toxicity Characteristic Leaching Procedure) analysis. These results are indicative only, based on the insitu sampling undertaken and on the total concentrations of constituents. Incorporation of TCLP analysis is likely to result in a reduction in waste classification.

An environmental risk assessment was carried out for the Project, in regard to contamination, and resulted in the recommendation of the following mitigation measures:

- Undertake Phase 2 Contamination Assessments in identified areas of concern likely to contain contaminants, where limited access has prevented investigation to date. This comprises the metal fabrication and engineering property on Standen Drive, Energy Australia Depot on Wollombi Road, truck haulage property on Wollombi Road, and Former Hunter Distillery property.
- Develop and implement a Spoil and Fill Management Plan (SFMP) as part of the Construction Environmental Management Plan (CEMP) for managing possible contaminated materials not encountered and assessed during this investigation. The SFMP for the proposed works should detail appropriate procedures for the handling, stockpiling and assessing potentially contaminated materials during the works. The SFMP should also include a contingency plan for unexpected hazards that may be encountered during site works.
- Manage waste in accordance with relevant legislation.
- Implementation of Asbestos Management Plan as part of the CEMP, including procedures for management and disposal should asbestos be identified. Should any signal huts or structures within the site area be scheduled for removal, it is recommended that a hazardous material survey be undertaken prior to demolition.
- Implementation of an Acid Sulfate Soil Management Plan as part of the CEMP.

9. References

ANZECC/NHMRC, 1992, *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites*.

Contaminated Land Management Act 1997.

Department of Land and Water Conservation (DLWC), 1992, *Maitland Acid Sulfate Soil Risk Map – Edition Two*.

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

NSW DEC, 2006, *Guidelines for NSW Site Auditor Scheme (2nd Ed.)*.

NSW DECCW, 2009, *Waste Classification Guidelines, Part 1: Classifying Waste*.

NSW EPA, 1994, *Guidelines for Assessment of Service Station Sites.*

NSW EPA, 1995, *Sampling Design Guidelines*.

NSW EPA, 1997, *Guidelines for Consultants Reporting on Contaminated Sites*.

Protection of the Environmental Operations Amendment (Scheduled Activities and Waste) Regulation, 2009.

Soil Conservation Service of NSW, 1991, *Soil Landscapes of Singleton 1:250,000 Sheet*.

Soil Conservation Service of NSW, 1991, *Soil Landscapes of Newcastle 1:100,000 Sheet*.

Standards Australia, 2005, *Australian Standard Guide to the sampling and investigation of potentially commentated soil, AS4482.1, 2005*.

Geological Survey of New South Wales, 2003, *Statewide geodatabase* (electronic GIS data).

Appendix A

Environmental Risk Assessment Tables

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Consequence Table

Aspect	Insignificant	Minor	Moderate	Major	Catastrophic
Flora and fauna species (including EPBC protected species).	Population change not detectable.	Detectable change in population without impact on population viability.	Detectable change in population and impact on population viability that is significant at a local level.	Detectable change in population and impact on population viability that is significant at a regional level.	Detectable change in population and impact on population viability that is significant at a State or Commonwealth level.
Endangered Ecological communities (EEC).	Insignificant loss of native vegetation.	Loss of EEC significant at the local level. Net gain achievable.	Loss of EEC significant at the Regional level. Net gain achievable.	Loss of EEC significant at the State level. Net gain achievable.	Loss of EEC significant at the State level. Net gain not achievable.
Waterways and floodplain function.	Negligible change to waterway and flow regime.	Changes to waterway or flow regime with minor implications.	Changes to waterway or floodplain function with moderate implications.	Waterway or floodplain function or river health significantly compromised.	Extensive impact to waterway or floodplain function, river health irreversibly disturbed.
Cultural heritage (Aboriginal and non-Aboriginal).	No impact to heritage sites.	Disturbance or partial removal of a small number of heritage artefacts.	Complete removal of one or more heritage artefacts confined to a small number of locations.	Complete removal of many heritage artefacts across many locations. Disturbance of a heritage site of high scientific significance.	Widespread removal of heritage artefacts across a region. Destruction of a heritage site of high scientific significance.
Air quality, noise and water quality.	Applicable air quality, noise and water quality standards met across the region.	Isolated exceedence of air quality, noise or water quality standards that is short lived.	Exceedence of applicable air quality, noise or water quality standards in a local area.	Exceedence of applicable air quality, noise or water quality standards in a number of local areas.	Widespread exceedence of applicable air quality, noise or water quality standards across the region.

Aspect	Insignificant	Minor	Moderate	Major	Catastrophic
Groundwater	Negligible change to groundwater regime and availability.	Changes to groundwater regime and availability but no significant implications.	Changes to groundwater regime and availability with minor implications.	Groundwater regime or availability significantly compromised.	Widespread groundwater resource depletion and subsidence.
Economic impacts on businesses	Loss of annual revenue less than $100,000.	Loss of annual revenue less $1M but greater than $100,000.	Loss of revenues less than $10M but greater than $1M.	Loss of revenues less than $100M but greater than $10M.	Loss of revenues less than $1B but greater than $100M.
Land use planning impacts	Land use changes resulting in consistency with planning policies.	Land use changes result in minor inconsistency with planning policies.	Land use changes result in significant inconsistency with local planning policies.	Land use changes result in significant inconsistency with state planning policies.	Land use changes result in complete inconsistency with planning policies.
Social	Changes to amenity, access, view shed, community facilities are not noticeable or displacement of a small number of residences.	Changes to amenity, access, view shed, community facilities are noticeable. Or displacement of a number of residences within a local area.	Changes to amenity, access, view shed, community facilities are noticeable and causing community concern. Or displacement of a number of residences effecting a small section of the region.	Changes to amenity, access, view shed, community facilities are noticeable and causing major community concern. Or displacement of a number of residences effecting a large part of the region.	Changes to amenity, access, view shed, community facilities are noticeable and causing major community concern perhaps resulting in negative media attention. Or displacement of a number of residences effecting the entire region.

Aspect	Insignificant	Minor	Moderate	Major	Catastrophic
Health and safety	Minor injury or illness to less than 10 individuals. Major injury or illness to one individual.	Minor injury or illness to 10 to 100 individuals. Major injury or illness to between 1 and 10 individuals.	Minor injury or illness to between 100 and 1000 individuals. Major injury or illness to between 10 and 100 individuals.	One fatality or permanent disability.	Between one and ten fatalities or permanent disabilities.
Project cost	Negligible increase in project costs.	Increase in project costs by up to 5%.	Increase in project costs by up to 15%.	Increase in project costs by up to 50%.	Increase in project costs by more than 50%.
Project delay	Delay in project of < 1 week.	Delay in project of 1-4 weeks.	Delay in project of 1-3 months.	Delay in project of 3-6 months.	Project cancelled or delayed indefinitely.

Likelihood Table

Likelihood	Description
Almost Certain	The event is expected to occur in most circumstances
Likely	The event will probably occur in most circumstances
Possible	The event could occur
Unlikely	The event could occur but not expected
Rare	The event occurs only in exceptional circumstances

Risk Matrix

Likelihood Level	Consequence Level				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain	Low	Medium	High	Extreme	Extreme
Likely	Low	Medium	High	High	Extreme
Possible	Negligible	Low	Medium	High	High
Unlikely	Negligible	Low	Medium	Medium	High
Rare	Negligible	Negligible	Low	Medium	Medium

Environmental Risk Register – Contamination

Risk No	Risk Pathway Description (how the project interacts with assets, values and uses)	Description of Consequences	Planned Controls to Manage Risk (as per Project Description)	Risk Assessment (Control)			Additional Controls Recommended to Reduce Risk	Treated Risk Assessment		
				Consequence	Likelihood	Risk Rating		Consequence	Likelihood	Risk Rating
1	Construction of the Project results in disturbance of Contaminated Soils within the area of construction during Earthworks.	Pollution of adjoining waterways. Pollution of groundwater. Pollution of uncontaminated soils. Generation of soils requiring specialist, management, treatment and/or disposal. Workers and Residents exposed to contaminants by ingestion, inhalation or dermal contact.	Undertake Phase 2 Contamination Assessments in areas likely to contain contaminants. Implementation of a Spoil and Fill Management Plan as part of the Construction Environmental Management Plan, including OH&S procedures and procedures for management and disposal should contamination be identified. Manage waste in accordance with relevant legislation.	Minor	Possible	Low				

Risk No	Risk Pathway Description (how the project interacts with assets, values and uses)	Description of Consequences	Planned Controls to Manage Risk (as per Project Description)	Risk Assessment (Control)			Additional Controls Recommended to Reduce Risk	Treated Risk Assessment		
				Consequence	Likelihood	Risk Rating		Consequence	Likelihood	Risk Rating
2	Construction of project results in generation of dust containing contaminants	Pollution of adjoining waterways Pollution of uncontaminated soils Exceedance of air quality objectives Workers and Residents exposed to contaminants by ingestion, inhalation or dermal contact	Undertake Phase 2 Contamination Assessments in areas likely to contain contaminants Implement Environmental controls including dust management Implementation of a Spoil and Fill Management Plan as part of the Construction Environmental Management Plan, including OH&S procedures and procedures for management and disposal should contamination be identified	Minor	Unlikely	Low				

Risk No	Risk Pathway Description (how the project interacts with assets, values and uses)	Description of Consequences	Planned Controls to Manage Risk (as per Project Description)	Risk Assessment (Control)			Additional Controls Recommended to Reduce Risk	Treated Risk Assessment		
				Consequence	Likelihood	Risk Rating		Consequence	Likelihood	Risk Rating
3	Construction of Project results in dewatering of contaminated groundwater or groundwater close to an existing contaminant plume	Pollution of adjoining waterways Migration of groundwater plume Pollution of uncontaminated soils Generation of contaminated water requiring specialist management, treatment and/or disposal. Workers and Residents exposed to contaminants by ingestion, or dermal contact.	Undertake Phase 2 Contamination Assessments in areas likely to contain contaminants Implementation of a Spoil and Fill Management Plan as part of the Construction Environmental Management Plan, including OH&S procedures and procedures for management and disposal should contamination be identified	Minor	Unlikely	Low				

Risk No	Risk Pathway Description (how the project interacts with assets, values and uses)	Description of Consequences	Planned Controls to Manage Risk (as per Project Description)	Risk Assessment (Control)			Additional Controls Recommended to Reduce Risk	Treated Risk Assessment		
				Consequence	Likelihood	Risk Rating		Consequence	Likelihood	Risk Rating
4	Construction of the Project results in disturbance of asbestos in soils during earthworks	Disturbance of asbestos in soil requiring specialist management and disposal. Workers and residents exposed to asbestos by inhalation contact.	Undertake Phase 2 Contamination Assessments in areas likely to contain contaminants including asbestos Implementation of an Asbestos Management Plan as part of the Construction Environmental Management Plan, including procedures for management and disposal should asbestos be identified Implementation of Construction Asbestos Management Plan	Moderate	Rare	Low				

Risk No	Risk Pathway Description (how the project interacts with assets, values and uses)	Description of Consequences	Planned Controls to Manage Risk (as per Project Description)	Risk Assessment (Control)			Additional Controls Recommended to Reduce Risk	Treated Risk Assessment		
				Consequence	Likelihood	Risk Rating		Consequence	Likelihood	Risk Rating
5	Construction of the project results in disturbance of Acid Sulphate Soils	Potential for the generation of acidic leachate and mobilisation of metals from disturbed soil Potential for pollution of groundwater and surface water (such as through increased acidiity and increased concentrations of metals)	Implementation of an Acid Sulfate Soil Management Plan as part of the Construction Environmental Management Plan	Minor	Unlikely	Low				

Risk No	Risk Pathway Description (how the project interacts with assets, values and uses)	Description of Consequences	Planned Controls to Manage Risk (as per Project Description)	Risk Assessment (Control)			Additional Controls Recommended to Reduce Risk	Treated Risk Assessment		
				Consequence	Likelihood	Risk Rating		Consequence	Likelihood	Risk Rating
6	Construction of the project results in dewatering of Acid Sulphate Soils	Potential for the generation of acidic leachate and mobilisation of metals from dewatered acid sulfate soil Potential for pollution of groundwater and surface water (such as through increased acidiity and increased concentrations of metals) Generation of water requiring treatment prior to discharge	Implementation of an Acid Sulfate Soil Management Plan as part of the Construction Environmental Management Plan	Minor	Unlikely	Low				

Appendix B

Figures

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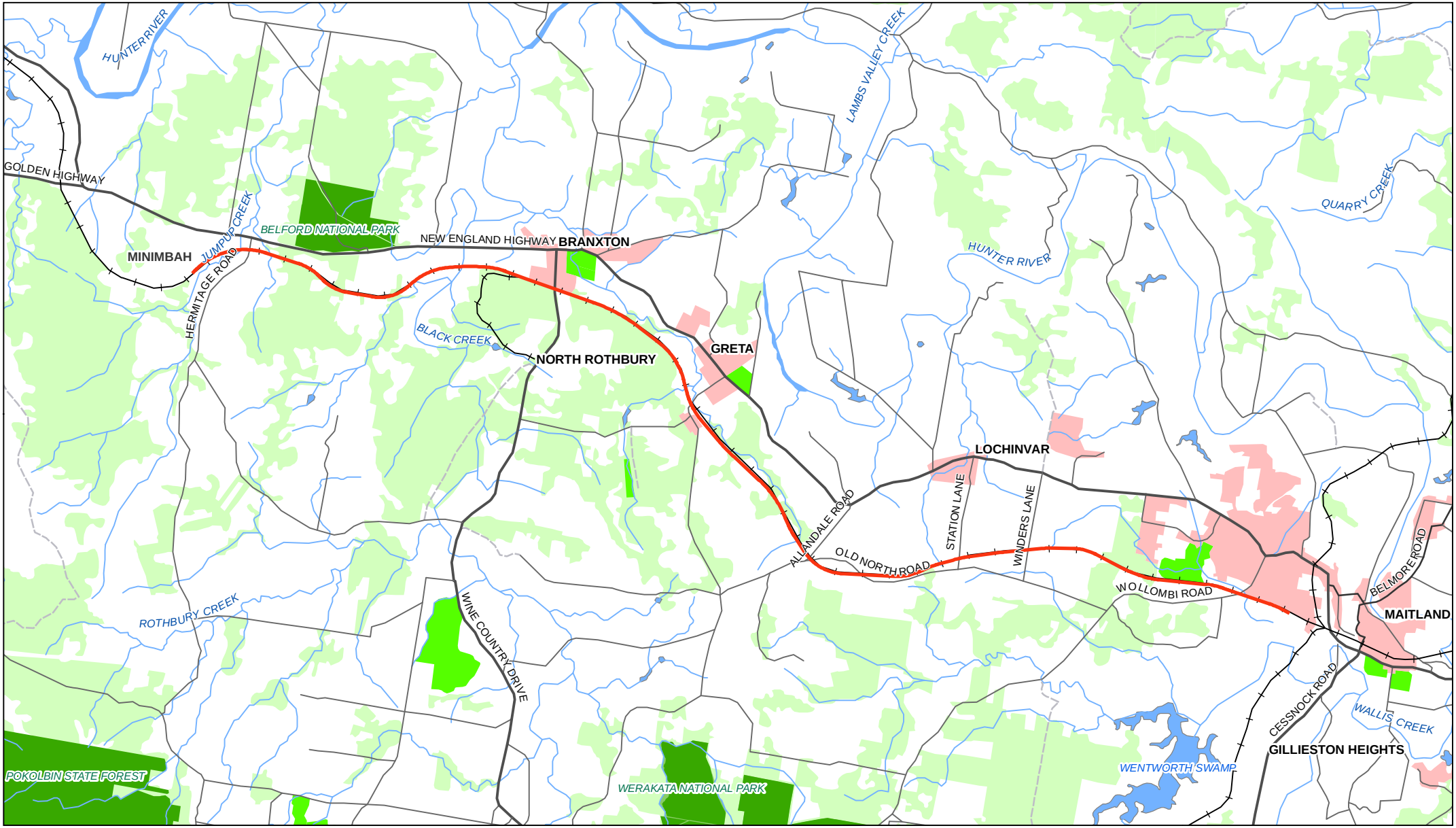


1:120,000 (at A4)

0 485 970 1,940 2,910 3,880

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geodetic Datum 1966
Grid: Integrated Survey Grid, Zone 56-1

N

LEGEND

- Principal Road
- Secondary Road
- Minor Road
- Track
- Existing Rail
- Water Course
- Project Location
- Built Up Areas
- Watercourse Areas
- Recreation Areas
- Nature Conservation Reserve
- State Forest
- Forest Or Shrub

Maitland To Minimbah Third Track
Preliminary Contamination Report

Job Number 22-14471
Revision A
Date May 2010

Locality Map

Figure 1

G:\22\14471\GIS\Maps\Deliverables\EA\Preliminary Contamination Report\PCR_Locality_20091007_A.mxd

Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 T 61 2 4979 9999 F 61 2 4979 9988 E ntlmail@ghd.com.au W www.ghd.com.au

Data Source: Geoscience Australia: Topography - 2003. Created by: fmackay, msmiljkovski

1:3,000 (at A4)

0 15 30 60 90 120

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geodetic Datum 1966
Grid: Integrated Survey Grid, Zone 56-1

N

Legend

- Soil Sample Locations
- Construction Impact Zone
- Project Location
- Investigation Area
- HydroArea
- Watercourse

Hunt8r ALLIANCE

Maitland To Minimbah Third Track
Preliminary Contamination Report

Job Number	22-14471
Revision	A
Date	May 2010

Sample Locations
Areas of Concern

Figure 2

G:\22\14471\GIS\Maps\Deliverables\EA\Preliminary Contamination Report\Sample_Locations_20091001_A.mxd

Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 **T** 61 2 4979 9999 **F** 61 2 4979 9988 **E** ntlmail@ghd.com.au **W** www.ghd.com.au

Data Source: DPT of Lands: DCDB - 2007, Aerial Photography - 2006; DPT of Lands: dtob - 2007. Created by: msmiljkovski

1:2,000 (at A4)

0 10 20 40 60 80

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geodetic Datum 1966
Grid: Integrated Survey Grid, Zone 56-1

N

Legend

- Soil Sample Locations
- Construction Impact Zone
- Project Location
- Investigation Area
- HydroArea
- Watercourse

Maitland To Minimbah Third Track
Preliminary Contamination Report

Job Number	22-14471
Revision	A
Date	May 2010

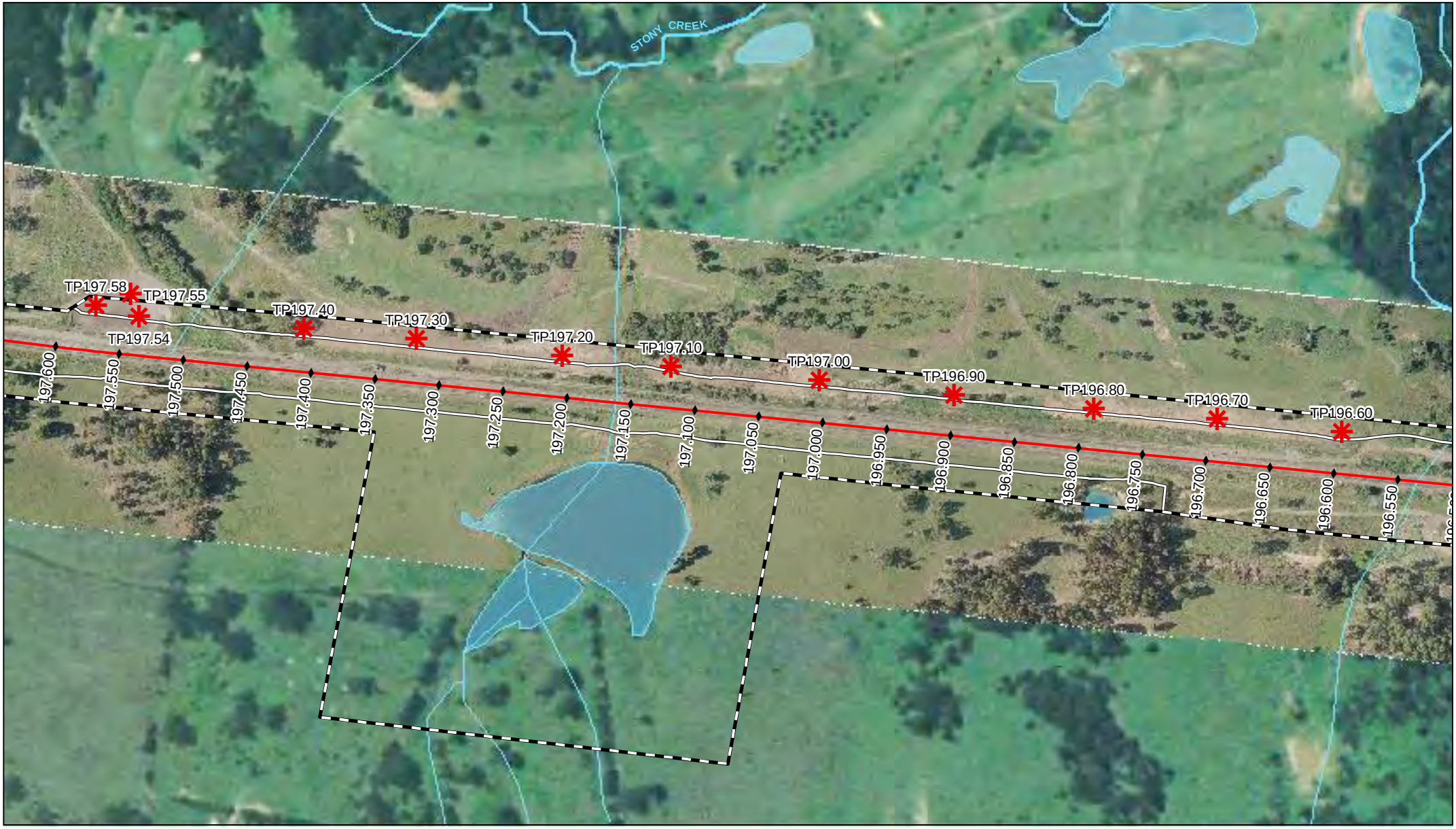
Sample Locations
Areas of Concern

Figure 3

G:\22\14471\GIS\Maps\Deliverables\EA\Preliminary Contamination Report\Sample_Locations_20091001_A.mxd

Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 **T** 61 2 4979 9999 **F** 61 2 4979 9988 **E** ntlmail@ghd.com.au **W** www.ghd.com.au

Data Source: DPT of Lands: DCDB - 2007, Aerial Photography - 2006; DPT of Lands: dtob - 2007. Created by: msmiljkovski



1:4,000 (at A4)

0 20 40 80 120 160

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geodetic Datum 1966
Grid: Integrated Survey Grid, Zone 56-1

N

Legend

- Soil Sample Locations
- Construction Impact Zone
- Project Location
- Investigation Area
- HydroArea
- Watercourse

Maitland To Minimbah Third Track
Preliminary Contamination Report

Job Number 22-14471
Revision A
Date May 2010

Sample Locations
Areas of Concern

Figure 4

G:\22\14471\GIS\Maps\Deliverables\EA\Preliminary Contamination Report\Sample_Locations_20091001_A.mxd

Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 **T** 61 2 4979 9999 **F** 61 2 4979 9988 **E** ntlmail@ghd.com.au **W** www.ghd.com.au

Data Source: DPT of Lands: DCDB - 2007, Aerial Photography - 2006; DPT of Lands: dtob - 2007. Created by: msmiljkovski

1:1,000 (at A4)

0 5 10 20 30 40

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geodetic Datum 1966
Grid: Integrated Survey Grid, Zone 56-1

N

Legend

- Soil Sample Locations
- Construction Impact Zone
- Project Location
- Investigation Area
- HydroArea
- Watercourse

Maitland To Minimbah Third Track
Preliminary Contamination Report

Job Number	22-14471
Revision	A
Date	May 2010

Sample Locations
Areas of Concern

Figure 5

G:\22\14471\GIS\Maps\Deliverables\EA\Preliminary Contamination Report\Sample_Locations_20091001_A.mxd

Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 **T** 61 2 4979 9999 **F** 61 2 4979 9988 **E** ntlmail@ghd.com.au **W** www.ghd.com.au

Data Source: DPT of Lands: DCDB - 2007, Aerial Photography - 2006; DPT of Lands: dtob - 2007. Created by: msmiljkovski

1:500 (at A4)

0 2.5 5 10 15 20

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geodetic Datum 1966
Grid: Integrated Survey Grid, Zone 56-1

N

Legend

- Soil Sample Locations
- Construction Impact Zone
- Project Location
- Investigation Area
- HydroArea
- Watercourse

Maitland To Minimbah Third Track
Preliminary Contamination Report

Job Number	22-14471
Revision	A
Date	May 2010

Sample Locations
Areas of Concern

Figure 6

Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 **T** 61 2 4979 9999 **F** 61 2 4979 9988 **E** ntlmail@ghd.com.au **W** www.ghd.com.au

G:\22\14471\GIS\Maps\Deliverables\EA\Preliminary Contamination Report\Sample_Locations_20091001_A.mxd

Data Source: DPT of Lands: DCDB - 2007, Aerial Photography - 2006; DPT of Lands: dtob - 2007. Created by: msmiljkovski

1:2,500 (at A4)

0 12.5 25 50 75 100

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geodetic Datum 1966
Grid: Integrated Survey Grid, Zone 56-1

N

Legend

- Soil Sample Locations
- Construction Impact Zone
- Project Location
- Investigation Area
- HydroArea
- Watercourse

Maitland To Minimbah Third Track
Preliminary Contamination Report

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Revision A
Date May 2010

Sample Locations
Areas of Concern

Figure 7

G:\22\14471\GIS\Maps\Deliverables\EA\Preliminary Contamination Report\Sample_Locations_20091001_A.mxd

Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 **T** 61 2 4979 9999 **F** 61 2 4979 9988 **E** ntlmail@ghd.com.au **W** www.ghd.com.au

Data Source: DPT of Lands: DCDB - 2007, Aerial Photography - 2006; DPT of Lands: dtob - 2007. Created by: msmiljkovski

1:2,500 (at A4)

0 12.5 25 50 75 100

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geodetic Datum 1966
Grid: Integrated Survey Grid, Zone 56-1

N

Legend

- Soil Sample Locations
- Construction Impact Zone
- Project Location
- Investigation Area
- HydroArea
- Watercourse

Maitland To Minimbah Third Track
Preliminary Contamination Report

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Revision	A
Date	May 2010

Sample Locations
Areas of Concern

Figure 8

G:\22\14471\GIS\Maps\Deliverables\EA\Preliminary Contamination Report\Sample_Locations_20091001_A.mxd

Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 **T** 61 2 4979 9999 **F** 61 2 4979 9988 **E** ntlmail@ghd.com.au **W** www.ghd.com.au

Data Source: DPT of Lands: DCDB - 2007, Aerial Photography - 2006; DPT of Lands: dtob - 2007. Created by: msmiljkovski

1:2,500 (at A4)

0 12.5 25 50 75 100

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geodetic Datum 1966
Grid: Integrated Survey Grid, Zone 56-1

N

Legend

- Soil Sample Locations
- Construction Impact Zone
- Project Location
- Investigation Area
- HydroArea
- Watercourse

Maitland To Minimbah Third Track
Preliminary Contamination Report

Job Number	22-14471
Revision	A
Date	May 2010

Sample Locations
Areas of Concern

Figure 9

G:\22\14471\GIS\Maps\Deliverables\EA\Preliminary Contamination Report\Sample_Locations_20091001_A.mxd

Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 **T** 61 2 4979 9999 **F** 61 2 4979 9988 **E** ntlmail@ghd.com.au **W** www.ghd.com.au

Data Source: DPT of Lands: DCDB - 2007, Aerial Photography - 2006; DPT of Lands: dtob - 2007. Created by: msmiljkovski

1:2,500 (at A4)

0 12.5 25 50 75 100

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geodetic Datum 1966
Grid: Integrated Survey Grid, Zone 56-1

N

Legend

- Soil Sample Locations
- Construction Impact Zone
- Project Location
- Investigation Area
- HydroArea
- Watercourse

Maitland To Minimbah Third Track
Preliminary Contamination Report

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Revision A
Date May 2010

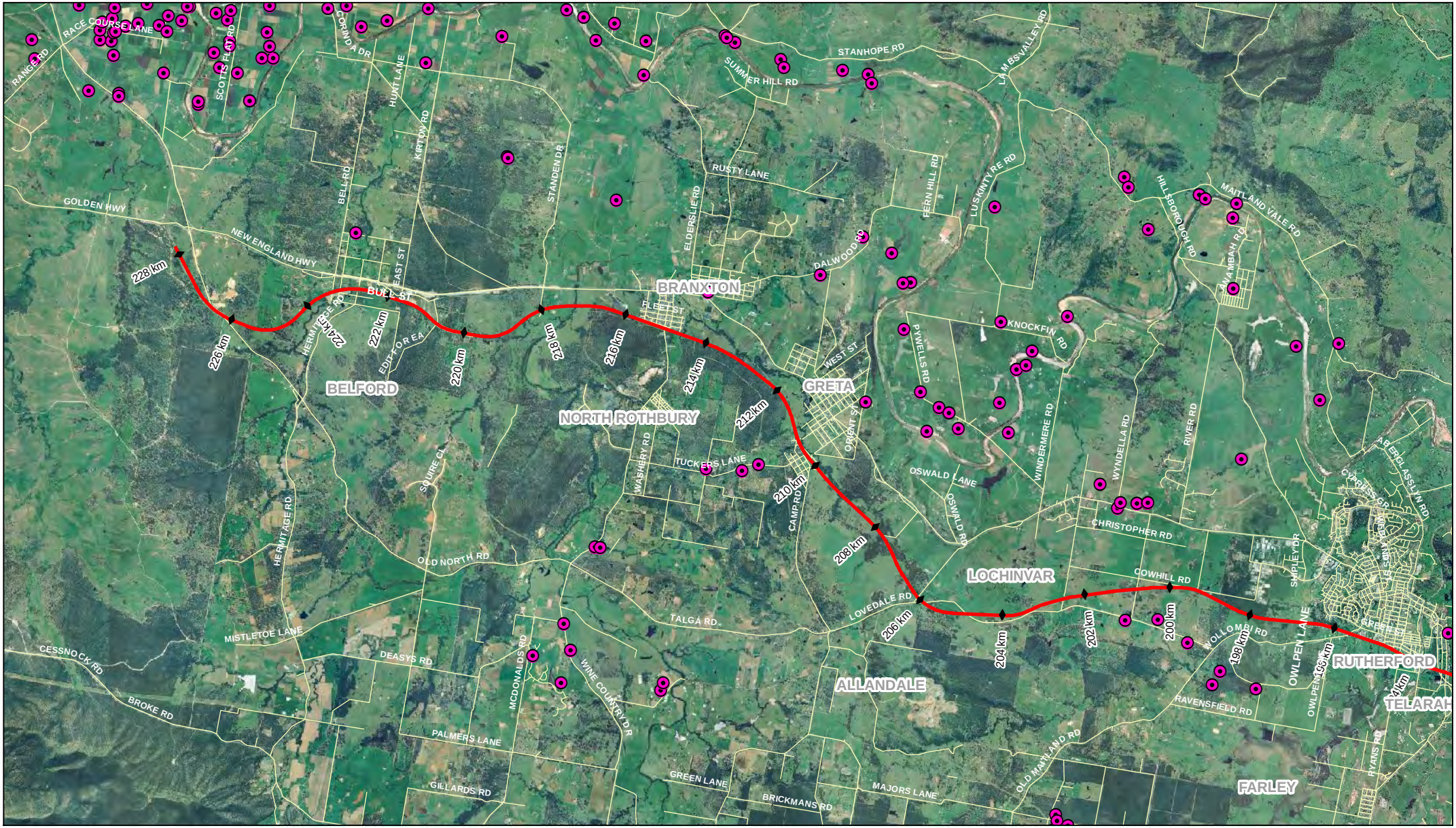
Sample Locations
Areas of Concern

Figure 10

G:\22\14471\GIS\Maps\Deliverables\EA\Preliminary Contamination Report\Sample_Locations_20091001_A.mxd

Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 **T** 61 2 4979 9999 **F** 61 2 4979 9988 **E** ntlmail@ghd.com.au **W** www.ghd.com.au

Data Source: DPT of Lands: DCDB - 2007, Aerial Photography - 2006; DPT of Lands: dtob - 2007. Created by: msmiljkovski



1:120,000 (at A4)

0 5001,000 2,000 3,000 4,000

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geodetic Datum 1966
Grid: Integrated Survey Grid, Zone 56-1

N

LEGEND

- Project Location
- GroundWater Bore Location

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Groundwater Bore Locations

Figure 11

G:\22\14471\GIS\Maps\Deliverables\EA\Preliminary Contamination Report\Fig_11_Groundwater_Bore_Locations_20091001_A.mxd

Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 **T** 61 2 4979 9999 **F** 61 2 4979 9988 **E** ntlmail@ghd.com.au **W** www.ghd.com.au

Data Source: DPT of Lands: DCDB - 2007, Aerial Photography - 2006. Created by: msmiljkovski

1:25,000 (at A4)

0 100 200 400 600 800

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geodetic Datum 1966
Grid: Integrated Survey Grid, Zone 56-1

N

LEGEND

- Existing Underbridge
- Existing Overbridge
- Existing Culvert
- Watercourse
- Rail Centreline
- Built up Areas
- Soil Sample Locations
- Investigation Area
- Non Formed Roads
- Railway Station
- Site Compounds
- HydroArea

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Maitland To Minimbah Third Track
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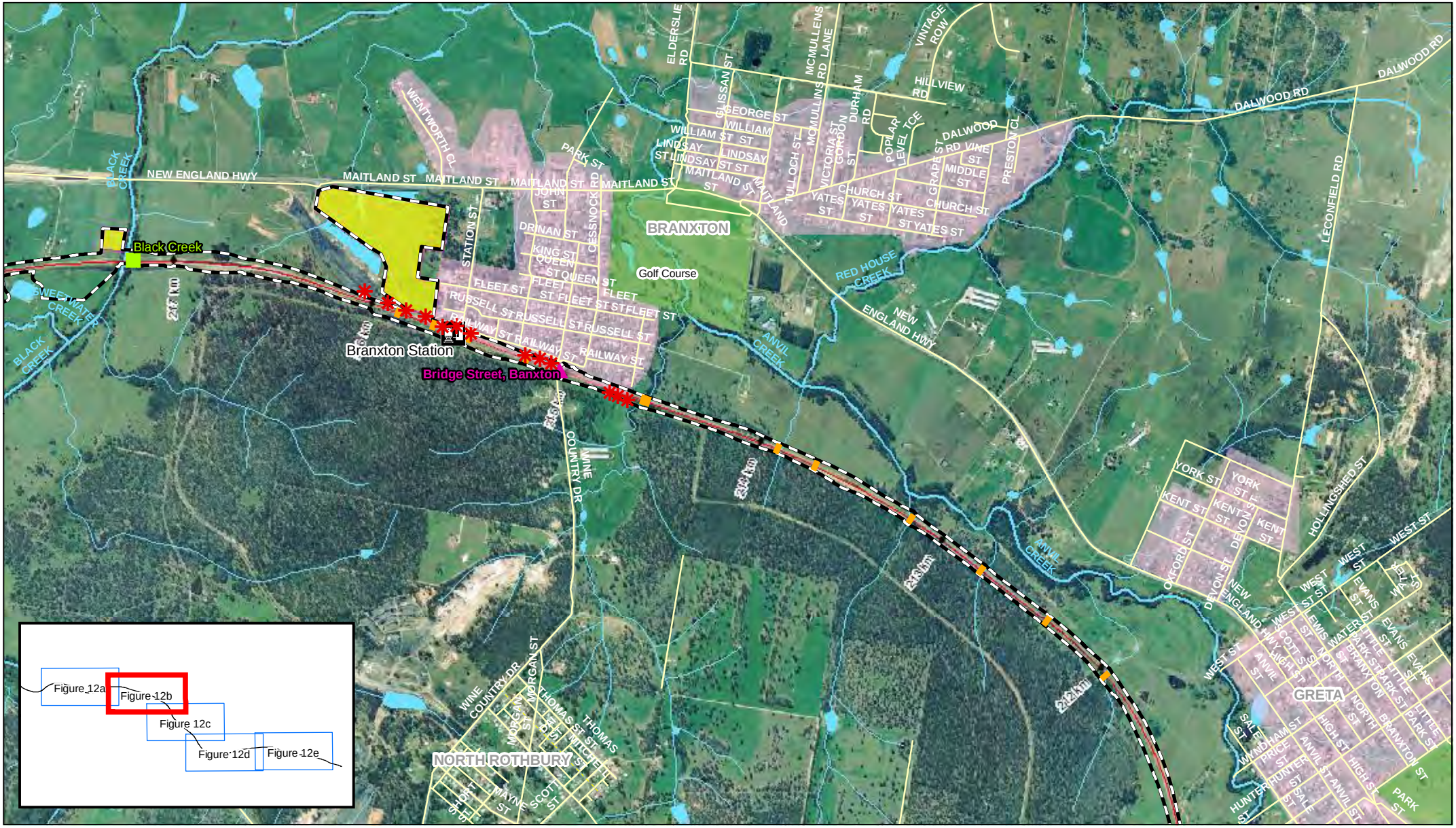
Existing Environment

Figure 12a

G:\22\14471\GIS\Maps\Deliverables\EA\Preliminary Contamination Report\Sample_Location_Project_Description.mxd

Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 **T** 61 2 4979 9999 **F** 61 2 4979 9988 **E** ntlmail@ghd.com.au **W** www.ghd.com.au

Data Source: DPT of Lands: DCDB - 2007, Aerial Photography - 2006. Created by: msmiljkovski



1:25,000 (at A4)

0 100 200 400 600 800

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geodetic Datum 1966
Grid: Integrated Survey Grid, Zone 56-1

N

LEGEND

- Existing Underbridge
- Existing Overbridge
- Existing Culvert
- Watercourse
- Rail Centreline
- Built up Areas
- Soil Sample Locations
- Investigation Area
- Non Formed Roads
- Railway Station
- Site Compounds
- HydroArea

Maitland To Minimbah Third Track
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Figure 12b

G:\22\14471\GIS\Maps\Deliverables\EA\Preliminary Contamination Report\Sample_Location_Project_Description.mxd
Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 **T** 61 2 4979 9999 **F** 61 2 4979 9988 **E** ntlmail@ghd.com.au **W** www.ghd.com.au

Data Source: DPT of Lands: DCDB - 2007, Aerial Photography - 2006. Created by: msmiljkovski

1:25,000 (at A4)

0 100 200 400 600 800

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geodetic Datum 1966
Grid: Integrated Survey Grid, Zone 56-1

N

LEGEND

- Existing Underbridge
- Existing Overbridge
- Existing Culvert
- Watercourse
- Rail Centreline
- Built up Areas
- Soil Sample Locations
- Investigation Area
- Non Formed Roads
- Railway Station
- Site Compounds
- HydroArea

Maitland To Minimbah Third Track
Preliminary Contamination Report

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Date May 2010

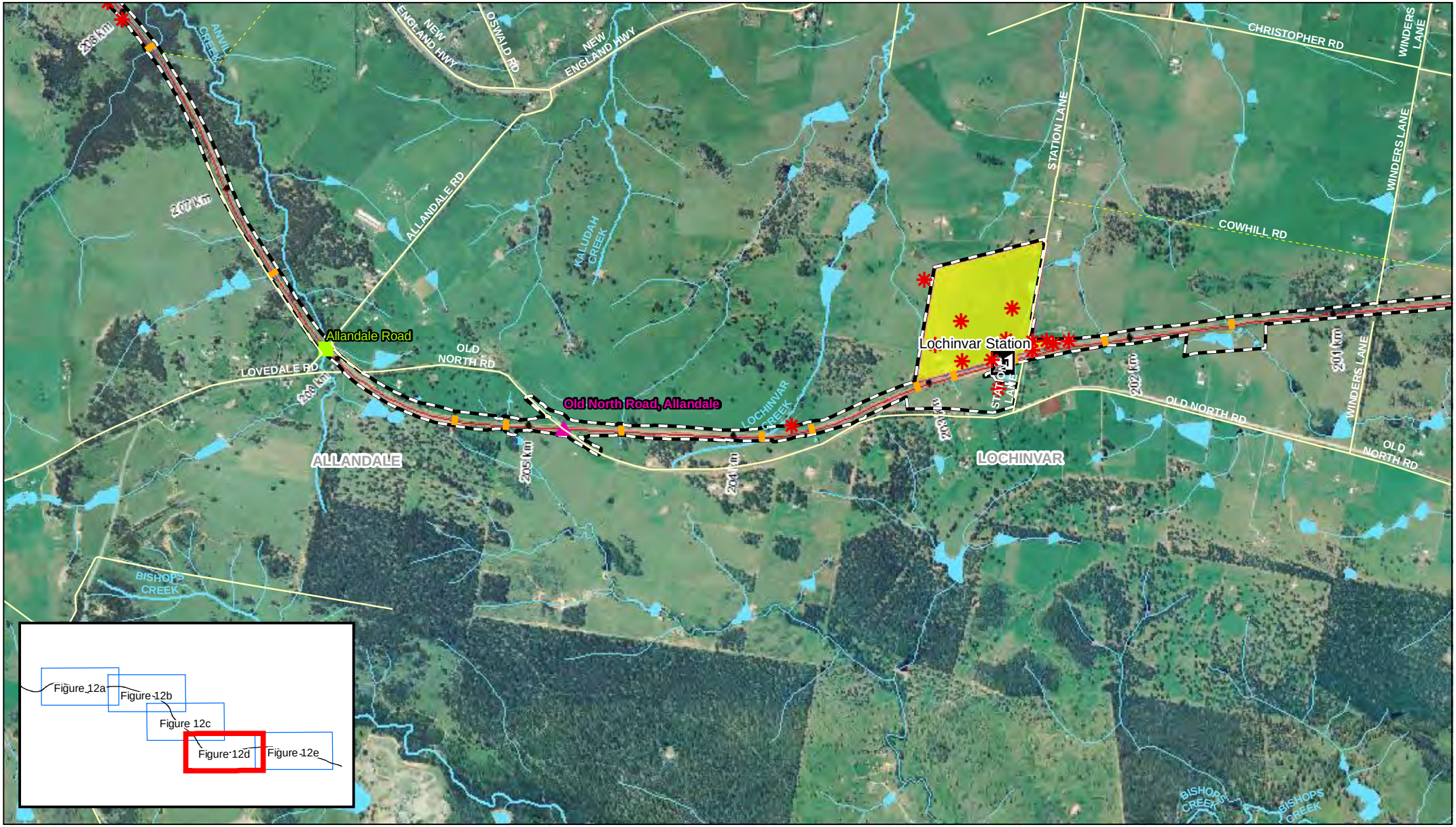
Existing Environment

Figure 12c

G:\22\14471\GIS\Maps\Deliverables\EA\Preliminary Contamination Report\Sample_Location_Project_Description.mxd

Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 **T** 61 2 4979 9999 **F** 61 2 4979 9988 **E** ntlmail@ghd.com.au **W** www.ghd.com.au

Data Source: DPT of Lands: DCDB - 2007, Aerial Photography - 2006. Created by: msmiljkovski



1:25,000 (at A4)

0 100 200 400 600 800

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geodetic Datum 1966
Grid: Integrated Survey Grid, Zone 56-1

N

LEGEND

- Existing Underbridge
- Existing Overbridge
- Existing Culvert
- Watercourse
- Rail Centreline
- Built up Areas
- Soil Sample Locations
- Investigation Area
- Non Formed Roads
- Railway Station
- Site Compounds
- HydroArea

Maitland To Minimbah Third Track
Preliminary Contamination Report

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Date May 2010

Existing Environment

Figure 12d

G:\22\14471\GIS\Maps\Deliverables\EA\Preliminary Contamination Report\Sample_Location_Project_Description.mxd

Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 T 61 2 4979 9999 F 61 2 4979 9988 E ntlmail@ghd.com.au W www.ghd.com.au

Data Source: DPT of Lands: DCDB - 2007, Aerial Photography - 2006. Created by: msmiljkovski

1:25,000 (at A4)

0 100 200 400 600 800

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geodetic Datum 1966
Grid: Integrated Survey Grid, Zone 56-1

N

LEGEND

- Existing Underbridge
- Existing Overbridge
- Existing Culvert
- Watercourse
- Rail Centreline
- Built up Areas
- Soil Sample Locations
- Investigation Area
- Non Formed Roads
- Railway Station
- Site Compounds
- HydroArea

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Maitland To Minimbah Third Track
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Date	May 2010

Existing Environment

Figure 12e

G:\22\14471\GIS\Maps\Deliverables\EA\Preliminary Contamination Report\Sample_Location_Project_Description.mxd

Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 **T** 61 2 4979 9999 **F** 61 2 4979 9988 **E** ntlmail@ghd.com.au **W** www.ghd.com.au

Data Source: DPT of Lands: DCDB - 2007, Aerial Photography - 2006. Created by: msmiljkovski

Appendix C

Groundwater Bore Search

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Table C-1 Summary of Groundwater Database Search

Bore ID	Northing	Easting	Depth to Water	Salinity
GW005011	6373170	354904		
GW005017	6373412	354614	7	
GW005061	6373041	354542	6.4	
GW010003	6390713	336006	10.7	1001-3000 ppm
GW010560	6393890	332537		Brackish
GW010561	6393327	332024	11.3	Good
GW011695	6383777	353498		
GW011755	6390901	347866	12.8	Brackish
GW012741	6383777	353498		
GW012935	6377895	366734	6.7	Good
GW012936	6377895	366734	6.7	Good
GW012937	6377895	366734	6.7	Good
GW012938	6377895	366734	6.7	Good
GW013545	6373258	354642	7.7	Brackish
GW013611	6396225	339672	6.4	
GW013635	6391943	335907	10.7	
GW013711	6393601	326438	9.1	Good
GW013713	6393538	326387	9.1	Good
GW014154	6383001	353119	10.4	Good
GW014307	6377806	366969	6.4	
GW014308	6378216	365401		
GW015096	6394546	327674	10.4	
GW015219	6378311	365582	5.5	Good
GW015630	6377895	366734	6.7	
GW015631	6377895	366734	6.7	
GW015699	6391438	333334	8.8	Good
GW016050	6391957	325815	9.1	0-500 ppm
GW016051	6391965	326258	18	501-1000 ppm
GW016052	6393553	327273	7.9	Good
GW016053	6393465	327905	10.4	Good

GW016054	6393570	328238	10.4	Good
GW016055	6390676	349304	12.2	501-1000 ppm
GW016056	6389718	335475	8.5	Soft
GW016057	6395327	330112	7.6	501-1000 ppm
GW016058	6392242	333477	11.9	Good
GW016059	6397212	328619	8.2	Fresh
GW016060	6386444	350540	7.9	1001-3000 ppm
GW016071	6393847	331833	10.4	
GW016278	6376136	345332	5.2	V.Salty
GW016631	6391869	331449		
GW016845	6388879	370496	5.5	0-500 ppm
GW017433	6391942	366858		Good
GW018276	6391168	366556		Stock
GW018305	6401999	342424		
GW018499	6391256	366189		
GW018553	6395800	340070		
GW018554	6395642	339838		
GW018867	6392190	337833	13.7	S.Salty
GW018986	6375831	326852	2.1	
GW019564	6392929	332188	12.2	
GW019572	6392575	333132		Hard
GW019629	6376857	367424		
GW019708	6391050	332219		
GW019709	6391236	332268		Salty
GW019737	6391395	332552		
GW019781	6390331	333457		
GW020116	6392176	333243	11.6	Good
GW020117	6390712	332277	10.1	
GW020118	6392267	333111		Hard
GW020119	6391881	334031		
GW020120	6392918	337117	12.2	Good
GW020121	6391323	341341		
GW020122	6393728	332096	10.4	Good

GW020723	6381327	346293	36.6	Good
GW021636	6393728	328444	8.5	Soft
GW022693	6380704	356377		Fresh
GW023082	6387546	344086		3001-7000 ppm
GW024140	6393967	326275		
GW024386	6393248	325635	9.1	
GW024732	6395495	327292	14.6	
GW024752	6395242	326957	8.1	
GW024753	6395212	326958	8.5	
GW024754	6395150	326933	7.3	
GW025863	6393976	326744		
GW025864	6394381	327024		
GW025865	6394629	327124		
GW026089	6393279	325635	9.8	Good
GW026090	6391973	337706	11	Excellent
GW026168	6378356	369019	5.5	501-1000 ppm
GW026241	6393465	325736		
GW026843	6389821	332422	3.7	Bad
GW027057	6396469	330223	13.7	Good
GW027088	6397406	329138		Good
GW027106	6394535	330622		Good
GW027107	6394340	330575		Hard
GW027109	6394165	330602	12.5	Good
GW027203	6377678	366658	4.9	
GW027289	6381789	358789		
GW027381	6397061	329698	9.1	Good
GW027758	6393903	329667	10.3	501-1000 ppm
GW027862	6396525	329857	9.8	501-1000 ppm
GW028246	6378275	365244	5.5	0-500 ppm
GW028335	6396491	329675	14	
GW028336	6396864	329904	9.4	
GW028399	6385773	350993		Good
GW028696	6376396	365244	3	501-1000 ppm

GW028891	6382296	353338		
GW029088	6376436	359230	11.6	
GW029701	6377831	368869	7.3	
GW030934	6395623	327603	11.5	501-1000 ppm
GW030936	6395502	327735	13.1	
GW030937	6395626	327785	11.5	
GW030938	6395723	328019	8.3	
GW030939	6395529	327474	11.8	
GW030940	6395406	327502		
GW030949	6395379	327711	15	
GW030950	6395459	327006	13.8	
GW030951	6394927	328319	9.1	
GW030952	6394264	327365		
GW030955	6393802	327373		
GW030956	6394544	327543		
GW030958	6394154	326376	12.1	Good
GW031797	6393930	329432	9.8	1001-3000 ppm
GW032456	6396029	370768	15.2	3001-7000 ppm
GW032525	6390678	339578		1001-3000 ppm
GW032556	6398528	366431	25	3001-7000 ppm
GW032605	6402130	361711	30.2	3001-7000 ppm
GW032637	6391672	343969	15.2	1001-3000 ppm
GW032638	6385073	369112	12.8	1001-3000 ppm
GW032874	6391076	331958	11	
GW032875	6391292	331954	6.7	
GW032876	6391267	332320	8.2	Good
GW032966	6391952	369882	21.3	
GW033474	6377782	365225	9.1	
GW033482	6391478	332003		
GW033977	6391265	343532	14	Good
GW034601	6378005	356916	7.6	
GW035241	6393887	330580	9.7	
GW035290	6382371	352164	8.2	

GW035527	6393455	332335	11.2	
GW035528	6393151	332575	10.9	
GW035785	6396867	328234	6	
GW035951	6376081	326285	0.6	
GW035951	6376081	326285	0.6	
GW035952	6376055	326357	10.3	
GW035952	6376055	326357	10.3	
GW037386	6393009	333308	9.7	
GW037482	6393059	332577	9.4	
GW037482	6393059	332577	7.4	
GW037865	6393947	328675		
GW037899	6395758	330053	11.2	
GW037907	6397142	328571	10.6	
GW038032	6391574	332236	8.5	
GW038032	6391574	332236		
GW038038	6396847	328886		
GW038038	6396847	328886		
GW038080	6393086	332367		501-1000 ppm
GW038199	6394116	327707		
GW042726	6396714	328315	18.5	501-1000 ppm
GW042809	6395092	327169	14.9	
GW042810	6395093	327195	14	
GW042811	6395401	327189	15.2	
GW042812	6395061	327169		
GW043450	6392302	370764		Salty
GW043451	6392272	370843	1	
GW043452	6392723	370029	0.7	
GW043453	6395209	369344		
GW043454	6395207	369188		
GW043455	6394963	369374		
GW043456	6389791	367226		
GW043457	6390558	366955		
GW043575	6391821	332284	3	1001-3000 ppm

GW043883	6370040	338135	3	
GW044495	6389760	332423		
GW044496	6389871	331718	7.3	
GW044861	6397327	328148		
GW044868	6368256	337989		Stock
GW044869	6368989	338486		
GW045318	6383508	364939		
GW045584	6391588	334922		Hard
GW047436	6392192	332330		1001-3000 ppm
GW047437	6392439	332378	6	1001-3000 ppm
GW047571	6391957	325815	0	501-1000 ppm
GW047625	6393827	328834	8.8	1001-3000 ppm
GW047691	6376067	365977		
GW047794	6375630	365515		
GW047794	6375630	365515	3	
GW047827	6361745	331830	32	
GW047869	6391096	334982	10	
GW047999	6398259	330402	8.2	
GW048954	6393947	334101	13.1	3001-7000 ppm
GW049285	6408485	324873		
GW049549	6378705	365160	22.6	
GW050646	6379449	343735		Salty
GW050724	6361951	350586		3001-7000 ppm
GW051087	6378212	365141		0-500 ppm
GW051140	6404001	338310	57	Fresh
GW051301	6376514	358213	1.5	
GW051353	6365810	365986	1.5	3001-7000 ppm
GW051511	6373133	329372	28	
GW051511	6373133	329372		
GW051512	6373476	329652	9	
GW051647	6373006	362896		
GW051824	6392244	366411		
GW051951	6372979	354516		

GW051952	6372918	354517	11.9	
GW052121	6400518	327388	11.9	
GW052210	6397399	339914		
GW053069	6377649	369106		Poor
GW053069	6377649	369106	5.2	Poor
GW053080	6396717	330324	6.7	
GW053194	6391904	337264	5.5	
GW053194	6391904	337264	10.4	
GW053236	6395834	327338		1001-3000 ppm
GW053242	6391485	338053		501-1000 ppm
GW053320	6396886	328905		501-1000 ppm
GW053328	6393454	336013		3001-7000 ppm
GW053335	6389718	335475		501-1000 ppm
GW053411	6366699	361215	9.8	0-500 ppm
GW053411	6366699	361215	11.5	0-500 ppm
GW053412	6366730	361240		0-500 ppm
GW053413	6378073	368580	12.5	501-1000 ppm
GW053413	6378073	368580	9.4	501-1000 ppm
GW053468	6392365	335327		1001-3000 ppm
GW053499	6382298	351436		
GW053507	6391805	334997		
GW053508	6391738	334659		
GW053509	6375600	365593	8.4	0-500 ppm
GW053509	6375600	365593	12.2	0-500 ppm
GW053518	6385739	350811		1001-3000 ppm
GW053525	6390708	335745	11.6	1001-3000 ppm
GW053563	6392278	337519	19.2	0-500 ppm
GW053594	6389606	334277	6	
GW053639	6390813	334622	21.3	501-1000 ppm
GW053696	6390988	335923	16.5	501-1000 ppm
GW053699	6363055	330976	11.9	
GW053721	6392584	335505		
GW053722	6392534	336263	6	

GW053723	6392168	334600		
GW053786	6391963	342843	11.4	
GW053886	6390973	334984		
GW053921	6382857	351714	8	
GW053985	6392200	336529	15.8	
GW054242	6384880	353117	11.2	Fresh
GW054351	6384624	365471	11.9	501-1000 ppm
GW054627	6409679	329943	13	Fair
GW055019	6380578	355916	10.7	Fair
GW055633	6390593	349905		
GW055692	6389667	334276		
GW056198	6384655	365549	18.3	501-1000 ppm
GW056207	6382737	351951	9	1001-3000 ppm
GW056207	6382737	351951	27	1001-3000 ppm
GW056493	6394569	327204	19.2	
GW056766	6397850	335393	11.5	3001-7000 ppm
GW056987	6378213	365167	11.6	501-1000 ppm
GW057354	6380712	355988	11.9	1001-3000 ppm
GW057822	6395523	327161	9.7	501-1000 ppm
GW057823	6395247	327244	7.3	501-1000 ppm
GW057856	6392891	331797	11	
GW058132	6392469	332326	13	1001-3000 ppm
GW058132	6392469	332326	7.3	1001-3000 ppm
GW058351	6388310	355934	11.6	3001-7000 ppm
GW058438	6388085	356035		
GW058500	6374792	327339		
GW058760	6371207	371142		0-500 ppm
GW058946	6384532	361017		1001-3000 ppm
GW059046	6387557	352921		501-1000 ppm
GW059129	6392398	335456	11.6	1001-3000 ppm
GW059179	6395590	327473	11	0-500 ppm
GW059180	6395655	327628	9.1	501-1000 ppm
GW059181	6395785	328070	11	0-500 ppm

GW059215	6393670	331755		501-1000 ppm
GW059335	6394968	325345		1001-3000 ppm
GW059335	6394968	325345	4.2	1001-3000 ppm
GW059336	6394784	325400	25.3	501-1000 ppm
GW059336	6394784	325400	9.1	501-1000 ppm
GW059373	6390719	347940	10.4	Good
GW059442	6387935	357686	12.2	
GW059442	6387935	357686	59	
GW060014	6375117	328322	19.2	0-500 ppm
GW060027	6376277	365506	9	
GW060059	6360508	335205	25	501-1000 ppm
GW060059	6360508	335205	30	501-1000 ppm
GW060060	6360473	334997	3.6	501-1000 ppm
GW060060	6360473	334997	26	501-1000 ppm
GW060110	6390482	344666		
GW060111	6391649	338650		
GW060111	6391649	338650		
GW060206	6391815	343237	4.5	1001-3000 ppm
GW060320	6396196	328663		1001-3000 ppm
GW060351	6391942	339610		
GW060899	6392365	328050		
GW060900	6381144	355502		501-1000 ppm
GW060973	6383220	351266		
GW060992	6392058	366257		1001-3000 ppm
GW061208	6395403	329094		501-1000 ppm
GW061227	6384662	350854		1001-3000 ppm
GW061232	6396105	330517	8.8	Good
GW061232	6396105	330517		Good
GW061253	6385759	358524		3001-7000 ppm
GW061278	6399133	348367		1001-3000 ppm
GW061307	6371148	371299		501-1000 ppm
GW061310	6405214	364279		1001-3000 ppm
GW061339	6385895	348881	7.5	7001-10000 ppm

GW062573	6382575	366619	8	3001-7000 ppm
GW062910	6409089	360304	23	1001-3000 ppm
GW062936	6395695	335506	9.4	
GW063053	6386665	363802	6	
GW063675	6372838	353295	8	3001-7000 ppm
GW064071	6386756	363748	8	
GW064071	6386756	363748		
GW064072	6386696	363853		
GW064072	6386696	363853	9	
GW064462	6377264	365649	7.5	
GW064463	6377264	365649	8	
GW064935	6397722	331402	12	
GW065476	6376325	366807	7	
GW065535	6391435	346554	7	
GW065986	6392332	337100		
GW066057	6396127	328220		
GW066153	6399755	352846	6	Fresh
GW066586	6395940	329919	8	
GW066588	6393800	330869	9	
GW066627	6397381	338740	5	
GW066628	6397556	338163	10	
GW066679	6404150	352181	26	
GW066948	6375529	364891		
GW066950	6377823	363688		
GW067055	6400252	345010		
GW067056	6391283	344705		
GW067060	6360839	334757		
GW067196	6378152	365220		
GW067199	6377813	365199	7.5	
GW067200	6377840	364938		
GW067203	6378272	365010		
GW067206	6378486	364903	8	
GW067210	6378183	365246	24	

GW067228	6378241	364984	22	
GW067230	6378154	365376	7	
GW067231	6378215	365323	13.7	
GW067234	6377627	365175	13.6	
GW067291	6408139	326264	22.8	
GW067790	6397899	330422	8.8	
GW068666	6376502	366632	6.1	
GW068750	6377028	343220	22.3	10001-14000 ppm
GW068751	6376890	342334	23.1	
GW068752	6377644	343041	24.4	10001-14000 ppm
GW068753	6376270	343009	18.6	10001-14000 ppm
GW068887	6408780	360349	10.2	
GW070451	6386803	349857	16.6	
GW070617	6391880	333979	7.8	
GW070621	6390360	335177	24	
GW071219	6375847	325992		
GW071220	6375655	325579		
GW071297	6396127	328220		
GW071564	6378208	364910	53.3	
GW071829	6380711	356617	15.2	
GW072724	6380726	356630		
GW072786	6378128	365334		0-500 ppm
GW073036	6360078	331502	16.7	0-500 ppm
GW078011	6396966	339731		
GW078016	6377690	365278		
GW078044	6370151	370428	16	
GW078046	6368741	368651		
GW078047	6368800	370784		
GW078102	6407437	355815		
GW078120	6368590	371176		
GW078121	6367262	368619		
GW078122	6367663	368666		
GW078123	6368165	369309	15.5	

GW078124	6368018	369883		
GW078125	6368464	370970		
GW078127	6366406	369073		
GW078128	6366923	370912		
GW078191	6384211	353859		Good
GW078199	6391317	335853		
GW078256	6395945	330206		
GW078284	6370022	351804		
GW078293	6407392	339721		Good
GW078294	6404591	339239	10.5	Good
GW078325	6399594	347177		
GW078333	6391285	346791		
GW078357	6396829	335736		
GW078378	6376824	358391		
GW078397	6395059	330639		
GW078497	6386675	338015		
GW078538	6393232	341285		
GW078556	6392860	330510		
GW078557	6392847	330862	16	
GW078564	6377160	364021	10	
GW078565	6377161	364028	23	
GW078566	6392989	330308		
GW078596	6387843	357838		
GW078598	6377799	364399		
GW078662	6383872	353729		
GW078692	6403921	339366		
GW078710	6392045	325762		
GW078711	6392476	326447		
GW078712	6392870	326948		
GW078713	6392570	325858		
GW078714	6392724	328114		
GW078715	6393208	330680		
GW078758	6390397	349997		

GW078771	6391549	333856
GW078803	6395468	330100
GW078805	6393450	330562
GW078812	6390464	334763
GW078814	6360108	363496
GW078816	6360077	363491
GW078817	6385033	354671
GW078820	6392665	330126
GW078838	6375033	369262
GW078839	6375063	369183
GW078840	6374787	369291
GW078841	6374847	369195
GW078842	6374909	369168
GW078843	6374883	369533
GW078844	6374602	369302
GW078845	6374296	369411
GW078846	6374578	369771
GW078893	6395407	329354
GW078905	6395809	330535
GW079088	6371306	358054
GW079089	6371306	358106
GW079090	6371368	358105
GW079091	6371369	358209
GW079092	6371429	358078
GW079093	6371460	358078
GW079094	6371462	358234
GW079095	6371553	358154
GW079096	6371707	358152
GW079097	6371679	358335
GW079098	6371623	358674
GW079099	6371003	358448
GW079100	6371463	358312
GW079101	6371680	358387

GW079102	6371685	358725	
GW079103	6371530	358675	
GW079738	6396698	331547	53
GW079795	6391462	332844	
GW079796	6391926	333039	
GW079797	6392454	333265	
GW079798	6392732	333312	
GW079799	6392552	333504	
GW079800	6391658	333539	
GW079801	6391296	333519	
GW079892	6372257	366598	
GW079948	6372613	370081	27
GW079969	6372681	353679	60
GW080034	6370959	365222	
GW080180	6391387	346592	18
GW080195	6393844	330622	12
GW080240	6376183	326327	
GW080241	6371424	325548	23.9
GW080324	6396482	329872	10
GW080325	6396299	329881	
GW080335	6378016	367003	9
GW080337	6383200	360593	56
GW080430	6378272	369026	15
GW080431	6378165	368667	6.71
GW080478	6381287	347134	
GW080479	6381446	347523	19
GW080554	6396726	339229	
GW080640	6384444	360020	16
GW080644	6407732	347001	12
GW080667	6363230	339570	9
GW080668	6377469	357617	9
GW080796	6371388	358081	
GW080904	6368799	338384	10.5

GW080925	6368126	330386	
GW080955	6376309	345392	
GW080956	6379436	343857	
GW080957	6388518	341515	
GW080958	6388489	341535	
GW080959	6402182	348911	24
GW080960	6408867	347279	
GW080961	6408589	347311	11.5
GW080976	6385453	346265	12.1
GW080977	6382955	349990	
GW080978	6367173	347348	
GW080979	6364408	346481	13
GW080980	6359536	337940	
GW200007	6396583	339113	8.75
GW200178	6397109	327984	10.4
GW200194	6408132	359976	
GW200208	6364142	336744	
GW200249	6367023	343249	
GW200252	6401605	343414	
GW200274	6395269	329237	
GW200275	6395264	329256	
GW200406	6376438	365064	
GW200407	6396084	329713	7
GW200409	6376430	365104	6.4
GW200410	6376455	365094	10.7
GW200411	6376449	365099	
GW200414	6373761	369960	11.3
GW200415	6373738	369986	
GW200442	6377977	356154	12.8
GW200443	6362392	339910	
GW200458	6392232	337575	6.7
GW200468	6395129	327279	6.7
GW200492	6391037	330360	6.7

GW200493	6390601	330445	6.7
GW200540	6381603	367199	7.7
GW200543	6387100	356522	6.4
GW200590	6394375	329248	10.7
GW200591	6394497	328033	9.1
GW200626	6362331	371366	9.1
GW200628	6362453	371384	10.4
GW200630	6380255	365997	6.4
GW200631	6380334	366009	
GW200632	6380376	366072	10.4
GW200633	6380388	366003	5.5
GW200656			12.4
GW200658			27
GW200693			
GW271023			
GW271024			9
GW271028			16
GW271029			21

Appendix D

Laboratory Reports

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SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **EN0901483**

Client	: **GHD SERVICES PTY LTD**	Laboratory	: Environmental Division Newcastle
Contact	: MR JESSE SIMKUS	Contact	: Peter Keyte
Address	: PO BOX 5403 NEWCASTLE WEST NSW, AUSTRALIA 2302	Address	: 5 Rosegum Road Warabrook NSW Australia 2304
E-mail	: jesse.simkus@ghd.com.au	E-mail	: peter.keyte@als.com.au
Telephone	: ----	Telephone	: +61-2-4968 9433
Facsimile	: ----	Facsimile	: +61-2-4968 0349
Project	: 22145421	Page	: 1 of 2
Order number	: ----		
C-O-C number	: 135124	Quote number	: ----
Site	: STN RD		
Sampler	: JF	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 26-AUG-2009	Issue Date	: 26-AUG-2009 08:45
Client Requested Due Date	: 31-AUG-2009	Scheduled Reporting Date	: **31-AUG-2009**

Delivery Details

Mode of Delivery	: Client Drop off	Temperature	: ----
No. of coolers/boxes	: ----	No. of samples received	: 1
Sercurity Seal	: Intact.	No. of samples analysed	: 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Requested Deliverables
- Samples received in appropriately pretreated and preserved containers.

Sample Container(s)/Preservation Non-Compliances

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

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process neccessary 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.
When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	SOIL - EA200B Asbestos Identification in Bulk Solids
EN0901483-001	24-AUG-2009 15:00	SLTP010_0.0	✓

Requested Deliverables

MR JESSE SIMKUS

- *AU Certificate of Analysis - NATA (COA)	Email	jesse.simkus@ghd.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	jesse.simkus@ghd.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	jesse.simkus@ghd.com.au
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	jesse.simkus@ghd.com.au
- Default - Chain of Custody (COC)	Email	jesse.simkus@ghd.com.au
- EDI Format - ENMRG (ENMRG)	Email	jesse.simkus@ghd.com.au
- EDI Format - ESDAT (ESDAT)	Email	jesse.simkus@ghd.com.au

MS MELISSA SIMPSON

- A4 - AU Tax Invoice (INV)	Email	Melissa.Simpson@ghd.com.au

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EN0901483**	Page	: 1 of 5
Client	: GHD SERVICES PTY LTD	Laboratory	: Environmental Division Newcastle
Contact	: MR JESSE SIMKUS	Contact	: Peter Keyte
Address	: PO BOX 5403 NEWCASTLE WEST NSW, AUSTRALIA 2302	Address	: 5 Rosegum Road Warabrook NSW Australia 2304
E-mail	: jesse.simkus@ghd.com.au	E-mail	: peter.keyte@als.com.au
Telephone	: ----	Telephone	: +61-2-4968 9433
Facsimile	: ----	Facsimile	: +61-2-4968 0349
Project	: 22145421	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: STN RD		
C-O-C number	: 135124	Date Samples Received	: 26-AUG-2009
Sampler	: JF	Issue Date	: 01-SEP-2009
Order number	: ----		
		No. of samples received	: 1
Quote number	: ----	No. of samples analysed	: 1

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non-volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

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
AS 4964 - 2004 Identification of Asbestos in bulk samples							
Snap Lock Bag							
SLTP010_0.0	**24-AUG-2009**	**---**	---	----	**01-SEP-2009**	28-FEB-2010	✓

Quality Control Parameter Frequency Compliance

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

Matrix:

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	

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	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**
- **For all matrices, no Matrix Spike outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

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

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

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

QUALITY CONTROL REPORT

Work Order	: **EN0901483**	Page	: 1 of 5
Client	: **GHD SERVICES PTY LTD**	Laboratory	: Environmental Division Newcastle
Contact	: MR JESSE SIMKUS	Contact	: Peter Keyte
Address	: PO BOX 5403 NEWCASTLE WEST NSW, AUSTRALIA 2302	Address	: 5 Rosegum Road Warabrook NSW Australia 2304
E-mail	: jesse.simkus@ghd.com.au	E-mail	: peter.keyte@als.com.au
Telephone	: ----	Telephone	: +61-2-4968 9433
Facsimile	: ----	Facsimile	: +61-2-4968 0349
Project	: 22145421	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: STN RD		
C-O-C number	: 135124	Date Samples Received	: 26-AUG-2009
Sampler	: JF	Issue Date	: 01-SEP-2009
Order number	: ----		
		No. of samples received	: 1
Quote number	: ----	No. of samples analysed	: 1

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

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

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
KEN HALL	Analyst	Newcastle

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 insuffient sample for analysis.

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

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

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 Limit

- **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 Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

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

CERTIFICATE OF ANALYSIS

Work Order	: **EN0901483**	Page	: 1 of 3
Client	: **GHD SERVICES PTY LTD**	Laboratory	: Environmental Division Newcastle
Contact	: MR JESSE SIMKUS	Contact	: Peter Keyte
Address	: PO BOX 5403 NEWCASTLE WEST NSW, AUSTRALIA 2302	Address	: 5 Rosegum Road Warabrook NSW Australia 2304
E-mail	: jesse.simkus@ghd.com.au	E-mail	: peter.keyte@als.com.au
Telephone	: ----	Telephone	: +61-2-4968 9433
Facsimile	: ----	Facsimile	: +61-2-4968 0349
Project	: 22145421	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: 135124	Date Samples Received	: 26-AUG-2009
Sampler	: JF	Issue Date	: 01-SEP-2009
Site	: STN RD		
		No. of samples received	: 1
Quote number	: ----	No. of samples analysed	: 1

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
KEN HALL	Analyst	Newcastle

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 insuffient 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 date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

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

- **Asbestos Identification**

Samples were analysed by Polarised Light Microscopy including dispersion staining

Legend for Asbestos Type
Am Amosite (brown asbestos) detected
Ch Chrysotile (white asbestos) detected
Cr Crocidolite (blue asbestos) detected
UMF Unknown mineral fibres detected
- No asbestos fibres detected
(t) Trace levels detected

Confirmation by alternative techniques is recommended for samples where unknown mineral fibres are detected.

Analytical Results

Sub-Matrix: SOIL				Client sample ID	SLTP010_0.0	----	----	----	----
				Client sampling date / time	24-AUG-2009 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EN0901483-001	----	----	----	----
AS 4964 - 2004 Identification of Asbestos in bulk samples									
Asbestos Detected	1332-21-4	0.1	g/kg		**No**	----	----	----	----
Asbestos Type	132207-33-1	0.1	g/kg		**-**	----	----	----	----
Sample weight (dry)	----	0.01	g		**258**	----	----	----	----
APPROVED IDENTIFIER:	----	-	-		**K.HALL**	----	----	----	----

Analytical Results

Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
AS 4964 - 2004 Identification of Asbestos in bulk samples		
EA200: Description	SLTP010_0.0 - 24-AUG-2009 15:00	Grey/brown sandy clay soil with plenty of large sandstone and shale lumps. Plenty of vegetation remains, including roots. Some lumps contain weathered coal.

CHAIN OF CUSTODY DOCUMENTATION

135124

ALS Laboratory Group

CLIENT:	GHD Newcastle	SAMPLER:	JF
ADDRESS / OFFICE:	24 Honeysuckle Drive	MOBILE:	0423163403
PROJECT MANAGER (PM):		PHONE	49799910
PROJECT ID:	22145421	EMAIL REPORT TO:	jesse.simkus@ghd.com.au
SITE:	Stn RD P.O. NO.:	EMAIL INVOICE TO: (if different to report)	melissa.simpson@ghd.com.au
RESULTS REQUIRED (Date):	3 Day T.O QUOTE NO.:		

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No N/A
SAMPLE TEMPERATURE
CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DIPOSAL:

Notes: e.g. Highly contaminated samples
e.g. "High PAHs expected".
Extra volume for QC or trace LORs etc.

SAMPLE INFORMATION (note: S = Soil, W=Water)					CONTAINER INFORMATION		Asbestos
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	
1	SL TP 01 0.0	S	24/8/09			Bag	X

Environmental Division
Newcastle
Work Order
EN0901483

Telephone : +61-2-4968 9433

RELINQUISHED BY:			RECEIVED BY		METHOD OF SHIPMENT
Name:	Julian Fowler	Date: 25/8/09	Name: Hayley Wolfe	Date: 25/8/09	Con' Note No:
Of:	GHD	Time: 15:00	Of: ALS Newcastle	Time: 15:00	
Name:		Date:	Name:	Date:	Transport Co:
Of:		Time:	Of:	Time:	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserveed Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

ALS Laboratory Group

WHITE - LAB COPY
YELLOW - CUSTOMER COPY
PINK - BOOK COPY

LabMark
ENVIRONMENTAL LABORATORIES

Quality, Service, Support

Report Date : 31/08/2009
Report Time : 8:44:08AM

Sample **Receipt** Notice (SRN) for **E044362**

Client Details		Laboratory Reference Information	
Client Name:	GHD Pty Ltd (NSW)	**Please have this information ready when contacting Labmark.**	
Client Phone:	02 4979 9999		
Client Fax:	02 4979 9988	**Laboratory Report:**	**E044362**
Contact Name:	Alison Monkley	**Quotation Number:**	- Not provided, standard prices apply
Contact Email:	alison.monkley@ghd.com.au	**Laboratory Address:**	Unit 1, 8 Leighton Pl. Asquith NSW 2077
Client Address:	PO Box 5403, Newcastle West NSW 2302	**Phone:**	61 2 9476 6533
		Fax:	61 2 9476 8219
Project Name:	221454521	**Sample Receipt Contact:**	Ros Schacht
Project Number:	- Not provided -	**Email:**	Ros.Schacht@labmark.com.au
CoC Serial Number:	153813, 153819	**Reporting Contact:**	Leanne Boag
Purchase Order:	- Not provided -	**Email:**	leanne.boag@labmark.com.au
Surcharge:	No surcharge applied (results by 6:30pm on due date)		
Sample Matrix:	SOIL		

Date Sampled (earliest date):	27/08/2009	**NATA Accreditation:**	13542
Date Samples Received:	28/08/2009	**TGA GMP License:**	185-336 (Sydney)
Date Sample Receipt Notice issued:	31/08/2009	**APVMA License:**	6105 (Sydney)
Date Preliminary Report Due:	07/09/2009	**AQIS Approval:**	NO356 (Sydney)
Client TAT Request Date:	07/09/2009	**AQIS Entry Permit:**	200521534 (Sydney)

Reporting Requirements: Electronic Data Download required: Yes

Invoice Number: 09EA5627

Sample Condition: COC received with samples. Report number and lab ID's defined on COC.
Samples received in good order .
Samples received with cooling media: Crushed ice .
Samples received chilled.
Security seals not used .
Sample container & chemical preservation suitable .

Comments: Metal S-2 as M8 (As, Cd, Cr, Cu, Ni, Pb, Zn & Hg) unless otherwise instructed

Holding Times: Date received allows for sufficient time to meet Technical Holding Times.

Preservation: Chemical preservation of samples satisfactory for requested analytes.

Important Notes:

LabMark shall responsibly dispose of spent customer soil and water samples which includes the disintegration of the sample label. A sample disposal fee of $1.00 is applicable on all samples received by the laboratory regardless of whether they have undergone analytical testing. Sample disposal of environmental samples shall be 31 days (water) and 3 months (soil, HN03 preserved samples) after laboratory receipt, unless otherwise requested in writing by the client. Samples requested to be held in non-refrigerated storage shall incur $5.00/ sample/ 3 months. Additional refrigerated storage shall incur $30/ sample/ 3 months. Combination prices apply only if requested. Transfer of report ownership from LabMark to the client shall occur once full and final payment has been settled and verified. All report copies may be retracted where full payment does not occur within the agreed settlement period.

Analysis comments:

Subcontracted Analyses:

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au

LabMark
ENVIRONMENTAL LABORATORIES

Report Date : 31/08/2009
Report Time : 8:44:08AM

Sample **Receipt** Notice (SRN) for **E044362**

Quality, Service, Support

The table below represents LabMark's understanding and interpretation of the customer supplied sample COC request (refer to SRN comments section on first page for external subcontracting method details). Please confirm that your COC request has been entered correctly. Due to THT and TAT requirements, testing shall commence immediately as per this table, unless the customer intervenes with a correction prior to testing.

GRID REVIEW TABLE

No.	Date	Depth	Client Sample ID	Requested Analysis: BTEX by P&T	Acid extractable metals - mercury	Acid extractable metals (M7)	Moisture	Polyaromatic Hydrocarbons (PAH)	PREP Not Reported	Petroleum Hydrocarbons (TPH)	Volatile TPH by P&T (vTPH)												
224321	27/08		TPQA08	●	●	●	●	●	●	●	●												
224322	27/08		TPQA10	●	●	●	●	●	●	●	●												
			Totals:	2	2	2	2	2	2	2	2												

'PREP Not Reported' refers to an internal laboratory instruction - client confirmation of this parameter is not required.

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au

LabMark
ENVIRONMENTAL LABORATORIES

Report Date : 31/08/2009
Report Time : 8:44:08AM

Sample **Receipt** Notice (SRN) for **E044362**

Quality, Service, Support

No.	Date	Depth	Client Sample ID	Requested Analysis: M8 - M7-T_S																			
224321	27/08		TPQA08	●																			
224322	27/08		TPQA10	●																			
			Totals:	2																			

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney**: 277 Woodpark Rd, Smithfield NSW 2164 Ph 02 8784 8555 E: samples.sydney@alsenviro.com
☑ **Newcastle**: 5 Rosegum Rd, Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com
☐ **Brisbane**: 32 Shand St, Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com
☐ **Townsville**: 14-15 Desma Ct, Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com
☐ **Melbourne**: 2-4 Westall Rd, Springvale, VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsenviro.com
☐ **Adelaide**: 2/1 Burma Rd, Pooraka SA 5095 Ph:08 8359 0890 E: adelaide@alsenviro.com
☐ **Perth**: 10 Hod Way, Malaga, WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ **Launceston**: 27 Wellington St, Launceston, TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: GHD	**TURNAROUND REQUIREMENTS:** (Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☑ Standard TAT (List due date): 31/8/09 ☐ Non Standard or urgent TAT (List due date):
OFFICE: NEWCASTLE	
PROJECT: 22145521	**ALS QUOTE NO.:**
PURCHASE ORDER NUMBER:	
PROJECT MANAGER: Alison Monkley	**CONTACT PH:** 49799990
SAMPLER: Jesse Simkus	**SAMPLER MOBILE:** 0404542354
COC emailed to ALS? (YES / NO)	**EDD FORMAT** (or default):
Email Reports to (will default to PM if no other addresses are listed):	Jesse.Simkus
Email Invoice to (will default to PM if no other addresses are listed):	Melissa.Simpson
COMMENTS/ SPECIAL HANDLING/STORAGE OR DISPOSAL:	

COC SEQUENCE NUMBER (Circle)
COC: (1) 2 3 4 5 6 7
OF: 1 2 3 4 5 6 (7)

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? (Yes) No N/A
Free ice / frozen ice bricks present upon receipt? (Yes) No N/A
Random Sample Temperature on Receipt: 1.8 °C
Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Rhys Holmwood	PETER DONAGHY		JENIE
DATE/TIME: 27/8/09 4 pm	DATE/TIME: 27/8/09 1600	DATE/TIME:	DATE/TIME: 28-8-09 8:20am

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	TPH BTEX	PAHs	Metals 5-2	OCPs	PCBs	COMPOSITE ①	Composite ②		
(3)	TP223.50 0.0M	27/8/09	S	250mL JAR	1			X			X			
33	TP223.50 0.3M													
34	TP223.40B 0.0M													
(4)	TP223.40B 0.3M							X						
(5)	TP223.40A 0.0M							X			X			
35	TP223.40A 0.3M													
(6)	TP223.30 0.0M							X			X			
36	TP223.30 0.3M													
(7)	TP223.20 0.0M							X				X		
37	TP223.20 0.3M													
38	TP223.10 0.0M													
(8)	TP223.10 0.3M							X			X	X		
				TOTAL										

Subcon / Forward Lab / Unit No.
Lab / Analysis: LABMARK
Organised By / Date:
Relinquished By / Date:
Connote / Courier:
WO No: ES0912886
Attach By PO / Internal SF

Environmental Division
Sydney
Work Order
ES0912886

Telephone : +61-2-8784 8555

153813

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.

rec'd 8@ 28/8/09 @ 5:55pm EO44362

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney**: 277 Woodpark Rd, Smithfield NSW 2164 Ph 02 8784 8555 E: samples.sydney@alsenviro.com
☐ **Newcastle**: 5 Rosegum Rd, Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com
☐ **Brisbane**: 32 Shand St, Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com
☐ **Townsville**: 14-15 Desma Ct, Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com
☐ **Melbourne**: 2-4 Westall Rd, Springvale, VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsenviro.com
☐ **Adelaide**: 2/1 Burma Rd, Pooraka SA 5095 Ph:08 8359 0890 E: adelaide@alsenviro.com
☐ **Perth**: 10 Hod Way, Malaga, WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ **Launceston**: 27 Wellington St, Launceston, TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT:
OFFICE:
PROJECT:
PURCHASE ORDER NUMBER:
PROJECT MANAGER: **CONTACT PH:**
SAMPLER: **SAMPLER MOBILE:** 0404542354
COC emailed to ALS? (YES / NO) **EDD FORMAT** (or default):
Email Reports to (will default to PM if no other addresses are listed):
Email Invoice to (will default to PM if no other addresses are listed):

TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)
☐ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.:

COC SEQUENCE NUMBER (Circle)
COC: 1 2 3 4 5 6 (7)
OF: 1 2 3 4 5 6 (7)

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? (Yes) No N/A
Free ice / frozen ice bricks present upon receipt? (Yes) No N/A
Random Sample Temperature on Receipt: 6.8 °C
Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Rhys Holmewood	PETER DONAGHY		JESSIE
DATE/TIME: 27/8/09 4PM	DATE/TIME: 27/8/09 1600	DATE/TIME:	DATE/TIME: 28-8-09 - 8:20a.m.

COMMENTS/ SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE: LAB ID	SAMPLE DETAILS MATRIX - SOLID (S), WATER (W): SAMPLE ID	DATE/ TIME	MATRIX	CONTAINER INFORMATION: TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	TPH BTEX	PAH	Metals 8	OCPs					Additional Information: Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
78	TPQA03	27/8/09	S	250mL JAR	1									
79	TPQA04													
80	TPQA05													
81	TPQA06													
(30)	TPQA07					X	X	X						
224321	TPQA08 – acknowledging J.B					X*	X*	X*						*FWD to Labmark
(31)	TPQA09					X	X	X						
224322	TPQA10 acknowledging J.B					X*	X*	X*						*FWD to Labmark
(32)	TPQA11					X	X	X	X					
82	TPQA12													
(1)	Comp 1													
(2)	Comp 2													
				TOTAL										

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

153819

Rec'd SL 28/8/09 @ 5:55pm

E044362

LabMark
ENVIRONMENTAL LABORATORIES

ilac-MRA NATA Accreditation No. 13542

Accredited for compliance with ISO/IEC 17025. The results of tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. NATA is a signatory to the APLAC mutual recognition arrangement for the mutual recognition of the equivalence of testing, calibration and inspection reports.

AQIS
AUSTRALIAN QUARANTINE AND INSPECTION SERVICE

SYDNEY License No. N0356.

Quarantine Approved Premises criteria 5.1 for quarantine containment level 1 (QCI) facilities. Class five criteria cover premises utilised for research, analysis and testing of biological material, soil, animal, plant and human products.

CUSTOMER CENTRIC - ANALYTICAL CHEMISTS

FINAL CERTIFICATE OF ANALYSIS - ENVIRONMENTAL DIVISION

Laboratory Report No: E044330
Client Name: GHD Pty Ltd (NSW)
Client Reference: 221454521
Contact Name: Alison Monkley
Chain of Custody No: 153812
Sample Matrix: SOIL

Cover Page 1 of 4
plus Sample Results

Date Received: 27/08/2009
Date Reported: 03/09/2009

This Final Certificate of Analysis consists of sample results, DQI's, method descriptions, laboratory definitions, and internationally recognised NATA accreditation and endorsement. The DQO compliance relates specifically to QA/QC results as performed as part of the sample analysis, and may provide an indication of sample result quality. Transfer of report ownership from Labmark to the client shall only occur once full & final payment has been settled and verified. All report copies may be retracted where full payment has not occured within the agreed settlement period.

QUALITY ASSURANCE CRITERIA

Accuracy:	matrix spike:	1 in first 5-20, then 1 every 20 samples
	lcs, crm, method:	1 per analytical batch
	surrogate spike:	addition per target organic method
Precision:	laboratory duplicate:	1 in first 5-10, then 1 every 10 samples
	laboratory triplicate:	re-extracted & reported when duplicate RPD values exceed acceptance criteria
Holding Times:	soils, waters:	Refer to LabMark Preservation & THT table VOC's 14 days water / soil VAC's 7 days water or 14 days acidified VAC's 14 days soil SVOC's 7 days water, 14 days soil Pesticides 7 days water, 14 days soil Metals 6 months general elements Mercury 28 days
Confirmation:	target organic analysis:	GC/MS, or confirmatory column
Sensitivity:	EQL:	Typically 2-5 x Method Detection Limit (MDL)

QUALITY CONTROL GLOBAL ACCEPTANCE CRITERIA (GAC)

Accuracy:	spike, lcs, crm surrogate:	general analytes 70% - 130% recovery phenol analytes 50% - 130% recovery organophosphorous pesticide analytes 60% - 130% recovery phenoxy acid herbicides, organotin 50% - 130% recovery
	anion/cation bal:	+/- 10% (0-3 meq/l), +/- 5% (>3 meq/l)
Precision:	method blank:	not detected >95% of the reported EQL
	duplicate lab RPD (metals):	0-30% (>10xEQL), 0-75% (5-10xEQL) 0-100% (<5xEQL)
	duplicate lab RPD:	0-50% (>10xEQL), 0-75% (5-10xEQL) 0-100% (<5xEQL)

QUALITY CONTROL ANALYTE SPECIFIC ACCEPTANCE CRITERIA (ASAC)

Accuracy:	spike, lcs, crm surrogate:	analyte specific recovery data <3xsd of historical mean
Uncertainty:	spike, lcs:	measurement calculated from historical analyte specific control charts

RESULT ANNOTATION

Data Quality Objective	s:	matrix spike recovery	p:	pending	bcs: batch specific lcs
Data Quality Indicator	d:	laboratory duplicate	lcs:	laboratory control sample	bmb: batch specific mb
Estimated Quantitation Limit	t:	laboratory triplicate	crm:	certified reference material	
not applicable	r:	RPD relative % difference	mb:	method blank	

Simon Mills
Quality Control (Report signatory)
simon.mills@labmark.com.au

Geoff Weir
Authorising Chemist (NATA signatory)
geoff.weir@labmark.com.au

Jeremy Truong
Authorising Chemist (NATA signatory)
jeremy.truong@labmark.com.au

NEPC GUIDELINE COMPLIANCE - DQO

1. GENERAL

A. Results relate specifically to samples as received. Sample results are not corrected for matrix spike, lcs, or surrogate recovery data.

B. EQL's are matrix dependant and may be increased due to sample dilution or matrix interference.

C. Laboratory QA/QC samples are specific to this project.

D. Inter-laboratory proficiency results are available upon request. NATA accreditation details available at www.nata.asn.au.

E. VOC spikes & surrogates added to samples during extraction, SVOC spikes & surrogates added prior to extraction.

F. Recovery data outside GAC limits shall be investigated and compared to ASAC (historical mean +/- 3sd). If recovery data <20%, then the relevant results for that compound are considered not reliable.

G. Recovery data (ms, surrogate, crm, lcs) outside ASAC limits shall initiate an investigative action. Anomolous QC data is examined in conjunction with other QC samples and a final decision whether to accept or reject results is provided by the professional judgement of the senior analyst. The USEPA-CLP National Functional Guidelines are referred to for specific recommendations.

H. Extraction (preparation) date refers to the date that sample preparation was initiated. Note that certain methods not requiring sample preparation (eg. VOCs in water, etc) may report a common extraction and analysis date.

I. LabMark shall maintain an official copy of this Certificate of Analysis for all tracable reference purposes.

2. CHAIN OF CUSTODY (COC) & SAMPLE RECEIPT NOTICE (SRN) REQUIREMENTS

A. SRN issued to client upon sample receipt & login verification.

B. Preservation & sampling date details specified on COC and SRN, unless noted.

C. Sample Integrity & Validated Time of Sample Receipt (VTSR) Holding Times verified (preservation may extend holding time, refer to preservation chart).

3. NATA ACCREDITED METHODS

A. NATA accreditation held for each in-house method and sample matrix type reported, unless noted below (Refer to subcontracted test reports for NATA accreditation status).

B. NATA accredited in-house laboratory methods are referenced from NEPC, ASTM, modified USEPA / APHA documents. Corporate Accreditation No. 13542.

C. Subcontracted analyses: Refer to Sample Receipt Notice and additional DQO comments.

4. QA/QC FREQUENCY COMPLIANCE TABLE SPECIFIC TO THIS REPORT

Matrix: **SOIL**

Page:	Method:	Totals:	#d	%d-ratio	#t	#s	%s-ratio
1	BTEX by P&T	1	0	0%	0	0	0%
1	Volatile TPH by P&T (vTPH)	1	0	0%	0	0	0%
2	Petroleum Hydrocarbons (TPH)	1	0	0%	0	0	0%
3	Polyaromatic Hydrocarbons (PAH)	1	0	0%	0	0	0%
4	Organochlorine Pesticides (OC)	1	0	0%	0	0	0%
5	Acid extractable metals (M7)	1	0	0%	0	0	0%
6	Acid extractable metals - mercury	1	0	0%	0	0	0%
7	Moisture	1	--	--	--	--	--

GLOSSARY:

#d	number of discrete duplicate extractions/analyses performed.
%d-ratio	NEPC guideline for laboratory duplicates is 1 in 10 samples (min 10%).
#t	number of triplicate extractions/analyses performed.
#s	number of spiked samples analysed.
%s-ratio	USEPA guideline for laboratory matrix spikes is 1 in 20 samples (min 5%).

5. ADDITIONAL COMMENTS SPECIFIC TO THIS REPORT

A. All tests were conducted by LabMark Environmental Sydney, NATA accreditation No. 13542, unless indicated below.

LabMark
ENVIRONMENTAL LABORATORIES

CUSTOMER CENTRIC - ANALYTICAL CHEMISTS

Environmental Laboratory Industry Group
Foundation Member

Laboratory Report: E044330

Cover Page 4 of 4

Laboratory QA/QC data shall relate specifically to this report, and may provide an indication of site specific sample result quality. LabMark DOES NOT report NON-RELEVANT BATCH QA/QC data. Acceptance of this self assessment certificate does not preclude any requirement for a QA/QC review by a accredited contaminated site EPA auditor, when and wherever necessary. Laboratory QA/QC self assessment references available upon request.

LabMark Environmental Laboratories ABN 30 008 127 802
* SYDNEY: Unit 1, 8 Leighton Place Asquith NSW 2077 * MELBOURNE: 1868 Dandenong Road, Clayton VIC 3168
* Telephone: (02) 9476 6533 * Fax: (02) 9476 8219 * Telephone: (03) 9538 2277 * Fax: (03) 9538 2278

LabMark
ENVIRONMENTAL LABORATORIES

Laboratory Report No: E044330
Client Name: GHD Pty Ltd (NSW)
Contact Name: Alison Monkley
Client Reference: 221454521

Page: 1 of 7
plus cover page
Date: 03/09/09
This report supercedes reports issued on: N/A

Final
Certificate
of Analysis

Laboratory Identification		**224031**	**lcs**	**mb**							
Sample Identification		TPQA02	QC	QC							
Depth (m)		--	--	--							
Sampling Date recorded on COC		26/8/09	--	--							
Laboratory Extraction (Preparation) Date		28/8/09	28/8/09	28/8/09							
Laboratory Analysis Date		29/8/09	28/8/09	28/8/09							
Method : E002.2											
BTEX by P&T	**EQL**										
Benzene	0.2	<0.2	92%	<0.2							
Toluene	0.5	<0.5	98%	<0.5							
Ethylbenzene	0.5	<0.5	92%	<0.5							
meta- and para-Xylene	1	<1	98%	<1							
ortho-Xylene	0.5	<0.5	92%	<0.5							
Total Xylene	--	--	--	--							
CDFB (Surr @ 10mg/kg)	--	*80%*	*116%*	*87%*							
Method : E003.2											
Volatile TPH by P&T (vTPH)	**EQL**										
C6 - C9 Fraction	10	<10	102%	<10							

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E002.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/PID/MSD.
E003.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/FID.

Laboratory Identification		**224031**	**lcs**	**mb**							
Sample Identification		TPQA02	QC	QC							
Depth (m)		--	--	--							
Sampling Date recorded on COC		26/8/09	--	--							
Laboratory Extraction (Preparation) Date		28/8/09	28/8/09	28/8/09							
Laboratory Analysis Date		28/8/09	28/8/09	28/8/09							
Method : E006.2											
Petroleum Hydrocarbons (TPH)	**EQL**										
C10 - C14 Fraction	50	<50	--	<50							
C15 - C28 Fraction	100	180	95%	<100							
C29 - C36 Fraction	100	<100	--	<100							
Sum of TPH C10 - C36	--	180	--	--							

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E006.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/FID.

Laboratory Identification		**224031**	**lcs**	**mb**							
Sample Identification		TPQA02	QC	QC							
Depth (m)		--	--	--							
Sampling Date recorded on COC		26/8/09	--	--							
Laboratory Extraction (Preparation) Date		28/8/09	28/8/09	28/8/09							
Laboratory Analysis Date		28/8/09	28/8/09	28/8/09							
Method : E007.2											
Polyaromatic Hydrocarbons (PAH)	**EQL**										
Naphthalene	0.5	<0.5	92%	<0.5							
Acenaphthylene	0.5	<0.5	113%	<0.5							
Acenaphthene	0.5	<0.5	94%	<0.5							
Fluorene	0.5	<0.5	92%	<0.5							
Phenanthrene	0.5	<0.5	92%	<0.5							
Anthracene	0.5	<0.5	98%	<0.5							
Fluoranthene	0.5	<0.5	89%	<0.5							
Pyrene	0.5	<0.5	90%	<0.5							
Benz(a)anthracene	0.5	<0.5	93%	<0.5							
Chrysene	0.5	<0.5	95%	<0.5							
Benzo(b)&(k)fluoranthene	1	<1	90%	<1							
Benzo(a) pyrene	0.5	<0.5	127%	<0.5							
Indeno(1,2,3-c,d)pyrene	0.5	<0.5	89%	<0.5							
Dibenz(a,h)anthracene	0.5	<0.5	96%	<0.5							
Benzo(g,h,i)perylene	0.5	<0.5	88%	<0.5							
Sum of reported PAHs	--	--	--	--							
2-FBP (Surr @ 5mg/kg)	--	*93%*	*98%*	*103%*							
TP-d14 (Surr @ 5mg/kg)	--	*95%*	*95%*	*102%*							

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E007.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/MS.

Laboratory Identification		**224031**	**lcs**	**mb**							
Sample Identification		TPQA02	QC	QC							
Depth (m)		--	--	--							
Sampling Date recorded on COC		26/8/09	--	--							
Laboratory Extraction (Preparation) Date		28/8/09	28/8/09	28/8/09							
Laboratory Analysis Date		29/8/09	28/8/09	28/8/09							
Method : E013.2											
Organochlorine Pesticides (OC)	**EQL**										
a-BHC	0.05	<0.05	115%	<0.05							
Hexachlorobenzene	0.05	<0.05	107%	<0.05							
b-BHC	0.05	<0.05	113%	<0.05							
g-BHC (Lindane)	0.05	<0.05	120%	<0.05							
d-BHC	0.05	<0.05	122%	<0.05							
Heptachlor	0.05	<0.05	118%	<0.05							
Aldrin	0.05	<0.05	115%	<0.05							
Heptachlor epoxide	0.05	<0.05	119%	<0.05							
trans-chlordane	0.05	<0.05	121%	<0.05							
Endosulfan I	0.05	<0.05	119%	<0.05							
cis-chlordane	0.05	<0.05	119%	<0.05							
Dieldrin	0.05	<0.05	108%	<0.05							
4,4-DDE	0.05	<0.05	104%	<0.05							
Endrin	0.05	<0.05	118%	<0.05							
Endosulfan II	0.05	<0.05	120%	<0.05							
4,4-DDD	0.05	<0.05	119%	<0.05							
Endosulfan sulphate	0.05	<0.05	92%	<0.05							
4,4-DDT	0.2	<0.2	120%	<0.2							
Methoxychlor	0.2	<0.2	122%	<0.2							
DBC (Surr @ 0.2mg/kg)	--	*84%*	*92%*	*86%*							

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E013.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/dual ECD.

Laboratory Identification		**224031**	**crm**	**lcs**	**mb**						
Sample Identification		TPQA02	QC	QC	QC						
Depth (m)		--	--	--	--						
Sampling Date recorded on COC		26/8/09	--	--	--						
Laboratory Extraction (Preparation) Date		28/8/09	28/8/09	28/8/09	28/8/09						
Laboratory Analysis Date		29/8/09	28/8/09	28/8/09	28/8/09						
Method : E022.2											
Acid extractable metals (M7)	**EQL**										
Arsenic	1	2	93%	87%	<1						
Cadmium	0.1	<0.1	90%	101%	<0.1						
Chromium	1	5	88%	80%	<1						
Copper	2	22	88%	81%	<2						
Nickel	1	24	89%	80%	<1						
Lead	2	6	94%	96%	<2						
Zinc	5	19	90%	87%	<5						

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E022.2: 0.5g digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification		**224031**	**crm**	**lcs**	**mb**						
Sample Identification		TPQA02	QC	QC	QC						
Depth (m)		--	--	--	--						
Sampling Date recorded on COC		26/8/09	--	--	--						
Laboratory Extraction (Preparation) Date		28/8/09	28/8/09	28/8/09	28/8/09						
Laboratory Analysis Date		31/8/09	28/8/09	28/8/09	28/8/09						
Method : E026.2											
Acid extractable metals - mercury	**EQL**										
Mercury	0.05	0.09	90%	98%	<0.05						

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Identification		**224031**									
Sample Identification		TPQA02									
Depth (m)		--									
Sampling Date recorded on COC		26/8/09									
Laboratory Extraction (Preparation) Date		28/8/09									
Laboratory Analysis Date		31/8/09									
Method : E005.2											
Moisture	**EQL**										
Moisture	--	10									

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

LabMark
ENVIRONMENTAL LABORATORIES

Report Date : 27/08/2009
Report Time : 6:51:32PM

Sample **Receipt** Notice (SRN) for **E044330**

Quality, Service, Support

Client Details		Laboratory Reference Information	
Client Name:	GHD Pty Ltd (NSW)	**Please have this information ready when contacting Labmark.**	
Client Phone:	02 4979 9999		
Client Fax:	02 4979 9988	**Laboratory Report:**	**E044330**
Contact Name:	Alison Monkley	**Quotation Number:**	- Not provided, standard prices apply
Contact Email:	alison.monkley@ghd.com.au	**Laboratory Address:**	Unit 1, 8 Leighton Pl. Asquith NSW 2077
Client Address:	PO Box 5403, Newcastle West NSW 2302	**Phone:**	61 2 9476 6533
		Fax:	61 2 9476 8219
Project Name:	221454521		
Project Number:	- Not provided -	**Sample Receipt Contact:**	Ros Schacht
CoC Serial Number:	153812	**Email:**	Ros.Schacht@labmark.com.au
Purchase Order:	- Not provided -	**Reporting Contact:**	Leanne Boag
Surcharge:	No surcharge applied (results by 6:30pm on due date)	**Email:**	leanne.boag@labmark.com.au
Sample Matrix:	SOIL		
Date Sampled (earliest date):	26/08/2009	**NATA Accreditation:**	13542
Date Samples Received:	27/08/2009	**TGA GMP License:**	185-336 (Sydney)
Date Sample Receipt Notice issued:	27/08/2009	**APVMA License:**	6105 (Sydney)
Date Preliminary Report Due:	03/09/2009	**AQIS Approval:**	NO356 (Sydney)
Client TAT Request Date:	03/09/2009	**AQIS Entry Permit:**	200521534 (Sydney)

Reporting Requirements: Electronic Data Download required: Yes

Invoice Number: 09EA5596

Sample Condition: COC received with samples. Report number and lab ID's defined on COC.
Samples received in good order .
Samples received with cooling media: Crushed ice .
Samples received chilled.
Security seals not used .
Sample container & chemical preservation suitable .

Comments:

Holding Times: Date received allows for sufficient time to meet Technical Holding Times.

Preservation: Chemical preservation of samples satisfactory for requested analytes.

Important Notes:

LabMark shall responsibly dispose of spent customer soil and water samples which includes the disintegration of the sample label. A sample disposal fee of $1.00 is applicable on all samples received by the laboratory regardless of whether they have undergone analytical testing. Sample disposal of environmental samples shall be 31 days (water) and 3 months (soil, HN03 preserved samples) after laboratory receipt, unless otherwise requested in writing by the client. Samples requested to be held in non-refrigerated storage shall incur $5.00/ sample/ 3 months. Additional refrigerated storage shall incur $30/ sample/ 3 months. Combination prices apply only if requested. Transfer of report ownership from LabMark to the client shall occur once full and final payment has been settled and verified. All report copies may be retracted where full payment does not occur within the agreed settlement period.

Analysis comments:

Subcontracted Analyses:

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au

LabMark
ENVIRONMENTAL LABORATORIES

Report Date : 27/08/2009
Report Time : 6:51:32PM

Sample **Receipt** Notice (SRN) for **E044330**

Quality, Service, Support

The table below represents LabMark's understanding and interpretation of the customer supplied sample COC request (refer to SRN comments section on first page for external subcontracting method details). Please confirm that your COC request has been entered correctly. Due to THT and TAT requirements, testing shall commence immediately as per this table, unless the customer intervenes with a correction prior to testing.

GRID REVIEW TABLE

				Requested Analysis																			
No.	**Date**	**Depth**	**Client Sample ID**	BTEX by P&T	Acid extractable metals - mercury	Acid extractable metals (M7)	Moisture	Organochlorine Pesticides (OC)	Polyaromatic Hydrocarbons (PAH)	PREP Not Reported	Petroleum Hydrocarbons (TPH)	Volatile TPH by P&T (vTPH)											
224031	26/08		TPQA02	●	●	●	●	●	●	●	●	●											
			Totals:	1	1	1	1	1	1	1	1	1											

'PREP Not Reported' refers to an internal laboratory instruction - client confirmation of this parameter is not required.

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au

LabMark
ENVIRONMENTAL LABORATORIES

Report Date : 27/08/2009
Report Time : 6:51:32PM

Sample **Receipt** Notice (SRN) for **E044330**

Quality, Service, Support

No.	Date	Depth	Client Sample ID	Requested Analysis: M8 - M7-T_S																		
224031	26/08		TPQA02	●																		
			Totals:	1																		

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au

EO44330

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney**: 277 Woodpark Rd, Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsenviro.com
☐ **Newcastle**: 5 Rosegum Rd, Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com
☐ **Brisbane**: 32 Shand St, Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com
☐ **Townsville**: 14-15 Desma Ct, Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com
☐ **Melbourne**: 2-4 Westall Rd, Springvale, VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsenviro.com
☐ **Adelaide**: 2/1 Burma Rd, Pooraka SA 5095 Ph:08 8359 0890 E: adelaide@alsenviro.com
☐ **Perth**: 10 Hod Way, Malaga, WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ **Launceston**: 27 Wellington St, Launceston, TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: GHD
OFFICE: NEWCASTLE
PROJECT: 22145421
PURCHASE ORDER NUMBER:
PROJECT MANAGER: Alison Markley
SAMPLER: Jesse Simkus
SAMPLER MOBILE: 0404542354
COC emailed to ALS? (YES / NO)
EDD FORMAT (or default):
Email Reports to (will default to PM if no other addresses are listed): Jesse Simkus
Email Invoice to (will default to PM if no other addresses are listed): Melissa Simpson

TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)
☐ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.:
CONTACT PH:

COC SEQUENCE NUMBER (Circle)
COC: 1 2 (3) 4 5 6 7
OF: 1 2 (3) 4 5 6 7

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

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Rhys Holmewood	Hayley Wolfe	Hayley Wolfe	
DATE/TIME: 26/8/09 4pm	DATE/TIME: Mid West 26/8/09 4pm	DATE/TIME: Mid West 27/8/09 5pm	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	TPH BTEX	PAHs	Metals N-Z	OCPs	PCBs				
9	TP214.77 0.0M	26/8/09	S	250mL JAR	1			X	X					
(9)	TP214.77 0.5M													
10	TP214.70 0.0M							X	X					
(28)	TP214.70 0.5M													
11	TP214.66 0.0M							X	X					
(29)	TP214.66 0.3M													
12	TPQA01					X	X	X	X					
224031	TPQA02					X*	X*	X*	X*					*FWD to Labmark
				TOTAL										

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

153812

Relinquished: Frank (ALS) 27/8/09 10:30am
rec'd SR 27/8/09 @ 2:45pm.

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **ES0915511**		
Client	: **GHD SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR JESSE SIMKUS	Contact	: Charlie Pierce
Address	: PO BOX 5403 NEWCASTLE WEST NSW, AUSTRALIA 2302	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jesse.simkus@ghd.com.au	E-mail	: charlie.pierce@alsenviro.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 221454521	Page	: 1 of 2
Order number	: ----		
C-O-C number	: 153838	Quote number	: EM2009GHDSER0392 (EN/005/09)
Site	: ----		
Sampler	: ----	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 14-OCT-2009	Issue Date	: 15-OCT-2009 10:17
Client Requested Due Date	: 16-OCT-2009	Scheduled Reporting Date	: **16-OCT-2009**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 6.7' C SYD - Ice present
No. of coolers/boxes	: 1 HARD	No. of samples received	: 3
Sercurity Seal	: Intact.	No. of samples analysed	: 3

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times.**
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Please direct any queries related to sample condition / numbering / breakages to Jacob Waugh
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (90 days) from date of completion of work order.

Sample Container(s)/Preservation Non-Compliances

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

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process neccessary 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.
When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	SOIL - EP071-(SV) TPH(SV) Standard Limits of Reporting	SOIL - EP075 SIM PAH only SIM - PAH only	SOIL - S-02 8 Metals (incl. Digestion)
ES0915511-001	[14-OCT-2009]	SS215.315	✓	✓	✓
ES0915511-002	[14-OCT-2009]	SS221.000 OLD	✓	✓	✓
ES0915511-003	[14-OCT-2009]	SS221.000 NEW	✓	✓	✓

Requested Deliverables

MR JESSE SIMKUS

- *AU Certificate of Analysis - NATA (COA)	Email	jesse.simkus@ghd.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	jesse.simkus@ghd.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	jesse.simkus@ghd.com.au
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	jesse.simkus@ghd.com.au
- Default - Chain of Custody (COC)	Email	jesse.simkus@ghd.com.au
- EDI Format - ENMRG (ENMRG)	Email	jesse.simkus@ghd.com.au
- EDI Format - ESDAT (ESDAT)	Email	jesse.simkus@ghd.com.au
- EDI Format - GHDNEW (GHDNEW)	Email	jesse.simkus@ghd.com.au

MS MELISSA SIMPSON

- A4 - AU Tax Invoice (INV)	Email	Melissa.Simpson@ghd.com.au

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES0915511**	Page	: 1 of 5
Client	: GHD SERVICES PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: MR JESSE SIMKUS	Contact	: Charlie Pierce
Address	: PO BOX 5403 NEWCASTLE WEST NSW, AUSTRALIA 2302	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jesse.simkus@ghd.com.au	E-mail	: charlie.pierce@alsenviro.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 221454521	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: 153838	Date Samples Received	: 14-OCT-2009
Sampler	: ----	Issue Date	: 16-OCT-2009
Order number	: ----		
		No. of samples received	: 3
Quote number	: EN/005/09	No. of samples analysed	: 3

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non -volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

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							
Soil Glass Jar - Unpreserved							
SS215.315, SS221.000 OLD, SS221.000 NEW	**14-OCT-2009**	**----**	----	----	**15-OCT-2009**	21-OCT-2009	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved							
SS215.315, SS221.000 OLD, SS221.000 NEW	**14-OCT-2009**	**15-OCT-2009**	11-NOV-2009	✓	**16-OCT-2009**	12-APR-2010	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved							
SS215.315, SS221.000 OLD, SS221.000 NEW	**14-OCT-2009**	**15-OCT-2009**	11-NOV-2009	✓	**16-OCT-2009**	11-NOV-2009	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved							
SS215.315, SS221.000 OLD, SS221.000 NEW	**14-OCT-2009**	**15-OCT-2009**	28-OCT-2009	✓	**15-OCT-2009**	24-NOV-2009	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved							
SS215.315, SS221.000 OLD, SS221.000 NEW	**14-OCT-2009**	**15-OCT-2009**	28-OCT-2009	✓	**15-OCT-2009**	24-NOV-2009	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	17	**5.9**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	17	**5.9**	**5.0**	✓	ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (1999) Schedule B(3) (Method 102)
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) 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 (1999) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 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 (1999) Schedule B(3)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. 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 (1999) Schedule B(3) (Method 202)
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1305370-007	----	**Naphthalene**	91-20-3	77.6 %	81.9-113%	**Recovery less than lower control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1305370-007	----	**Acenaphthylene**	208-96-8	78.1 %	79.6-113%	**Recovery less than lower control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1305370-007	----	**Acenaphthene**	83-32-9	77.9 %	81.5-112%	**Recovery less than lower control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1305370-007	----	**Chrysene**	218-01-9	78.2 %	79.8-114%	**Recovery less than lower control limit**

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Matrix Spike outliers occur.**

Regular Sample Surrogates

Sub-Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP075(SIM)T: PAH Surrogates	ES0915511-002	SS221.000 OLD	**2-Fluorobiphenyl**	321-60-8	115 %	30-115 %	**Recovery greater than upper data quality objective**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

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

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

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

QUALITY CONTROL REPORT

Work Order	: **ES0915511**	Page	: 1 of 6
Client	: **GHD SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR JESSE SIMKUS	Contact	: Charlie Pierce
Address	: PO BOX 5403 NEWCASTLE WEST NSW, AUSTRALIA 2302	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jesse.simkus@ghd.com.au	E-mail	: charlie.pierce@alsenviro.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 221454521	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: 153838	Date Samples Received	: 14-OCT-2009
Sampler	: ----	Issue Date	: 16-OCT-2009
Order number	: ----		
		No. of samples received	: 3
Quote number	: EN/005/09	No. of samples analysed	: 3

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

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

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Spectroscopist	Inorganics
Edwandy Fadjar	Senior Organic Chemist	Organics
Victor Kedicioglu	Business Manager - NSW	Inorganics

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 insuffient sample for analysis.

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

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

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 (QC Lot: 1132125)									
ES0915423-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	11.6	11.4	2.1	0% - 50%
ES0915510-005	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	21.4	20.1	6.3	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 1132551)									
ES0915510-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	60	58	3.0	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	46	46	0.0	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	28	28	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	48	47	2.6	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	60	61	2.0	0% - 50%
ES0915510-007	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	63	69	9.0	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	57	64	11.9	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	29	32	9.5	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	31	24	25.5	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	68	77	12.4	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1132552)									
ES0915510-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.1	0.0	No Limit
ES0915510-007	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1132515)									
ES0915510-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

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: 1132515) - continued									
ES0915510-001	Anonymous	EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES0915511-003	SS221.000 NEW	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1132514)									
ES0915510-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	510	600	14.8	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	700	860	19.9	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES0915511-003	SS221.000 NEW	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method 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: 1132551)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.1 mg/kg	112	90.1	124
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.76 mg/kg	96.0	83.3	111
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.9 mg/kg	111	89.2	117
EG005T: Copper	7440-50-8	5	mg/kg	<5	54.7 mg/kg	92.4	90.1	114
EG005T: Lead	7439-92-1	5	mg/kg	<5	55.2 mg/kg	107	85.2	111
EG005T: Nickel	7440-02-0	2	mg/kg	<2	54.8 mg/kg	111	88.3	116
EG005T: Zinc	7440-66-6	5	mg/kg	<5	104 mg/kg	103	88.9	112
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1132552)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.4 mg/kg	75.8	67	118
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1132515)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	# 77.6	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	# 78.1	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	# 77.9	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	101	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	97.4	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	85.6	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	88.6	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	90.0	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	82.5	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	# 78.2	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	92.5	71.8	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	83.8	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	79.6	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	78.5	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	81.4	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	79.3	72.4	114
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1132514)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	109	75.2	116
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	200 mg/kg	94.0	75.3	113
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	86.0	72.6	117

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 1132551)							
ES0915510-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	82.0	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	98.2	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	92.2	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	89.5	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	102	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	95.9	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	98.1	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1132552)							
ES0915510-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	81.0	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1132515)							
ES0915510-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	104	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	72.9	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1132514)							
ES0915510-001	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	95.0	70	130
		EP071: C15 - C28 Fraction	----	3140 mg/kg	84.2	70	130
		EP071: C29 - C36 Fraction	----	2860 mg/kg	85.1	70	130

CERTIFICATE OF ANALYSIS

Work Order	: **ES0915511**	Page	: 1 of 5
Client	: **GHD SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR JESSE SIMKUS	Contact	: Charlie Pierce
Address	: PO BOX 5403 NEWCASTLE WEST NSW, AUSTRALIA 2302	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jesse.simkus@ghd.com.au	E-mail	: charlie.pierce@alsenviro.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 221454521	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: 153838	Date Samples Received	: 14-OCT-2009
Sampler	: ----	Issue Date	: 16-OCT-2009
Site	: ----		
		No. of samples received	: 3
Quote number	: EN/005/09	No. of samples analysed	: 3

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Spectroscopist	Inorganics
Edwandy Fadjar	Senior Organic Chemist	Organics
Victor Kedicioglu	Business Manager - NSW	Inorganics

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 insuffient 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 date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

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

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID	SS215.315	SS221.000 OLD	SS221.000 NEW	----	----
				Client sampling date / time	[14-OCT-2009]	[14-OCT-2009]	[14-OCT-2009]	----	----
					ES0915511-001	ES0915511-002	ES0915511-003	----	----
EA055: Moisture Content									
^ Moisture Content (dried @ 103°C)	----	1.0	%		**8.4**	**17.7**	**37.8**	----	----
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		**8**	**11**	**11**	----	----
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	----	----
Chromium	7440-47-3	2	mg/kg		**35**	**13**	**14**	----	----
Copper	7440-50-8	5	mg/kg		**12**	**12**	**12**	----	----
Lead	7439-92-1	5	mg/kg		**14**	**14**	**15**	----	----
Nickel	7440-02-0	2	mg/kg		**18**	**15**	**16**	----	----
Zinc	7440-66-6	5	mg/kg		**53**	**50**	**53**	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
EP080/071: Total Petroleum Hydrocarbons									
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		**89.4**	**99.0**	**77.6**	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%		**88.8**	**97.8**	**85.0**	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%		**67.3**	**61.5**	**88.7**	----	----

Analytical Results

Sub-Matrix: SOIL				Client sample ID	SS215.315	SS221.000 OLD	SS221.000 NEW	----	----
				Client sampling date / time	[14-OCT-2009]	[14-OCT-2009]	[14-OCT-2009]	----	----
Compound	CAS Number	LOR	Unit		ES0915511-001	ES0915511-002	ES0915511-003	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**104**	**115**	**92.9**	----	----
Anthracene-d10	1719-06-8	0.1	%		**97.8**	**99.1**	**80.7**	----	----
4-Terphenyl-d14	1718-51-0	0.1	%		**128**	**131**	**122**	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	24	113
2-Chlorophenol-D4	93951-73-6	23	134
2.4.6-Tribromophenol	118-79-6	19	122
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	30	115
Anthracene-d10	1719-06-8	27	133
4-Terphenyl-d14	1718-51-0	18	137

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney**: 277 Woodpark Rd, Smithfield NSW 2164 Ph 02 8784 8555 E: samples.sydney@alsenviro.com

☑ **Newcastle**: 5 Rosegum Rd, Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com

☐ **Brisbane**: 32 Shand St, Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com

☐ **Townsville**: 14-15 Desma Ct, Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com

☐ **Melbourne**: 2-4 Westall Rd, Springvale, VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsenviro.com

☐ **Adelaide**: 2/1 Burma Rd, Pooraka SA 5095 Ph:08 8359 0890 E: adelaide@alsenviro.com

☐ **Perth**: 10 Hod Way, Malaga, WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com

☐ **Launceston**: 27 Wellington St, Launceston, TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: GHD	**TURNAROUND REQUIREMENTS:** (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☐ Standard TAT (List due date): ☑ Non Standard or urgent TAT (List due date): 16/10/09	**FOR LABORATORY USE ONLY (Circle)** Custody Seal Intact? Yes No N/A
OFFICE: NEWCASTLE			Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: 22145452 1	**ALS QUOTE NO.:**	COC SEQUENCE NUMBER (Circle) COC: (1) 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PURCHASE ORDER NUMBER:		OF: (1) 2 3 4 5 6 7	Other comment:
PROJECT MANAGER: J. SIMKUS	**CONTACT PH:**		
SAMPLER: J. SIMKUS	**SAMPLER MOBILE:** 0404542354	**RELINQUISHED BY:** J.S.	**RECEIVED BY:** Hayley Wolfe Monaco
COC emailed to ALS? (YES / NO)	**EDD FORMAT** (or default):	DATE/TIME: 14/10/09 12:40	DATE/TIME: 14/10/09 12:40
Email Reports to (will default to PM if no other addresses are listed):		**RELINQUISHED BY:** Hayley Wolfe Monaco	**RECEIVED BY:** FAST
Email Invoice to (will default to PM if no other addresses are listed):		DATE/TIME: 14/10/09 4pm	DATE/TIME: 15/10/9 8:30a

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	S-2	PAH	TPH C10-C36							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	SS215.315	14/10/09	S	250mL JAR	1	X	X	X							
2	SS221.000 OLD	↓	↓	↓	↓	X	X	XX							
3	SS221.000 NEW	↓	↓	↓	↓	X	X	X							
				TOTAL											

Environmental Division
Sydney
Work Order
ES0915511

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.

153838

prelogged by PI

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **ES0912886**

Client	: **GHD SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR JESSE SIMKUS	Contact	: Charlie Pierce
Address	: PO BOX 5403 NEWCASTLE WEST NSW, AUSTRALIA 2302	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jesse.simkus@ghd.com.au	E-mail	: charlie.pierce@alsenviro.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 221454521	Page	: 1 of 4
Order number	: ----		
C-O-C number	: ----	Quote number	: EM2009GHDSER0392 (EN/005/09)
Site	: ----		
Sampler	: JS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 27-AUG-2009	Issue Date	: 28-AUG-2009 15:10
Client Requested Due Date	: 31-AUG-2009	Scheduled Reporting Date	: **02-SEP-2009**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 5.8'C - Ice bricks present
No. of coolers/boxes	: 1 HARD	No. of samples received	: 80
Sercurity Seal	: Intact.	No. of samples analysed	: 30

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Sample TPQA08 and TPQA10 will be forwarded to Labmark as per COC.**
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Please direct any queries related to sample condition / numbering / breakages to Jacob Waugh
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (90 days) from date of completion of work order.

Sample Container(s)/Preservation Non-Compliances

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

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process neccessary 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.
When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EP068A (solids) Organochlorine Pesticides by GCMS	SOIL - NT-11S Total N + Total P	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-07 TPH/BTEX/PAH (SIM)
ES0912886-001	27-AUG-2009 15:00	COMPOSITE 1		✓	✓			
ES0912886-002	27-AUG-2009 15:00	COMPOSITE 2		✓	✓			
ES0912886-003	27-AUG-2009 15:00	TP223.50 0.0M					✓	
ES0912886-004	27-AUG-2009 15:00	TP223.40B 0.3M					✓	
ES0912886-005	27-AUG-2009 15:00	TP223.40A 0.0M					✓	
ES0912886-006	27-AUG-2009 15:00	TP223.30 0.0M					✓	
ES0912886-007	27-AUG-2009 15:00	TP223.20 0.0M					✓	
ES0912886-008	27-AUG-2009 15:00	TP223.10 0.3M					✓	
ES0912886-009	27-AUG-2009 15:00	TP223.00 0.0M					✓	
ES0912886-010	27-AUG-2009 15:00	TP208.37 0.3M				✓	✓	✓
ES0912886-011	27-AUG-2009 15:00	TP208.27 0.0M				✓	✓	✓
ES0912886-012	27-AUG-2009 15:00	TP208.17 0.0M				✓	✓	✓
ES0912886-013	27-AUG-2009 15:00	TP208.D7 0.0M				✓	✓	✓
ES0912886-014	27-AUG-2009 15:00	TP207.97 0.0M				✓	✓	✓
ES0912886-015	27-AUG-2009 15:00	TP203.68 0.5M		✓	✓		✓	
ES0912886-016	27-AUG-2009 15:00	TP117.58 0.0M					✓	✓
ES0912886-017	27-AUG-2009 15:00	TP197.55 0.0M					✓	✓
ES0912886-018	27-AUG-2009 15:00	TP197.54 0.0M					✓	✓
ES0912886-019	27-AUG-2009 15:00	TP197.40 0.0M			✓		✓	✓
ES0912886-020	27-AUG-2009 15:00	TP197.30 0.5M			✓		✓	✓
ES0912886-021	27-AUG-2009 15:00	TP197.20 1.0M			✓		✓	✓
ES0912886-022	27-AUG-2009 15:00	TP197.10 0.0M			✓		✓	✓
ES0912886-023	27-AUG-2009 15:00	TP197.00 0.5M			✓		✓	✓
ES0912886-024	27-AUG-2009 15:00	TP196.90 1.5M			✓		✓	✓
ES0912886-025	27-AUG-2009 15:00	TP196.80 0.0M			✓		✓	✓
ES0912886-026	27-AUG-2009 15:00	TP196.70 1.5M			✓		✓	✓
ES0912886-027	27-AUG-2009 15:00	TP196.60 0.5M			✓		✓	✓
ES0912886-028	27-AUG-2009 15:00	TPQA07					✓	✓
ES0912886-029	27-AUG-2009 15:00	TPQA09					✓	✓
ES0912886-030	27-AUG-2009 15:00	TPQA11			✓		✓	✓
ES0912886-031	27-AUG-2009 15:00	TP223.50 0.3M	✓					
ES0912886-032	27-AUG-2009 15:00	TP223.40B 0.0M	✓					
ES0912886-033	27-AUG-2009 15:00	TP223.40A 0.3M	✓					
ES0912886-034	27-AUG-2009 15:00	TP223.30 0.3M	✓					
ES0912886-035	27-AUG-2009 15:00	TP223.20 0.3M	✓					

			(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EP068A (solids) Organochlorine Pesticides by GCMS	SOIL - NT-11S Total N + Total P	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-07 TPH/BTEX/PAH (SIM)
ES0912886-036	27-AUG-2009 15:00	TP223.10 0.0M	✓					
ES0912886-037	27-AUG-2009 15:00	TP223.00 0.3M	✓					
ES0912886-038	27-AUG-2009 15:00	TP208.37 0.0M	✓					
ES0912886-039	27-AUG-2009 15:00	TP208.27 0.5M	✓					
ES0912886-040	27-AUG-2009 15:00	TP208.17 0.3M	✓					
ES0912886-041	27-AUG-2009 15:00	TP208.07 0.3M	✓					
ES0912886-042	27-AUG-2009 15:00	TP207.97 0.3M	✓					
ES0912886-043	27-AUG-2009 15:00	TP203.68 0.0M	✓					
ES0912886-044	27-AUG-2009 15:00	TP203.68 1.0M	✓					
ES0912886-045	27-AUG-2009 15:00	TP203.68 1.5M	✓					
ES0912886-046	27-AUG-2009 15:00	TP197.58 0.3M	✓					
ES0912886-047	27-AUG-2009 15:00	TP197.55 0.3M	✓					
ES0912886-048	27-AUG-2009 15:00	TP197.54 0.3M	✓					
ES0912886-049	27-AUG-2009 15:00	TP197.40 0.5M	✓					
ES0912886-050	27-AUG-2009 15:00	TP197.40 1.0M	✓					
ES0912886-051	27-AUG-2009 15:00	TP197.40 1.5M	✓					
ES0912886-052	27-AUG-2009 15:00	TP197.30 0.0M	✓					
ES0912886-053	27-AUG-2009 15:00	TP197.30 1.0M	✓					
ES0912886-054	27-AUG-2009 15:00	TP197.30 1.5M	✓					
ES0912886-055	27-AUG-2009 15:00	TP197.20 0.0M	✓					
ES0912886-056	27-AUG-2009 15:00	TP197.20 0.5M	✓					
ES0912886-057	27-AUG-2009 15:00	TP197.20 1.5M	✓					
ES0912886-058	27-AUG-2009 15:00	TP197.10 0.5M	✓					
ES0912886-059	27-AUG-2009 15:00	TP197.10 1.0M	✓					
ES0912886-060	27-AUG-2009 15:00	TP197.10 1.5M	✓					
ES0912886-061	27-AUG-2009 15:00	TP197.00 0.0M	✓					
ES0912886-062	27-AUG-2009 15:00	TP197.00 1.0M	✓					
ES0912886-063	27-AUG-2009 15:00	TP197.00 1.5M	✓					
ES0912886-064	27-AUG-2009 15:00	TP196.90 0.0M	✓					
ES0912886-065	27-AUG-2009 15:00	TP196.90 0.5M	✓					
ES0912886-066	27-AUG-2009 15:00	TP196.90 1.0M	✓					
ES0912886-067	27-AUG-2009 15:00	TP196.80 0.0M	✓					
ES0912886-068	27-AUG-2009 15:00	TP196.80 1.0M	✓					
ES0912886-069	27-AUG-2009 15:00	TP196.80 1.5M	✓					
ES0912886-070	27-AUG-2009 15:00	TP196.70 0.0M	✓					
ES0912886-071	27-AUG-2009 15:00	TP196.70 0.5M	✓					
ES0912886-072	27-AUG-2009 15:00	TP196.70 1.0M	✓					
ES0912886-073	27-AUG-2009 15:00	TP196.60 0.0M	✓					
ES0912886-074	27-AUG-2009 15:00	TP196.60 1.0M	✓					
ES0912886-075	27-AUG-2009 15:00	TP196.60 1.5M	✓					
ES0912886-076	27-AUG-2009 15:00	TPQA03	✓					

			(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EP068A (solids) Organochlorine Pesticides by GCMS	SOIL - NT-11S Total N + Total P	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-07 TPH/BTEX/PAH (SIM)
ES0912886-077	27-AUG-2009 15:00	TPQA04	✓					
ES0912886-078	27-AUG-2009 15:00	TPQA05	✓					
ES0912886-079	27-AUG-2009 15:00	TPQA06	✓					
ES0912886-080	27-AUG-2009 15:00	TPQA12	✓					

Requested Deliverables

MR JESSE SIMKUS

- *AU Certificate of Analysis - NATA (COA)	Email	jesse.simkus@ghd.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	jesse.simkus@ghd.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	jesse.simkus@ghd.com.au
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	jesse.simkus@ghd.com.au
- Default - Chain of Custody (COC)	Email	jesse.simkus@ghd.com.au
- EDI Format - ENMRG (ENMRG)	Email	jesse.simkus@ghd.com.au
- EDI Format - ESDAT (ESDAT)	Email	jesse.simkus@ghd.com.au
- EDI Format - GHDNEW (GHDNEW)	Email	jesse.simkus@ghd.com.au

MS ALISON MONKLEY

- *AU Certificate of Analysis - NATA (COA)	Email	alison.monkley@ghd.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	alison.monkley@ghd.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	alison.monkley@ghd.com.au
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	alison.monkley@ghd.com.au
- Default - Chain of Custody (COC)	Email	alison.monkley@ghd.com.au
- EDI Format - ENMRG (ENMRG)	Email	alison.monkley@ghd.com.au
- EDI Format - ESDAT (ESDAT)	Email	alison.monkley@ghd.com.au
- EDI Format - GHDNEW (GHDNEW)	Email	alison.monkley@ghd.com.au

MS MELISSA SIMPSON

- A4 - AU Tax Invoice (INV)	Email	Melissa.Simpson@ghd.com.au

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES0912886**	Page	: 1 of 10
Client	: GHD SERVICES PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: MR JESSE SIMKUS	Contact	: Charlie Pierce
Address	: PO BOX 5403 NEWCASTLE WEST NSW, AUSTRALIA 2302	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jesse.simkus@ghd.com.au	E-mail	: charlie.pierce@alsenviro.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 221454521	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 27-AUG-2009
Sampler	: JS	Issue Date	: 01-SEP-2009
Order number	: ----		
		No. of samples received	: 82
Quote number	: EN/005/09	No. of samples analysed	: 30

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non-volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

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								
Soil Glass Jar - Unpreserved								
COMPOSITE 1,	COMPOSITE 2,	**27-AUG-2009**	**----**	----	----	**28-AUG-2009**	03-SEP-2009	✓
TP223.50 0.0M,	TP223.40B 0.3M,							
TP223.40A 0.0M,	TP223.30 0.0M,							
TP223.20 0.0M,	TP223.10 0.3M,							
TP223.00 0.0M,	TP208.37 0.3M,							
TP208.27 0.0M,	TP208.17 0.0M,							
TP208.D7 0.0M,	TP207.97 0.0M,							
TP203.68 0.5M,	TP197.58 0.0M,							
TP197.55 0.0M,	TP197.54 0.0M,							
TP197.40 0.0M,	TP197.30 0.5M,							
TP197.20 1.0M,	TP197.10 0.0M,							
TP197.00 0.5M,	TP196.90 1.5M,							
TP196.80 0.0M,	TP196.70 1.5M,							
TP196.60 0.5M,	TPQA07,							
TPQA09,	TPQA11							

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
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved							
TP223.50 0.0M, TP223.40B 0.3M, TP223.40A 0.0M, TP223.30 0.0M, TP223.20 0.0M, TP223.10 0.3M, TP223.00 0.0M, TP208.37 0.3M, TP208.27 0.0M, TP208.17 0.0M, TP208.D7 0.0M, TP207.97 0.0M, TP203.68 0.5M, TP197.58 0.0M, TP197.55 0.0M, TP197.54 0.0M, TPQA07, TP197.40 0.0M, TP197.30 0.5M, TP197.20 1.0M, TP197.10 0.0M, TP197.00 0.5M, TP196.90 1.5M, TP196.80 0.0M, TP196.70 1.5M, TP196.60 0.5M, TPQA09, TPQA11	**27-AUG-2009**	**29-AUG-2009**	24-SEP-2009	✓	**31-AUG-2009**	23-FEB-2010	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved							
TP223.50 0.0M, TP223.40B 0.3M, TP223.40A 0.0M, TP223.30 0.0M, TP223.20 0.0M, TP223.10 0.3M, TP223.00 0.0M, TP208.37 0.3M, TP208.27 0.0M, TP208.17 0.0M, TP208.D7 0.0M, TP207.97 0.0M, TP203.68 0.5M, TP197.58 0.0M, TP197.55 0.0M, TP197.54 0.0M, TPQA07, TP197.40 0.0M, TP197.30 0.5M, TP197.20 1.0M, TP197.10 0.0M, TP197.00 0.5M, TP196.90 1.5M, TP196.80 0.0M, TP196.70 1.5M, TP196.60 0.5M, TPQA09, TPQA11	**27-AUG-2009**	**29-AUG-2009**	24-SEP-2009	✓	**31-AUG-2009**	24-SEP-2009	✓
EK059G: NOX as N by Discrete Analyser							
Soil Glass Jar - Unpreserved							
TP208.37 0.3M, TP208.27 0.0M, TP208.17 0.0M	**27-AUG-2009**	**28-AUG-2009**	23-FEB-2010	✓	**28-AUG-2009**	23-FEB-2010	✓
Soil Glass Jar - Unpreserved							
TP208.D7 0.0M, TP207.97 0.0M	**27-AUG-2009**	**28-AUG-2009**	23-FEB-2010	✓	**31-AUG-2009**	23-FEB-2010	✓

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
EK061G: Total Kjeldahl Nitrogen as N							
Soil Glass Jar - Unpreserved							
TP208.37 0.3M, TP208.27 0.0M, TP208.17 0.0M, TP208.D7 0.0M, TP207.97 0.0M	**27-AUG-2009**	**31-AUG-2009**	23-FEB-2010	✓	**31-AUG-2009**	23-FEB-2010	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Soil Glass Jar - Unpreserved							
TP208.37 0.3M, TP208.27 0.0M, TP208.17 0.0M, TP208.D7 0.0M, TP207.97 0.0M	**27-AUG-2009**	**31-AUG-2009**	23-FEB-2010	✓	**31-AUG-2009**	23-FEB-2010	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved							
COMPOSITE 1, COMPOSITE 2, TP203.68 0.5M, TP197.40 0.0M, TP197.30 0.5M, TP197.20 1.0M, TP197.10 0.0M, TP197.00 0.5M, TP196.90 1.5M, TP196.80 0.0M, TP196.70 1.5M, TP196.60 0.5M, TPQA11	**27-AUG-2009**	**28-AUG-2009**	10-SEP-2009	✓	**31-AUG-2009**	07-OCT-2009	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved							
TP208.37 0.3M, TP208.27 0.0M, TP208.17 0.0M, TP208.D7 0.0M, TP207.97 0.0M, TP197.58 0.0M, TP197.55 0.0M, TP197.54 0.0M, TP197.40 0.0M, TP197.30 0.5M, TP197.20 1.0M, TP197.10 0.0M, TP197.00 0.5M, TP196.90 1.5M, TP196.80 0.0M, TP196.70 1.5M, TPQA07, TP196.60 0.5M, TPQA09, TPQA11	**27-AUG-2009**	**28-AUG-2009**	10-SEP-2009	✓	**31-AUG-2009**	07-OCT-2009	✓

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
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved							
TP208.37 0.3M, TP208.27 0.0M, TP208.17 0.0M, TP207.97 0.0M, TP197.58 0.0M, TP197.55 0.0M, TP197.54 0.0M, TP197.40 0.0M, TP197.30 0.5M, TP197.20 1.0M, TP197.10 0.0M, TP197.00 0.5M, TP196.90 1.5M, TP196.80 0.0M, TP196.70 1.5M, TP196.60 0.5M, TPQA07	**27-AUG-2009**	**28-AUG-2009**	10-SEP-2009	✓	**29-AUG-2009**	10-SEP-2009	✓
Soil Glass Jar - Unpreserved							
TP208.37 0.3M, TP208.27 0.0M, TP208.17 0.0M, TP208.D7 0.0M, TP207.97 0.0M, TP197.58 0.0M, TP197.55 0.0M, TP197.54 0.0M, TP197.40 0.0M, TP197.30 0.5M, TP197.20 1.0M, TP197.10 0.0M, TP197.00 0.5M, TP196.90 1.5M, TP196.80 0.0M, TP196.70 1.5M, TPQA07, TP196.60 0.5M, TPQA09, TPQA11	**27-AUG-2009**	**28-AUG-2009**	10-SEP-2009	✓	**31-AUG-2009**	10-SEP-2009	✓
EP080: BTEX							
Soil Glass Jar - Unpreserved							
TP208.37 0.3M, TP208.27 0.0M, TP208.17 0.0M, TP207.97 0.0M, TP197.58 0.0M, TP197.55 0.0M, TP197.54 0.0M, TP197.40 0.0M, TP197.30 0.5M, TP197.20 1.0M, TP197.10 0.0M, TP197.00 0.5M, TP196.90 1.5M, TP196.80 0.0M, TP196.70 1.5M, TP196.60 0.5M, TPQA07	**27-AUG-2009**	**28-AUG-2009**	10-SEP-2009	✓	**29-AUG-2009**	10-SEP-2009	✓
Soil Glass Jar - Unpreserved							
TP208.D7 0.0M, TPQA09, TPQA11	**27-AUG-2009**	**28-AUG-2009**	10-SEP-2009	✓	**31-AUG-2009**	10-SEP-2009	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	6	47	**12.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	2	8	**25.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	3	25	**12.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	3	16	**18.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TKN as N By Discrete Analyser	EK061G	1	5	**20.0**	**9.5**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	4	34	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	4	39	**10.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Phosporus By Discrete Analyser	EK067G	2	13	**15.4**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	3	25	**12.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	3	25	**12.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	2	8	**25.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	25	**8.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	2	16	**12.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TKN as N By Discrete Analyser	EK061G	1	5	**20.0**	**4.8**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	34	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	39	**5.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Phosporus By Discrete Analyser	EK067G	1	13	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	25	**8.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	25	**8.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	2	8	**25.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	25	**8.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	2	16	**12.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TKN as N By Discrete Analyser	EK061G	1	5	**20.0**	**4.8**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	34	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	39	**5.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Phosporus By Discrete Analyser	EK067G	1	13	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	25	**8.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	25	**8.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							

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*	
Matrix Spikes (MS) - Continued							
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	2	8	**25.0**	**5.0**	✓	ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	25	**8.0**	**5.0**	✓	ALS QCS3 requirement
Pesticides by GCMS	EP068	2	16	**12.5**	**5.0**	✓	ALS QCS3 requirement
TKN as N By Discrete Analyser	EK061G	1	5	**20.0**	**4.8**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	34	**5.9**	**5.0**	✓	ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	39	**5.1**	**5.0**	✓	ALS QCS3 requirement
Total Phosporus By Discrete Analyser	EK067G	1	13	**7.7**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	25	**8.0**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	25	**8.0**	**5.0**	✓	ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (1999) Schedule B(3) (Method 102)
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) 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 (1999) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 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 (1999) Schedule B(3)
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	SOIL	APHA 21st ed., 4500 NO3- F. Combined oxidised Nitrogen (NO2+NO3) in a water extract is determined by Cadmium Reduction, and direct colourimetry by Discrete Analyser.
TKN as N By Discrete Analyser	EK061G	SOIL	APHA 21st ed., 4500-Norg-D Soil samples are digested using Kjeldahl digestion followed by determination by Discrete Analyser.
Total Nitrogen as N (TKN + NOx) By Discrete Analyser	EK062G	SOIL	APHA 21st ed., 4500 Norg/NO3- Total Nitrogen is determined as the sum of TKN and Oxidised Nitrrogen, each determined seperately as N.
Total Phosporus By Discrete Analyser	EK067G	SOIL	APHA 21st ed., 4500 P-B&F This procedure involves sulfuric acid digestion and quantification using Discrete Analyser.
Pesticides by GCMS	EP068	SOIL	(USEPA SW 846 - 8270B) 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 (1999) Schedule B(3) (Method 504,505)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	SOIL	APHA 21st ed., 4500 Norg- D; APHA 21st ed., 4500 P - H. Macro Kjeldahl digestion.
Sample Compositing	* EN020	SOIL	Equal weights of each original soil are taken, then mixed and homogenised. The combined mixture is labelled as a new sample.
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of distilled water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. 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 (1999) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option A - Concentrating)	ORG17A	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EG005T: Total Metals by ICP-AES	ES0912886-028	TP196.70 1.5M	**Chromium**	7440-47-3	61.7 %	0-20%	**RPD exceeds LOR based limits**
EG005T: Total Metals by ICP-AES	ES0912619-001	Anonymous	**Zinc**	7440-66-6	31.3 %	0-20%	**RPD exceeds LOR based limits**
Laboratory Control Spike (LCS) Recoveries							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1247199-007	----	**Naphthalene**	91-20-3	113 %	81.9-113%	**Recovery greater than upper control limit**
Matrix Spike (MS) Recoveries							
EK059G: NOX as N by Discrete Analyser	ES0912858-002	Anonymous	**Nitrite + Nitrate as N (Sol.)**	----	63.5 %	70-130%	**Recovery less than lower data quality objective**
EP068A: Organochlorine Pesticides (OC)	ES0912886-017	TP203.68 0.5M	**Aldrin**	309-00-2	19.7 %	77.54-107.0 %	**Recovery less than lower data quality objective**
EP068A: Organochlorine Pesticides (OC)	ES0912895-001	Anonymous	**4.4`-DDT**	50-29-3	66.9 %	67.12-118.10 %	**Recovery less than lower data quality objective**

- **For all matrices, no Method Blank value outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

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

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

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

QUALITY CONTROL REPORT

Work Order	: **ES0912886**	Page	: 1 of 15
Client	: **GHD SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR JESSE SIMKUS	Contact	: Charlie Pierce
Address	: PO BOX 5403 NEWCASTLE WEST NSW, AUSTRALIA 2302	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jesse.simkus@ghd.com.au	E-mail	: charlie.pierce@alsenviro.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 221454521	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 27-AUG-2009
Sampler	: JS	Issue Date	: 01-SEP-2009
Order number	: ----		
		No. of samples received	: 82
Quote number	: EN/005/09	No. of samples analysed	: 30

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

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

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Spectroscopist	Inorganics
Hoa Nguyen	Inorganic Chemist	Inorganics
Pabi Subba	Senior Organic Chemist (Semi-Volatile)	Organics
Victor Kedicioglu	Business Manager - NSW	Inorganics

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 insuffient sample for analysis.

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

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

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 (QC Lot: 1084264)									
ES0912858-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	22.6	22.6	0.0	0% - 20%
ES0912886-006	TP223.30 0.0M	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	6.6	6.7	2.4	No Limit
EA055: Moisture Content (QC Lot: 1084265)									
ES0912886-017	TP203.68 0.5M	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	24.1	23.4	3.0	0% - 20%
ES0912886-026	TP196.90 1.5M	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	14.9	15.6	4.6	0% - 50%
EA055: Moisture Content (QC Lot: 1084605)									
ES0912886-031	TPQA09	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	10.0	12.9	25.5	0% - 50%
ES0912966-005	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	22.4	22.8	1.6	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 1084773)									
ES0912619-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	8	7	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	10	10	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	6	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	25	26	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	11	11	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	84	115	# 31.3	0% - 20%
ES0912886-006	TP223.30 0.0M	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	5	8	33.8	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	2	3	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	7	6	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	6	6	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	10	10	0.0	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 1084775)									
ES0912886-018	TP197.58 0.0M	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	189	214	12.2	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	7	11	39.9	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	8	9	14.1	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	16	25	43.2	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	31	45	36.4	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	41	51	22.6	0% - 50%
ES0912886-028	TP196.70 1.5M	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	26	49	# 61.7	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	12	12	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	10	49.4	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 (%)*
EG005T: Total Metals by ICP-AES (QC Lot: 1084775) - continued									
ES0912886-028	TP196.70 1.5M	EG005T: Copper	7440-50-8	5	mg/kg	12	25	68.2	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	12	25	67.6	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	20	23	15.9	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1084774)									
ES0912619-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES0912886-006	TP223.30 0.0M	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1084776)									
ES0912886-018	TP197.58 0.0M	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES0912886-028	TP196.70 1.5M	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EK059G: NOX as N by Discrete Analyser (QC Lot: 1084084)									
ES0912858-002	Anonymous	EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	4.0	4.7	15.0	0% - 20%
EK059G: NOX as N by Discrete Analyser (QC Lot: 1084567)									
ES0912886-015	TP208.D7 0.0M	EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	0.1	0.2	71.4	No Limit
EK061G: Total Kjeldahl Nitrogen as N (QC Lot: 1085087)									
ES0912886-012	TP208.37 0.3M	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	20	20	0.0	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 1085086)									
ES0912886-012	TP208.37 0.3M	EK067G: Total Phosphorus as P	----	2	mg/kg	11	11	0.0	No Limit
ES0912945-001	Anonymous	EK067G: Total Phosphorus as P	----	2	mg/kg	2300	2400	4.4	0% - 20%
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1084145)									
ES0912895-001	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1084145) - continued									
ES0912895-001	Anonymous	EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
ES0912886-026	TP196.90 1.5M	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1084493)									
ES0912886-017	TP203.68 0.5M	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1084493) - continued									
ES0912886-017	TP203.68 0.5M	EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1084091)									
ES0912886-012	TP208.37 0.3M	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES0912886-021	TP197.40 0.0M	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1084496)									

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: 1084496) - continued									
ES0912966-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1084049)									
ES0912886-012	TP208.37 0.3M	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES0912886-021	TP197.40 0.0M	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1084090)									
ES0912886-012	TP208.37 0.3M	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES0912886-021	TP197.40 0.0M	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1084492)									
ES0912966-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1084495)									
ES0912966-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEX (QC Lot: 1084049)									
ES0912886-012	TP208.37 0.3M	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEX (QC Lot: 1084049) - continued									
ES0912886-021	TP197.40 0.0M	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080: BTEX (QC Lot: 1084492)									
ES0912966-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method 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: 1084773)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.1 mg/kg	115	90.1	124
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.76 mg/kg	107	83.3	111
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.9 mg/kg	111	89.2	117
EG005T: Copper	7440-50-8	5	mg/kg	<5	54.7 mg/kg	112	90.1	114
EG005T: Lead	7439-92-1	5	mg/kg	<5	55.2 mg/kg	106	85.2	111
EG005T: Nickel	7440-02-0	2	mg/kg	<2	54.8 mg/kg	111	88.3	116
EG005T: Zinc	7440-66-6	5	mg/kg	<5	104 mg/kg	109	88.9	112
EG005T: Total Metals by ICP-AES (QCLot: 1084775)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.1 mg/kg	116	90.1	124
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.76 mg/kg	106	83.3	111
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.9 mg/kg	111	89.2	117
EG005T: Copper	7440-50-8	5	mg/kg	<5	54.7 mg/kg	112	90.1	114
EG005T: Lead	7439-92-1	5	mg/kg	<5	55.2 mg/kg	105	85.2	111
EG005T: Nickel	7440-02-0	2	mg/kg	<2	54.8 mg/kg	112	88.3	116
EG005T: Zinc	7440-66-6	5	mg/kg	<5	104 mg/kg	107	88.9	112
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1084774)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.4 mg/kg	80.5	67	118
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1084776)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.4 mg/kg	85.5	67	118
EK059G: NOX as N by Discrete Analyser (QCLot: 1084084)								
EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	4.8 mg/kg	95.8	70	130
EK059G: NOX as N by Discrete Analyser (QCLot: 1084567)								
EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	4.8 mg/kg	105	70	130
EK061G: Total Kjeldahl Nitrogen as N (QCLot: 1085087)								
EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20	1000 mg/kg	113	70	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 1085086)								
EK067G: Total Phosphorus as P	----	2	mg/kg	<2	442 mg/kg	118	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 1084145)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.25 mg/kg	96.5	60.8	116
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.25 mg/kg	98.3	59.4	115
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.25 mg/kg	101	59.8	117
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.25 mg/kg	99.8	59.8	118
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.25 mg/kg	102	65.8	114

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
EP068A: Organochlorine Pesticides (OC) (QCLot: 1084145) - continued								
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.25 mg/kg	94.4	65.6	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.25 mg/kg	93.9	67	113
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.25 mg/kg	104	65.6	113
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.25 mg/kg	105	60.7	113
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.25 mg/kg	106	65.8	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.25 mg/kg	104	57.3	120
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.25 mg/kg	106	67.4	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.25 mg/kg	105	67.5	114
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.25 mg/kg	86.4	63	121
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.25 mg/kg	108	66.1	117
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.25 mg/kg	110	65.3	116
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.25 mg/kg	107	57.3	115
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.25 mg/kg	100	63.6	119
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.25 mg/kg	97.5	58.4	127
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.25 mg/kg	101	63.6	117
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.25 mg/kg	102	50.4	132
EP068A: Organochlorine Pesticides (OC) (QCLot: 1084493)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.25 mg/kg	91.9	60.8	116
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.25 mg/kg	92.6	59.4	115
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.25 mg/kg	95.6	59.8	117
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.25 mg/kg	94.3	59.8	118
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.25 mg/kg	95.7	65.8	114
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.25 mg/kg	93.6	65.6	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.25 mg/kg	92.6	67	113
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.25 mg/kg	98.8	65.6	113
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.25 mg/kg	100	60.7	113
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.25 mg/kg	100	65.8	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.25 mg/kg	99.4	57.3	120
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.25 mg/kg	101	67.4	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.25 mg/kg	99.3	67.5	114
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.25 mg/kg	120	63	121
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.25 mg/kg	101	66.1	117
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.25 mg/kg	100	65.3	116
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.25 mg/kg	92.9	57.3	115
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.25 mg/kg	92.4	63.6	119
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.25 mg/kg	95.4	58.4	127
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.25 mg/kg	91.0	63.6	117
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.25 mg/kg	105	50.4	132
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1084091)								

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: 1084091) - continued								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	# 113	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	110	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	110	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	110	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	112	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	112	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	111	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	112	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	111	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	114	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	107	71.8	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	108	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	107	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	99.5	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	98.7	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	96.5	72.4	114
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1084496)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	94.4	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	88.8	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	86.7	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	86.3	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	87.5	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	89.3	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	90.0	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	89.6	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	93.6	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	100	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	87.9	71.8	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	92.5	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	88.2	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	85.0	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	82.5	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	87.4	72.4	114
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1084049)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	82.0	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1084090)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	103	75.2	116
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	200 mg/kg	92.0	75.3	113
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	87.0	72.6	117

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
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1084492)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	110	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1084495)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	102	75.2	116
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	200 mg/kg	103	75.3	113
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	103	72.6	117
EP080: BTEX (QCLot: 1084049)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	80.0	67.5	125
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	102	69	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	80.4	65.3	126
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	86.4	66.5	124
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	87.5	66.7	123
EP080: BTEX (QCLot: 1084492)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	105	67.5	125
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	105	69	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	113	65.3	126
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	119	66.5	124
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	116	66.7	123

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 1084773)							
ES0912619-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	107	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	106	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	108	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	119	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	106	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	107	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	111	70	130
EG005T: Total Metals by ICP-AES (QCLot: 1084775)							
ES0912886-018	TP197.58 0.0M	EG005T: Arsenic	7440-38-2	50 mg/kg	100	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	90.2	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	97.8	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	112	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	89.5	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	94.4	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	90.4	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1084774)							
ES0912619-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	90.2	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1084776)							
ES0912886-018	TP197.58 0.0M	EG035T: Mercury	7439-97-6	5 mg/kg	103	70	130
EK059G: NOX as N by Discrete Analyser (QCLot: 1084084)							
ES0912858-002	Anonymous	EK059G: Nitrite + Nitrate as N (Sol.)	----	3.0 mg/kg	# 63.5	70	130
EK059G: NOX as N by Discrete Analyser (QCLot: 1084567)							
ES0912886-016	TP207.97 0.0M	EK059G: Nitrite + Nitrate as N (Sol.)	----	3.0 mg/kg	101	70	130
EK061G: Total Kjeldahl Nitrogen as N (QCLot: 1085087)							
ES0912886-012	TP208.37 0.3M	EK061G: Total Kjeldahl Nitrogen as N	----	500 mg/kg	118	70	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 1085086)							
ES0912886-012	TP208.37 0.3M	EK067G: Total Phosphorus as P	----	100 mg/kg	122	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 1084145)							
ES0912895-001	Anonymous	EP068: gamma-BHC	58-89-9	0.25 mg/kg	88.8	75.65	110.44
		EP068: Heptachlor	76-44-8	0.25 mg/kg	77.3	72.2	106.71
		EP068: Aldrin	309-00-2	0.25 mg/kg	85.9	77.54	107.0
		EP068: Dieldrin	60-57-1	0.25 mg/kg	85.3	76.37	109.7
		EP068: Endrin	72-20-8	1 mg/kg	108	68.51	119.47

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 1084145) - continued							
ES0912895-001	Anonymous	EP068: 4.4`-DDT	50-29-3	1 mg/kg	# 66.9	67.12	118.10
EP068A: Organochlorine Pesticides (OC) (QCLot: 1084493)							
ES0912886-017	TP203.68 0.5M	EP068: gamma-BHC	58-89-9	0.25 mg/kg	96.1	75.65	110.44
		EP068: Heptachlor	76-44-8	0.25 mg/kg	98.0	72.2	106.71
		EP068: Aldrin	309-00-2	0.25 mg/kg	# 19.7	77.54	107.0
		EP068: Dieldrin	60-57-1	0.25 mg/kg	92.4	76.37	109.7
		EP068: Endrin	72-20-8	1 mg/kg	112	68.51	119.47
		EP068: 4.4`-DDT	50-29-3	1 mg/kg	83.5	67.12	118.10
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1084091)							
ES0912886-012	TP208.37 0.3M	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	108	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	112	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1084496)							
ES0912966-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	75.5	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	77.3	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1084049)							
ES0912886-012	TP208.37 0.3M	EP080: C6 - C9 Fraction	----	26 mg/kg	88.8	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1084090)							
ES0912886-012	TP208.37 0.3M	EP071: C10 - C14 Fraction	----	640 mg/kg	90.3	70	130
		EP071: C15 - C28 Fraction	----	3140 mg/kg	83.5	70	130
		EP071: C29 - C36 Fraction	----	2860 mg/kg	77.7	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1084492)							
ES0912966-001	Anonymous	EP080: C6 - C9 Fraction	----	26 mg/kg	100	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1084495)							
ES0912966-001	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	89.4	70	130
		EP071: C15 - C28 Fraction	----	3140 mg/kg	86.6	70	130
		EP071: C29 - C36 Fraction	----	2860 mg/kg	79.0	70	130
EP080: BTEX (QCLot: 1084049)							
ES0912886-012	TP208.37 0.3M	EP080: Benzene	71-43-2	2.5 mg/kg	73.3	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	85.4	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	79.5	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	81.4	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	84.7	70	130
EP080: BTEX (QCLot: 1084492)							
ES0912966-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	76.8	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	88.1	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	93.4	70	130

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: Spike Recovery (%) MS	Matrix Spike (MS) Report: Recovery Limits (%) Low	Matrix Spike (MS) Report: Recovery Limits (%) High
EP080: BTEX (QCLot: 1084492) - continued							
ES0912966-001	Anonymous	EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	95.5	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	97.8	70	130

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES0912886**	Page	: 1 of 19
Client	: **GHD SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR JESSE SIMKUS	Contact	: Charlie Pierce
Address	: PO BOX 5403 NEWCASTLE WEST NSW, AUSTRALIA 2302	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jesse.simkus@ghd.com.au	E-mail	: charlie.pierce@alsenviro.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 221454521	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 27-AUG-2009
Sampler	: JS	Issue Date	: 01-SEP-2009
Site	: ----		
		No. of samples received	: 82
Quote number	: EN/005/09	No. of samples analysed	: 30

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Spectroscopist	Inorganics
Hoa Nguyen	Inorganic Chemist	Inorganics
Pabi Subba	Senior Organic Chemist (Semi-Volatile)	Organics
Victor Kedicioglu	Business Manager - NSW	Inorganics

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 insuffient 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 date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

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

- **EG005T: Poor precision was obtained for Chromium on sample ES0912886#28 due to sample heterogeneity. Results have been confirmed by re-extraction and reanalysis.**
- **EG005T: Poor precision was obtained for Zinc on sample ES0912619#1 due to sample heterogeneity.**
- **EK059G: Spike failed for Nox due to matrix interference.(confirmed by re-analysis).**
- **EP068 : Poor matrix spike recovery for Aldrin due to sample heterogeneity. Confirmed by re-extraction and re-analysis.**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: COMPOSITE 1	COMPOSITE 2	TP223.50 0.0M	TP223.40B 0.3M	TP223.40A 0.0M
				Client sampling date / time: 27-AUG-2009 15:00	27-AUG-2009 15:00	27-AUG-2009 15:00	27-AUG-2009 15:00	27-AUG-2009 15:00
				ES0912886-001	ES0912886-002	ES0912886-003	ES0912886-004	ES0912886-005
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	**10.2**	**19.0**	**15.4**	**10.5**	**11.7**
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	----	<5	**9**	<5
Cadmium	7440-43-9	1	mg/kg	----	----	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	----	----	**8**	**8**	**8**
Copper	7440-50-8	5	mg/kg	----	----	**52**	**7**	**25**
Lead	7439-92-1	5	mg/kg	----	----	**11**	**6**	**11**
Nickel	7440-02-0	2	mg/kg	----	----	**5**	**8**	**6**
Zinc	7440-66-6	5	mg/kg	----	----	**50**	**18**	**50**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	----	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	----	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	**115**	**107**	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	**114**	**103**	----	----	----

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: TP223.30 0.0M Client sampling date / time: 27-AUG-2009 15:00 ES0912886-006	TP223.20 0.0M 27-AUG-2009 15:00 ES0912886-007	TP223.10 0.3M 27-AUG-2009 15:00 ES0912886-008	TP223.00 0.0M 27-AUG-2009 15:00 ES0912886-009	TP208.37 0.3M 27-AUG-2009 15:00 ES0912886-012
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	6.6	14.6	16.8	31.4	13.9
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	5	7	8	10	6
Copper	7440-50-8	5	mg/kg	7	17	6	23	<5
Lead	7439-92-1	5	mg/kg	6	12	7	19	<5
Nickel	7440-02-0	2	mg/kg	2	6	8	4	<2
Zinc	7440-66-6	5	mg/kg	10	36	15	20	<5
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK059G: NOX as N by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	----	----	----	----	<0.1
EK061G: Total Kjeldahl Nitrogen as N								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	----	----	----	----	20
EK062: Total Nitrogen as N								
^ Total Nitrogen as N	----	20	mg/kg	----	----	----	----	20
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	2	mg/kg	----	----	----	----	11
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)fluoranthene	205-99-2	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
EP080/071: Total Petroleum Hydrocarbons								

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: TP223.30 0.0M	TP223.20 0.0M	TP223.10 0.3M	TP223.00 0.0M	TP208.37 0.3M
				Client sampling date / time: 27-AUG-2009 15:00	27-AUG-2009 15:00	27-AUG-2009 15:00	27-AUG-2009 15:00	27-AUG-2009 15:00
				ES0912886-006	ES0912886-007	ES0912886-008	ES0912886-009	ES0912886-012
EP080/071: Total Petroleum Hydrocarbons - Continued								
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
EP080: BTEX								
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
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	----	----	----	----	**95.5**
2-Chlorophenol-D4	93951-73-6	0.1	%	----	----	----	----	**93.5**
2.4.6-Tribromophenol	118-79-6	0.1	%	----	----	----	----	**75.8**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	----	----	----	----	**93.1**
Anthracene-d10	1719-06-8	0.1	%	----	----	----	----	**94.8**
4-Terphenyl-d14	1718-51-0	0.1	%	----	----	----	----	**89.8**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	----	----	----	----	**91.4**
Toluene-D8	2037-26-5	0.1	%	----	----	----	----	**107**
4-Bromofluorobenzene	460-00-4	0.1	%	----	----	----	----	**96.1**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: TP208.27 0.0M Client sampling date / time: 27-AUG-2009 15:00 ES0912886-013	TP208.17 0.0M 27-AUG-2009 15:00 ES0912886-014	TP208.D7 0.0M 27-AUG-2009 15:00 ES0912886-015	TP207.97 0.0M 27-AUG-2009 15:00 ES0912886-016	TP203.68 0.5M 27-AUG-2009 15:00 ES0912886-017
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	17.0	8.6	14.0	8.0	24.1
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	6	8	<5	<5	10
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	17	17	9	10	33
Copper	7440-50-8	5	mg/kg	31	149	6	8	23
Lead	7439-92-1	5	mg/kg	33	34	10	16	16
Nickel	7440-02-0	2	mg/kg	12	16	3	3	29
Zinc	7440-66-6	5	mg/kg	64	67	18	18	50
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK059G: NOX as N by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	0.3	0.1	0.1	----
EK061G: Total Kjeldahl Nitrogen as N								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	600	400	290	410	----
EK062: Total Nitrogen as N								
^ Total Nitrogen as N	----	20	mg/kg	600	400	290	410	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	2	mg/kg	140	72	35	44	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	----	----	----	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	----	----	----	<0.05
beta-BHC	319-85-7	0.05	mg/kg	----	----	----	----	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	----	----	----	----	<0.05
delta-BHC	319-86-8	0.05	mg/kg	----	----	----	----	<0.05
Heptachlor	76-44-8	0.05	mg/kg	----	----	----	----	<0.05
Aldrin	309-00-2	0.05	mg/kg	----	----	----	----	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	----	----	----	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	----	----	----	----	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	----	----	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	----	----	----	----	<0.05
Dieldrin	60-57-1	0.05	mg/kg	----	----	----	----	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	----	----	----	----	<0.05
Endrin	72-20-8	0.05	mg/kg	----	----	----	----	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	----	----	----	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	----	----	----	----	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	----	----	----	<0.05

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: TP208.27 0.0M Client sampling date / time: 27-AUG-2009 15:00 ES0912886-013	TP208.17 0.0M 27-AUG-2009 15:00 ES0912886-014	TP208.D7 0.0M 27-AUG-2009 15:00 ES0912886-015	TP207.97 0.0M 27-AUG-2009 15:00 ES0912886-016	TP203.68 0.5M 27-AUG-2009 15:00 ES0912886-017
EP068A: Organochlorine Pesticides (OC) - Continued								
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	----	----	----	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	----	----	----	----	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	----	----	----	----	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	----	----	----	----	<0.2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	**0.8**	<0.5	<0.5	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	**1.7**	<0.5	<0.5	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	**1.6**	<0.5	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	**0.5**	<0.5	<0.5	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	**0.5**	<0.5	<0.5	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	**0.7**	<0.5	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	**0.6**	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	----	----	----	----	**107**
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	----	----	----	----	**94.6**
EP075(SIM)S: Phenolic Compound Surrogates								

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: TP208.27 0.0M	TP208.17 0.0M	TP208.D7 0.0M	TP207.97 0.0M	TP203.68 0.5M
				Client sampling date / time: 27-AUG-2009 15:00	27-AUG-2009 15:00	27-AUG-2009 15:00	27-AUG-2009 15:00	27-AUG-2009 15:00
				ES0912886-013	ES0912886-014	ES0912886-015	ES0912886-016	ES0912886-017
EP075(SIM)S: Phenolic Compound Surrogates - Continued								
Phenol-d6	13127-88-3	0.1	%	**94.3**	**97.0**	**106**	**101**	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**93.3**	**95.3**	**91.6**	**98.4**	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**75.5**	**91.6**	**96.9**	**100**	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**90.3**	**93.4**	**95.3**	**95.5**	----
Anthracene-d10	1719-06-8	0.1	%	**92.8**	**95.0**	**109**	**97.5**	----
4-Terphenyl-d14	1718-51-0	0.1	%	**88.4**	**90.4**	**123**	**92.6**	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**89.9**	**88.2**	**99.3**	**93.9**	----
Toluene-D8	2037-26-5	0.1	%	**103**	**107**	**99.1**	**106**	----
4-Bromofluorobenzene	460-00-4	0.1	%	**98.4**	**91.5**	**111**	**98.6**	----

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: TP197.58 0.0M	TP197.55 0.0M	TP197.54 0.0M	TP197.40 0.0M	TP197.30 0.5M
				Client sampling date / time: 27-AUG-2009 15:00	27-AUG-2009 15:00	27-AUG-2009 15:00	27-AUG-2009 15:00	27-AUG-2009 15:00
				ES0912886-018	ES0912886-019	ES0912886-020	ES0912886-021	ES0912886-022
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	8.1	6.6	7.7	13.3	24.4
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	8	9	19	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	189	32	72	37	71
Copper	7440-50-8	5	mg/kg	16	15	51	10	12
Lead	7439-92-1	5	mg/kg	31	21	28	18	26
Nickel	7440-02-0	2	mg/kg	7	8	8	15	16
Zinc	7440-66-6	5	mg/kg	41	52	52	20	16
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	----	----	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	----	----	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	----	----	----	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	----	----	----	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	----	----	----	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	----	----	----	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	----	----	----	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	----	----	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	----	----	----	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	----	----	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	----	----	----	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	----	----	----	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	----	----	----	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	----	----	----	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	----	----	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	----	----	----	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	----	----	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	----	----	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	----	----	----	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	----	----	----	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	----	----	----	<0.2	<0.2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: TP197.58 0.0M Client sampling date / time: 27-AUG-2009 15:00 ES0912886-018	TP197.55 0.0M 27-AUG-2009 15:00 ES0912886-019	TP197.54 0.0M 27-AUG-2009 15:00 ES0912886-020	TP197.40 0.0M 27-AUG-2009 15:00 ES0912886-021	TP197.30 0.5M 27-AUG-2009 15:00 ES0912886-022
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	**140**	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	----	----	----	**96.2**	**103**
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	----	----	----	**96.1**	**99.9**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**91.4**	**94.6**	**93.2**	**92.6**	**88.1**
2-Chlorophenol-D4	93951-73-6	0.1	%	**89.5**	**91.6**	**89.7**	**90.4**	**86.3**
2.4.6-Tribromophenol	118-79-6	0.1	%	**69.9**	**74.2**	**64.1**	**70.2**	**58.5**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**90.2**	**89.7**	**90.5**	**90.8**	**89.7**
Anthracene-d10	1719-06-8	0.1	%	**88.2**	**91.3**	**91.8**	**92.8**	**90.9**
4-Terphenyl-d14	1718-51-0	0.1	%	**85.4**	**86.0**	**87.2**	**88.1**	**86.6**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**95.1**	**84.7**	**96.0**	**91.9**	**92.1**

Analytical Results

Sub-Matrix: SOIL				Client sample ID	TP197.58 0.0M	TP197.55 0.0M	TP197.54 0.0M	TP197.40 0.0M	TP197.30 0.5M
				Client sampling date / time	27-AUG-2009 15:00	27-AUG-2009 15:00	27-AUG-2009 15:00	27-AUG-2009 15:00	27-AUG-2009 15:00
Compound	CAS Number	LOR	Unit		ES0912886-018	ES0912886-019	ES0912886-020	ES0912886-021	ES0912886-022
EP080S: TPH(V)/BTEX Surrogates - Continued									
Toluene-D8	2037-26-5	0.1	%		**111**	**106**	**113**	**108**	**106**
4-Bromofluorobenzene	460-00-4	0.1	%		**91.7**	**88.9**	**90.4**	**93.8**	**90.2**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: TP197.20 1.0M Client sampling date / time: 27-AUG-2009 15:00 ES0912886-023	TP197.10 0.0M 27-AUG-2009 15:00 ES0912886-024	TP197.00 0.5M 27-AUG-2009 15:00 ES0912886-025	TP196.90 1.5M 27-AUG-2009 15:00 ES0912886-026	TP196.80 0.0M 27-AUG-2009 15:00 ES0912886-027
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	**11.7**	**10.4**	**12.7**	**14.9**	**9.6**
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	**7**	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**22**	**20**	**20**	**26**	**19**
Copper	7440-50-8	5	mg/kg	**8**	**7**	**12**	**13**	**13**
Lead	7439-92-1	5	mg/kg	**13**	**18**	**6**	**12**	**17**
Nickel	7440-02-0	2	mg/kg	**28**	**8**	**14**	**16**	**7**
Zinc	7440-66-6	5	mg/kg	**31**	**37**	**17**	**29**	**20**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: TP197.20 1.0M Client sampling date / time: 27-AUG-2009 15:00 ES0912886-023	TP197.10 0.0M 27-AUG-2009 15:00 ES0912886-024	TP197.00 0.5M 27-AUG-2009 15:00 ES0912886-025	TP196.90 1.5M 27-AUG-2009 15:00 ES0912886-026	TP196.80 0.0M 27-AUG-2009 15:00 ES0912886-027
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	**0.5**	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	**120**
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	**110**	**106**	**96.3**	**106**	**98.5**
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	**110**	**107**	**95.5**	**106**	**98.8**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**90.5**	**97.0**	**96.3**	**92.4**	**94.8**
2-Chlorophenol-D4	93951-73-6	0.1	%	**85.4**	**94.8**	**92.5**	**91.5**	**93.2**
2.4.6-Tribromophenol	118-79-6	0.1	%	**66.2**	**80.1**	**74.8**	**73.4**	**79.7**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**92.1**	**93.7**	**90.6**	**91.3**	**92.9**
Anthracene-d10	1719-06-8	0.1	%	**86.8**	**94.3**	**93.5**	**94.5**	**92.4**
4-Terphenyl-d14	1718-51-0	0.1	%	**85.1**	**90.5**	**88.1**	**88.3**	**88.6**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**97.1**	**93.3**	**92.2**	**90.6**	**90.5**

Analytical Results

Sub-Matrix: SOIL				Client sample ID	TP197.20 1.0M	TP197.10 0.0M	TP197.00 0.5M	TP196.90 1.5M	TP196.80 0.0M
				Client sampling date / time	27-AUG-2009 15:00	27-AUG-2009 15:00	27-AUG-2009 15:00	27-AUG-2009 15:00	27-AUG-2009 15:00
Compound	CAS Number	LOR	Unit		ES0912886-023	ES0912886-024	ES0912886-025	ES0912886-026	ES0912886-027
EP080S: TPH(V)/BTEX Surrogates - Continued									
Toluene-D8	2037-26-5	0.1	%		**112**	**112**	**107**	**84.6**	**108**
4-Bromofluorobenzene	460-00-4	0.1	%		**92.6**	**92.7**	**91.1**	**95.6**	**91.7**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID	TP196.70 1.5M	TP196.60 0.5M	TPQA07	TPQA09	TPQA11
				Client sampling date / time	27-AUG-2009 15:00	27-AUG-2009 15:00	27-AUG-2009 15:00	27-AUG-2009 15:00	27-AUG-2009 15:00
					ES0912886-028	ES0912886-029	ES0912886-030	ES0912886-031	ES0912886-032
EA055: Moisture Content									
^ Moisture Content (dried @ 103°C)	----	1.0	%		**24.3**	**15.0**	**7.2**	**10.0**	**20.9**
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		**6**	**7**	<5	**6**	<5
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		**26**	**15**	**15**	**83**	**25**
Copper	7440-50-8	5	mg/kg		**12**	**6**	**10**	**8**	**12**
Lead	7439-92-1	5	mg/kg		**12**	**14**	**13**	**18**	**11**
Nickel	7440-02-0	2	mg/kg		**12**	**7**	**5**	**10**	**11**
Zinc	7440-66-6	5	mg/kg		**20**	**32**	**38**	**10**	**28**
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<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
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
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
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	----	----	<0.2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: TP196.70 1.5M Client sampling date / time: 27-AUG-2009 15:00 ES0912886-028	Client sample ID: TP196.60 0.5M Client sampling date / time: 27-AUG-2009 15:00 ES0912886-029	Client sample ID: TPQA07 Client sampling date / time: 27-AUG-2009 15:00 ES0912886-030	Client sample ID: TPQA09 Client sampling date / time: 27-AUG-2009 15:00 ES0912886-031	Client sample ID: TPQA11 Client sampling date / time: 27-AUG-2009 15:00 ES0912886-032
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	**120**	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	**96.9**	**117**	----	----	**96.7**
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	**94.2**	**114**	----	----	**94.3**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**91.4**	**98.9**	**95.7**	**104**	**104**
2-Chlorophenol-D4	93951-73-6	0.1	%	**91.2**	**96.4**	**94.9**	**85.0**	**91.5**
2.4.6-Tribromophenol	118-79-6	0.1	%	**84.4**	**84.8**	**77.8**	**101**	**118**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**87.6**	**94.5**	**94.9**	**89.7**	**109**
Anthracene-d10	1719-06-8	0.1	%	**89.5**	**96.4**	**96.7**	**104**	**104**
4-Terphenyl-d14	1718-51-0	0.1	%	**86.8**	**92.4**	**92.2**	**105**	**107**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**88.5**	**97.5**	**97.5**	**104**	**96.9**

Analytical Results

Sub-Matrix: SOIL				Client sample ID	TP196.70 1.5M	TP196.60 0.5M	TPQA07	TPQA09	TPQA11
				Client sampling date / time	27-AUG-2009 15:00	27-AUG-2009 15:00	27-AUG-2009 15:00	27-AUG-2009 15:00	27-AUG-2009 15:00
Compound	CAS Number	LOR	Unit		ES0912886-028	ES0912886-029	ES0912886-030	ES0912886-031	ES0912886-032
EP080S: TPH(V)/BTEX Surrogates - Continued									
Toluene-D8	2037-26-5	0.1	%		**101**	**116**	**109**	**99.8**	**95.1**
4-Bromofluorobenzene	460-00-4	0.1	%		**86.6**	**93.7**	**86.7**	**109**	**104**

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	10	136
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	10	136
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	24	113
2-Chlorophenol-D4	93951-73-6	23	134
2.4.6-Tribromophenol	118-79-6	19	122
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	30	115
Anthracene-d10	1719-06-8	27	133
4-Terphenyl-d14	1718-51-0	18	137
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney:** 277 Woodpark Rd, Smithfield NSW 2164 Ph 02 8784 8555 E: samples.sydney@alsenviro.com

☑ **Newcastle:** 5 Rosegum Rd, Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com

☐ **Brisbane:** 32 Shand St, Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com

☐ **Townsville:** 14-15 Desma Ct, Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com

☐ **Melbourne:** 2-4 Westall Rd, Springvale, VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsenviro.com

☐ **Adelaide:** 2/1 Burma Rd, Pooraka SA 5095 Ph:08 8359 0890 E: adelaide@alsenviro.com

☐ **Perth:** 10 Hod Way, Malaga, WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com

☐ **Launceston:** 27 Wellington St, Launceston, TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

2/9/09 as per Markhurst

CLIENT: GHD	**TURNAROUND REQUIREMENTS:** (Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☑ Standard TAT (List due date): 31/8/09 ☐ Non Standard or urgent TAT (List due date):
OFFICE: NEWCASTLE	
PROJECT: 22145452 1	**ALS QUOTE NO.:**
PURCHASE ORDER NUMBER:	COC SEQUENCE NUMBER (Circle) COC: (1) 2 3 4 5 6 7 OF: 1 2 3 4 5 6 (7)
PROJECT MANAGER: Alison Markley	**CONTACT PH:** 49799990
SAMPLER: Jesse Simkus	**SAMPLER MOBILE:** 0404542354
COC emailed to ALS? (YES / NO)	**EDD FORMAT (or default):** I
Email Reports to (will default to PM if no other addresses are listed):	Jesse Simkus
Email Invoice to (will default to PM if no other addresses are listed):	Melissa Simpson

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: 1.8 °C
Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Rhys Holmwood	PETER DONAGHY		JENIE
DATE/TIME: 27/8/09 4 pm	DATE/TIME: 27/8/09 1600	DATE/TIME:	DATE/TIME: 28-8-09 8:20 am

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	TPH BTEX	PAHs	Metals 5-2	OCPs	PCBs	COMPOSITE ①	Composite ②		Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
(3)	TP223.50 0.0M	27/8/09	S	250mL JAR	1			X			X			
(3)	TP223.50 0.3M													
(34)	TP223.40B 0.0M													
(A)	TP223.40B 0.3M							X						
(5)	TP223.40A 0.0M			Subcon / Forward Lab / Split WO				X			X			
(35)	TP223.40A 0.3M			Lab / Analysis: LABMARK										
(6)	TP223.30 0.0M			Organised By / Date:				X			X			
(36)	TP223.30 0.3M			Relinquished By / Date:				X						
(7)	TP223.20 0.0M			Connote / Courier:				X				X		
(37)	TP223.20 0.3M			WO No: ES0912886										
(38)	TP223.10 0.0M			Attach By PO / Internal SF										
(8)	TP223.10 0.3M							X			X	X		
				TOTAL										

Environmental Division
Sydney
Work Order
ES0912886

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.

153813

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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☐ **Townsville:** 14-15 Desma Ct, Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com

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☐ **Adelaide:** 2/1 Burma Rd, Pooraka SA 5095 Ph:08 8359 0890 E: adelaide@alsenviro.com

☐ **Perth:** 10 Hod Way, Malaga, WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com

☐ **Launceston:** 27 Wellington St, Launceston, TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT:	**TURNAROUND REQUIREMENTS:** (Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):	**FOR LABORATORY USE ONLY (Circle)** Custody Seal Intact? Yes No N/A
OFFICE:		Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT:	**ALS QUOTE NO.:**	COC SEQUENCE NUMBER (Circle) COC: 1 (2) 3 4 5 6 7
PURCHASE ORDER NUMBER:		OF: 1 2 3 4 5 6 (7)
PROJECT MANAGER:	**CONTACT PH:**	Random Sample Temperature on Receipt: 7.8 °C
SAMPLER:	**SAMPLER MOBILE:** 0404542354	Other comment:
COC emailed to ALS? (YES / NO)	**EDD FORMAT** (or default):	
Email Reports to (will default to PM if no other addresses are listed):		
Email Invoice to (will default to PM if no other addresses are listed):		

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Rhys Holmewood	PETER DONAGHY		JESSIE
DATE/TIME: 27/8/09 4pm	DATE/TIME: 27/8/09 1600	DATE/TIME:	DATE/TIME: 28-8-09 - 8:30 a.m.

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	TPH BTEX	PAHs	Metals 5-Z	OCPs	PCBs	Composite 0	Composite 2	Nutrients NT-HS	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
(9)	TP223.00 0.0M	27/8/09	S	250mL SAR	1			X				X		#1
(39)	TP223.00 0.3M													
(1)	COMPOSITE 1								X					
(2)	~~COMPOSITE 2~~								X					
(40)	TP208.37 0.0M													
12	TP208.37 0.3M					X	X	X					X	
13	TP208.27 0.0M					X	X	X					X	
(41)	TP208.27 0.5M													
14	TP208.17 0.0M					X	X	X					X	
(42)	TP208.17 0.3M													
15	TP208.07 0.0M					X	X	X					X	✓
(43)	TP208.07 0.3M													
				TOTAL										

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

153814

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney:** 277 Woodpark Rd, Smithfield NSW 2164 Ph 02 8784 8555 E: samples.sydney@alsenviro.com

☐ **Newcastle:** 5 Rosegum Rd, Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com

☐ **Brisbane:** 32 Shand St, Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com

☐ **Townsville:** 14-15 Desma Ct, Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com

☐ **Melbourne:** 2-4 Westall Rd, Springvale, VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsenviro.com

☐ **Adelaide:** 2/1 Burma Rd, Pooraka SA 5095 Ph:08 8359 0890 E: adelaide@alsenviro.com

☐ **Perth:** 10 Hod Way, Malaga, WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com

☐ **Launceston:** 27 Wellington St, Launceston, TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT:	**TURNAROUND REQUIREMENTS:** (Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):	**FOR LABORATORY USE ONLY (Circle)** Custody Seal Intact? (Yes) No N/A
OFFICE:		Free ice / frozen ice bricks present upon receipt? (Yes) No N/A
PROJECT:	**ALS QUOTE NO.:**	Random Sample Temperature on Receipt: 3.8 °C
PURCHASE ORDER NUMBER:	COC SEQUENCE NUMBER (Circle) COC: 1 2 (3) 4 5 6 7	Other comment:
PROJECT MANAGER: **CONTACT PH:**	OF: 1 2 3 4 5 6 (7)	

SAMPLER: **SAMPLER MOBILE:** 0404542354	**RELINQUISHED BY:** Rhys Holmewood	**RECEIVED BY:** PETER DONAGHY	**RELINQUISHED BY:**
COC emailed to ALS? (YES / NO) **EDD FORMAT** (or default):	DATE/TIME: 27/8/09 4pm	DATE/TIME: 27/8/09 1600	DATE/TIME:
Email Reports to (will default to PM if no other addresses are listed):			**RECEIVED BY:** JESSIE
Email Invoice to (will default to PM if no other addresses are listed):			DATE/TIME: 28-8-09 - 8:20

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	TPH BTEX	PAHs	Metals S-Z	OCPs	PCBs	Nutrients NT-115			Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
16 (B)	TP207.97 0.0M	27/8/09	S	250mL JAR	1	X	X	X			X			
(44) (B)	TP207.97 0.3M													
(45) (B)	TP203.68 0.0M													
17 (B)	TP203.68 0.5M							X	X					
(46) (B)	TP203.68 1.0M													
(47) (B)	TP203.68 1.5M													
18 (B)	TP197.58 0.0M					X	X	X						
(48) (B)	TP197.58 0.3M													
19 (B)	TP197.55 0.0M					X	X	X						
(49) (B)	TP197.55 0.3M													
20 (B)	TP197.54 0.0M					X	X	X						
(50) (B)	TP197.54 0.3M	↓	↓	↓	↓									
					TOTAL									

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

153815

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney:** 277 Woodpark Rd, Smithfield NSW 2164 Ph 02 8784 8555 E: samples.sydney@alsenviro.com

☐ **Newcastle:** 5 Rosegum Rd, Warabrook NSW 2304 Ph: 02 4958 9433 E: samples.newcastle@alsenviro.com

☐ **Brisbane:** 32 Shand St, Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com

☐ **Townsville:** 14-15 Desma Ct, Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com

☐ **Melbourne:** 2-4 Westall Rd, Springvale, VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsenviro.com

☐ **Adelaide:** 2/1 Burma Rd, Pooraka SA 5095 Ph:08 8359 0890 E: adelaide@alsenviro.com

☐ **Perth:** 10 Hod Way, Malaga, WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com

☐ **Launceston:** 27 Wellington St, Launceston, TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT:	**TURNAROUND REQUIREMENTS:** (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
OFFICE:		
PROJECT:	**ALS QUOTE NO.:**	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 (4) 5 6 7
PURCHASE ORDER NUMBER:		OF: 1 2 3 4 5 6 (7)
PROJECT MANAGER:	**CONTACT PH:**	
SAMPLER:	**SAMPLER MOBILE:** 0404542354	**RELINQUISHED BY:** Rhys Holmewood DATE/TIME: 27/8/09 4pm
COC emailed to ALS? (YES / NO)	**EDD FORMAT** (or default):	**RECEIVED BY:** PETER DONAGHY DATE/TIME: 27/8/09 1600
Email Reports to (will default to PM if no other addresses are listed):		**RELINQUISHED BY:** DATE/TIME:
Email Invoice to (will default to PM if no other addresses are listed):		**RECEIVED BY:** JESS DATE/TIME: 28-8-09 8:20a.m

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: 5.8 °C

Other comment:

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	TPH BTEX	PAHs	Metals 5-2	OCPs					Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
21	TP197.40 0.0M	27/8/09	S	250mL JAR	1	X	X	X	X					
S1	TP197.40 0.5M													
S2	TP197.40 1.0M													
S3	TP197.40 1.5M													
S4	TP197.30 0.0M													
22	TP197.30 0.5M					X	X	X	X					
S5	TP197.30 1.0M													
S6	TP197.30 1.5M													
S7	TP197.20 0.0M													
S8	TP197.20 0.5M													
23	TP197.20 1.0M					X	X	X	X					
S9	TP197.20 1.5M													
					TOTAL									

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

153816

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney:** 277 Woodpark Rd, Smithfield NSW 2164 Ph 02 8784 8555 E: samples.sydney@alsenviro.com

☐ **Newcastle:** 5 Rosegum Rd, Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com

☐ **Brisbane:** 32 Shand St, Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com

☐ **Townsville:** 14-15 Desma Ct, Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com

☐ **Melbourne:** 2-4 Westall Rd, Springvale, VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsenviro.com

☐ **Adelaide:** 2/1 Burma Rd, Pooraka SA 5095 Ph:08 8359 0890 E: adelaide@alsenviro.com

☐ **Perth:** 10 Hod Way, Malaga, WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com

☐ **Launceston:** 27 Wellington St, Launceston, TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT:	**TURNAROUND REQUIREMENTS:** (Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):	**FOR LABORATORY USE ONLY (Circle)** Custody Seal Intact? (Yes) No N/A
OFFICE:		Free ice / frozen ice bricks present upon receipt? (Yes) No N/A
PROJECT:	**ALS QUOTE NO.:**	**COC SEQUENCE NUMBER (Circle)** COC: 1 2 3 4 (5) 6 7
PURCHASE ORDER NUMBER:		Random Sample Temperature on Receipt: 7.8 °C
PROJECT MANAGER:	**CONTACT PH:**	OF: 1 2 3 4 5 6 (7) Other comment:

SAMPLER: **SAMPLER MOBILE:** 0404542354	**RELINQUISHED BY:** Rhys Holmewood DATE/TIME: 27/8/09 4pm	**RECEIVED BY:** PETER DONAGHY DATE/TIME: 27/8/09 1600	**RELINQUISHED BY:** DATE/TIME:	**RECEIVED BY:** JESSIE DATE/TIME: 28-8-09 -8:20-
COC emailed to ALS? (YES / NO) **EDD FORMAT** (or default):				
Email Reports to (will default to PM if no other addresses are listed):				
Email Invoice to (will default to PM if no other addresses are listed):				

COMMENTS/ SPECIAL HANDLING/STORAGE OR DISPOSAL:

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
	SAMPLE ID	DATE/ TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	TPH BTEX	PAH	Metals S-2	OCPs					Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
24 (59)	TP197.10 0.0M	27/8/09	S	250mL JAR.	1	X	X	X	X					
(60)	TP197.10 0.5M													
(61)	TP197.10 1.0M													
(62)	TP197.10 1.5M													
(63)	TP197.00 0.0M													
25 (58)	TP197.00 0.5M					X	X	X	X					
(64)	TP197.00 1.0M													
(65)	TP197.00 1.5M													
(66)	TP196.90 0.0M													
(67)	TP196.90 0.5M													
(68)	TP196.90 1.0M													
26 (69)	TP196.90 1.5M					X	X	X	X					
				TOTAL										

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

153817

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney:** 277 Woodpark Rd, Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsenviro.com

☐ **Newcastle:** 5 Rosegum Rd, Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com

☐ **Brisbane:** 32 Shand St, Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com

☐ **Townsville:** 14-15 Desma Ct, Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com

☐ **Melbourne:** 2-4 Westall Rd, Springvale, VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsenviro.com

☐ **Adelaide:** 2/1 Burma Rd, Pooraka SA 5095 Ph:08 8359 0890 E: adelaide@alsenviro.com

☐ **Perth:** 10 Hod Way, Malaga, WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com

☐ **Launceston:** 27 Wellington St, Launceston, TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT:	**TURNAROUND REQUIREMENTS:** (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):	**FOR LABORATORY USE ONLY (Circle)** Custody Seal Intact? (Yes) No N/A
OFFICE:			Free ice / frozen ice bricks present upon receipt? (Yes) No N/A
PROJECT:	**ALS QUOTE NO.:**	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 (6) 7	Random Sample Temperature on Receipt: 0.8 °C
PURCHASE ORDER NUMBER:		OF: 1 2 3 4 5 6 (7)	Other comment:
PROJECT MANAGER:	**CONTACT PH:**		
SAMPLER:	**SAMPLER MOBILE:** 0404 542354	**RELINQUISHED BY:** Rhys Holmewood DATE/TIME: 27/8/09 4pm	**RECEIVED BY:** PETER DONAGHY DATE/TIME: 27/8/09 1600
COC emailed to ALS? (YES / NO)	**EDD FORMAT** (or default):	**RELINQUISHED BY:** DATE/TIME:	**RECEIVED BY:** JESSIE DATE/TIME: 28-8-09 – 8:20 —
Email Reports to (will default to PM if no other addresses are listed):			
Email Invoice to (will default to PM if no other addresses are listed):			

COMMENTS/ SPECIAL HANDLING/STORAGE OR DISPOSAL:

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	TPH BTEX	PAHs	Metals 5-12	OCPs					Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
27 (63)	TP196.80 0.0M	27/8/09	S	250mL JAR	1	X	X	X	X					
(64)	TP196.80 0.5M													
(70)	TP196.80 1.0M													
(71)	TP196.80 1.5M													
(72)	TP196.70 0.0M													
(73)	TP196.70 0.5M													
(74)	TP196.70 1.0M													
28 (65)	TP196.70 1.5M					X	X	X	X					
(75)	TP196.60 0.0M													
29 (66)	TP196.60 0.5M					X	X	X	X					
(76)	TP196.60 1.0M													
(77)	TP196.60 1.5M		V	V	V									
				TOTAL										

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

153818

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney:** 277 Woodpark Rd, Smithfield NSW 2164 Ph 02 8784 8555 E: samples.sydney@alsenviro.com

☐ **Newcastle:** 5 Rosegum Rd, Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com

☐ **Brisbane:** 32 Shand St, Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com

☐ **Townsville:** 14-15 Desma Ct, Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com

☐ **Melbourne:** 2-4 Westall Rd, Springvale, VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsenviro.com

☐ **Adelaide:** 2/1 Burma Rd, Pooraka SA 5095 Ph:08 8359 0890 E: adelaide@alsenviro.com

☐ **Perth:** 10 Hod Way, Malaga, WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com

☐ **Launceston:** 27 Wellington St, Launceston, TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT:	**TURNAROUND REQUIREMENTS:** (Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):	**FOR LABORATORY USE ONLY (Circle)** Custody Seal Intact? Yes No N/A
OFFICE:		Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT:	**ALS QUOTE NO.:**	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 (7)
PURCHASE ORDER NUMBER:		OF: 1 2 3 4 5 6 (7)
PROJECT MANAGER:	**CONTACT PH:**	Random Sample Temperature on Receipt: 7.8 °C Other comment:

SAMPLER: **SAMPLER MOBILE:** 0404542354	**RELINQUISHED BY:** Rhys Holmewood DATE/TIME: 27/8/09 4PM	**RECEIVED BY:** PETER DONAGHY DATE/TIME: 27/8/09 1600	**RELINQUISHED BY:** DATE/TIME:	**RECEIVED BY:** JESSIE DATE/TIME: 28-8-09 - 8:30 a
COC emailed to ALS? (YES / NO) **EDD FORMAT** (or default):				
Email Reports to (will default to PM if no other addresses are listed):				
Email Invoice to (will default to PM if no other addresses are listed):				

COMMENTS/ SPECIAL HANDLING/STORAGE OR DISPOSAL:

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	TPH/BTEX	PAH	Metals						Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
(78)	TPQA03	27/8/09	S	250mL JAR	1									
(79)	TPQA04													
(80)	TPQA05													
(81)	TPQA06													
30	TPQA07					X	X	X						
	TPQA08 – acknowledging key					X*	X*	X*						*FWD to Labmark
31	TPQA09					X	X	X						
	TPQA10 acknowledge key					X*	X*	X*						*FWD to Labmark
32	TPQA11					X	X	X	X					
(82)	TPQA12													
	Comp1													
	Comp2													
					TOTAL									

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

153819

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney**: 277 Woodpark Rd, Smithfield NSW 2164 Ph 02 8784 8555 E: samples.sydney@alsenviro.com

☑ **Newcastle**: 5 Rosegum Rd, Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com

☐ **Brisbane**: 32 Shand St, Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com

☐ **Townsville**: 14-15 Desma Ct, Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com

☐ **Melbourne**: 2-4 Westall Rd, Springvale, VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsenviro.com

☐ **Adelaide**: 2/1 Burma Rd, Pooraka SA 5095 Ph:08 8359 0890 E: adelaide@alsenviro.com

☐ **Perth**: 10 Hod Way, Malaga, WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com

☐ **Launceston**: 27 Wellington St, Launceston, TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: GHD	**TURNAROUND REQUIREMENTS:** (Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☑ Standard TAT (List due date): 31/8/09 ☐ Non Standard or urgent TAT (List due date):
OFFICE: NEWCASTLE	**FOR LABORATORY USE ONLY (Circle)** Custody Seal Intact? Yes No N/A
PROJECT: 22145452 1	**ALS QUOTE NO.:** Free ice / frozen ice bricks present upon receipt? Yes No N/A
PURCHASE ORDER NUMBER:	COC SEQUENCE NUMBER (Circle) COC: (1) 2 3 4 5 6 7 Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Alison Markley **CONTACT PH:** 49799990	OF: 1 2 3 4 5 6 (7) Other comment:
SAMPLER: Jesse Simkus **SAMPLER MOBILE:** 0404542354	**RELINQUISHED BY:** Rhys Holmwood DATE/TIME: 27/8/09 4 pm
COC emailed to ALS? (YES / NO) **EDD FORMAT** (or default):	**RECEIVED BY:** PETER DONAGHY DATE/TIME: 27/8/09 1600
Email Reports to (will default to PM if no other addresses are listed): Jesse Simkus	**RELINQUISHED BY:** DATE/TIME:
Email Invoice to (will default to PM if no other addresses are listed): Melissa Simpson	**RECEIVED BY:** 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	TPH BTEX	PAHs	Metals 5-2	OCPs	PCBs	COMPOSITE ① ①	Composite ② ②		Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
(3)	TP223.50 0.0M	27/8/09	S	250mL JAR	1			X			X			
31	TP223.50 0.3M													
32	TP223.40B 0.0M													
(4)	TP223.40B 0.3M							X						
(5)	TP223.40A 0.0M							X			X			
33	TP223.40A 0.3M													
(6)	TP223.30 0.0M							X			X			
34	TP223.30 0.3M													
(7)	TP223.20 0.0M							X				X		
35	TP223.20 0.3M													
36	TP223.10 0.0M													
(8)	TP223.10 0.3M							X				X		
				TOTAL										

Environmental Division Sydney Work Order **ES0912886**

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.

153813

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney**: 277 Woodpark Rd, Smithfield NSW 2164 Ph 02 8784 8555 E: samples.sydney@alsenviro.com
☐ **Brisbane**: 32 Shand St, Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com
☐ **Melbourne**: 2-4 Westall Rd, Springvale, VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsenviro.com
☐ **Perth**: 10 Hod Way, Malaga, WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ **Newcastle**: 5 Rosegum Rd, Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com
☐ **Townsville**: 14-15 Desma Ct, Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com
☐ **Adelaide**: 2/1 Burma Rd, Pooraka SA 5095 Ph:08 8359 0890 E: adelaide@alsenviro.com
☐ **Launceston**: 27 Wellington St, Launceston, TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT:	**TURNAROUND REQUIREMENTS:** (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
OFFICE:		
PROJECT:	**ALS QUOTE NO.:**	
PURCHASE ORDER NUMBER:		
PROJECT MANAGER:	**CONTACT PH:**	

COC SEQUENCE NUMBER (Circle)
COC: 1 (2) 3 4 5 6 7
OF: 1 2 3 4 5 6 (7)

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

SAMPLER: SAMPLER MOBILE: 0404542354	**RELINQUISHED BY:** Rhys Holmewood	**RECEIVED BY:** PETER DONAGHY	**RELINQUISHED BY:**
COC emailed to ALS? (YES / NO) EDD FORMAT (or default):	DATE/TIME: 27/8/09 4pm	DATE/TIME: 27/8/09 1600	DATE/TIME:
Email Reports to (will default to PM if no other addresses are listed):			**RECEIVED BY:**
Email Invoice to (will default to PM if no other addresses are listed):			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	TPH BTEX	PAHs	Metals 5-NZ	OCPs	PCBs	Composite ①	Composite ②	Nutrients NT-115	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
①	TP223.00 0.0M	27/8/09	S	250mL ~~AR~~	1			X				X		#1
37	TP223.00 0.3M													
(1)	COMPOSITE 1								X					
(2)	COMPOSITE 2								X					
38	TP208.37 0.0M													
(10)	TP208.37 0.3M					X	X	X					X	
(11)	TP208.27 0.0M					X	X	X					X	
39	TP208.27 0.5M													
(12)	TP208.17 0.0M					X	X	X					X	
40	TP208.17 0.3M													
(13)	TP208.07 0.0M					X	X	X					X	✓
41	TP208.07 0.3M													
					TOTAL									

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

153814

composite 1 = 3,5,6
2 = 7,8,9

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney**: 277 Woodpark Rd, Smithfield NSW 2164 Ph 02 8784 8555 E: samples.sydney@alsenviro.com

☐ **Newcastle**: 5 Rosegum Rd, Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com

☐ **Brisbane**: 32 Shand St, Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com

☐ **Townsville**: 14-15 Desma Ct, Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com

☐ **Melbourne**: 2-4 Westall Rd, Springvale, VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsenviro.com

☐ **Adelaide**: 2/1 Burma Rd, Pooraka SA 5095 Ph:08 8359 0890 E: adelaide@alsenviro.com

☐ **Perth**: 10 Hod Way, Malaga, WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com

☐ **Launceston**: 27 Wellington St, Launceston, TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT:	**TURNAROUND REQUIREMENTS:** (Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):	**FOR LABORATORY USE ONLY (Circle)** Custody Seal Intact? Yes No N/A
OFFICE:		Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT:	**ALS QUOTE NO.:**	COC SEQUENCE NUMBER (Circle) COC: 1 2 (3) 4 5 6 7
PURCHASE ORDER NUMBER:		OF: 1 2 3 4 5 6 (7)
PROJECT MANAGER:	**CONTACT PH:**	Random Sample Temperature on Receipt: °C
		Other comment:

SAMPLER: **SAMPLER MOBILE:** 0404542354	**RELINQUISHED BY:** Rhys Holmwood	**RECEIVED BY:** PETER DONAGHY	**RELINQUISHED BY:**
COC emailed to ALS? (YES / NO) **EDD FORMAT** (or default):	DATE/TIME: 27/8/09 4pm	DATE/TIME: 27/8/09 1600	DATE/TIME:
Email Reports to (will default to PM if no other addresses are listed):			**RECEIVED BY:**
Email Invoice to (will default to PM if no other addresses are listed):			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	TPH BTEX	PAHs	Metals S-2	OCPs	PCBs	Nutrients NT-115			
(14)	TP207.97 0.0M	27/8/09	S	250mL JAR	1	X	X	X			X			
A2	TP207.97 0.3M													
43	TP203.68 0.0M													
(15)	TP203.68 0.5M							X	X					
44	TP203.68 1.0M													
48	TP203.68 1.5M													
(16)	TP197.58 0.0M					X	X	X						
46	TP197.58 0.3M													
(17)	TP197.55 0.0M					X	X	X						
47	TP197.55 0.3M													
(18)	TP197.54 0.0M					X	X	X						
48	TP197.54 0.3M	↓	↓	↓	↓									
				TOTAL										

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

153815

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney**: 277 Woodpark Rd. Smithfield NSW 2164 Ph 02 8784 8555 E: samples.sydney@alsenviro.com

☐ **Newcastle**: 5 Rosegum Rd. Warabrook NSW 2304 Ph: 02 4969 9433 E: samples.newcastle@alsenviro.com

☐ **Brisbane**: 32 Shand St, Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com

☐ **Townsville**: 14-15 Desma Ct, Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com

☐ **Melbourne**: 2-4 Westall Rd, Springvale, VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsenviro.com

☐ **Adelaide**: 2/1 Burma Rd, Pooraka SA 5095 Ph:08 8359 0890 E: adelaide@alsenviro.com

☐ **Perth**: 10 Hod Way, Malaga, WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com

☐ **Launceston**: 27 Wellington St, Launceston, TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT:	**TURNAROUND REQUIREMENTS:** (Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):	**FOR LABORATORY USE ONLY (Circle)** Custody Seal Intact? Yes No N/A
OFFICE:		Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT:	**ALS QUOTE NO.:**	Random Sample Temperature on Receipt: °C
PURCHASE ORDER NUMBER:	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 (4) 5 6 7	Other comment:
PROJECT MANAGER: **CONTACT PH:**	OF: 1 2 3 4 5 6 (7)	

SAMPLER: **SAMPLER MOBILE:** 0404542354	**RELINQUISHED BY:** Rhys Holmewood	**RECEIVED BY:** PETER DONAGHY	**RELINQUISHED BY:**
COC emailed to ALS? (YES / NO) **EDD FORMAT** (or default):	DATE/TIME: 27/8/09 4pm	DATE/TIME: 27/8/09 1600	DATE/TIME:
Email Reports to (will default to PM if no other addresses are listed):			**RECEIVED BY:**
Email Invoice to (will default to PM if no other addresses are listed):			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	TPH BTEX	PAHs	Metals S-2	OCPs					Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
(19)	TP197.40 0.0M	27/8/09	S	250mL JAR	1	X	X	X	X					
49	TP197.40 0.5M													
50	TP197.40 1.0M													
51	TP197.40 1.5M													
52	TP197.30 0.0M													
(20)	TP197.30 0.5M					X	X	X	X					
53	TP197.30 1.0M													
54	TP197.30 1.5M													
55	TP197.20 0.0M													
56	TP197.20 0.5M													
(21)	TP197.20 1.0M					X	X	X	X					
57	TP197.20 1.5M													
					TOTAL									

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

153816

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney:** 277 Woodpark Rd, Smithfield NSW 2164 Ph 02 8784 8555 E: samples.sydney@alsenviro.com

☐ **Brisbane:** 32 Shand St, Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com

☐ **Melbourne:** 2-4 Westall Rd, Springvale, VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsenviro.com

☐ **Perth:** 10 Hod Way, Malaga, WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com

☐ **Newcastle:** 5 Rosegum Rd, Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com

☐ **Townsville:** 14-15 Desma Ct, Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com

☐ **Adelaide:** 2/1 Burma Rd, Pooraka SA 5095 Ph:08 8359 0890 E: adelaide@alsenviro.com

☐ **Launceston:** 27 Wellington St, Launceston, TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT:	**TURNAROUND REQUIREMENTS:** (Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):	**FOR LABORATORY USE ONLY (Circle)** Custody Seal Intact? Yes No N/A
OFFICE:		Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT:	**ALS QUOTE NO.:**	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 (5) 6 7
PURCHASE ORDER NUMBER:		OF: 1 2 3 4 5 6 (7)
PROJECT MANAGER:	**CONTACT PH:**	Random Sample Temperature on Receipt: °C
		Other comment:

SAMPLER: **SAMPLER MOBILE:** 0404542354	**RELINQUISHED BY:** Rhys Holmewood	**RECEIVED BY:** PETER DONAGHY	**RELINQUISHED BY:**	**RECEIVED BY:**
COC emailed to ALS? (YES / NO) **EDD FORMAT** (or default):	DATE/TIME: 27/8/09 4pm	DATE/TIME: 27/8/09 1600	DATE/TIME:	DATE/TIME:
Email Reports to (will default to PM if no other addresses are listed):				
Email Invoice to (will default to PM if no other addresses are listed):				

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	TPH BTEX	PAH	Metals S-2	OCPs					Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
(22)	TP197.10 0.0M	27/8/09	S	250mL JAR.	1	X	X	X	X					
58	TP197.10 0.5M													
59	TP197.10 1.0M													
60	TP197.10 1.5M													
61	TP197.00 0.0M													
(23)	TP197.00 0.5M					X	X	X	X					
62	TP197.00 1.0M													
63	TP197.00 1.5M													
64	TP196.90 0.0M													
65	TP196.90 0.5M													
66	TP196.90 1.0M													
(24)	TP196.90 1.5M					X	X	X	X					
					TOTAL									

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic; V = VCA 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.

153817

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney**: 277 Woodpark Rd, Smithfield NSW 2164 Ph 02 8784 8555 E: samples.sydney@alsenviro.com
☐ **Newcastle**: 5 Rosegum Rd, Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com
☐ **Brisbane**: 32 Shand St, Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com
☐ **Townsville**: 14-15 Desma Ct, Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com
☐ **Melbourne**: 2-4 Westall Rd, Springvale, VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsenviro.com
☐ **Adelaide**: 2/1 Burma Rd, Pooraka SA 5095 Ph:08 8359 0890 E: adelaide@alsenviro.com
☐ **Perth**: 10 Hod Way, Malaga, WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ **Launceston**: 27 Wellington St, Launceston, TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT:	**TURNAROUND REQUIREMENTS:** (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
OFFICE:		
PROJECT:	**ALS QUOTE NO.:**	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 (6) 7 OF: 1 2 3 4 5 6 (7)
PURCHASE ORDER NUMBER:		
PROJECT MANAGER:	**CONTACT PH:**	

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:

SAMPLER: **SAMPLER MOBILE:** 0404 542354	**RELINQUISHED BY:** Rhys Holmewood	**RECEIVED BY:** PETER DONAGHY	**RELINQUISHED BY:**
COC emailed to ALS? (YES / NO) **EDD FORMAT** (or default):	DATE/TIME: 27/8/09 4pm	DATE/TIME: 27/8/09 1600	DATE/TIME:
Email Reports to (will default to PM if no other addresses are listed):			**RECEIVED BY:**
Email Invoice to (will default to PM if no other addresses are listed):			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	TPH BTEX	PAHs	Metals 5-2	OCPs					Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
(25)	TP196.80 0.0M	27/8/09	S	250mL JAR	1	X	X	X	X					
67	TP196.80 0.5M													
68	TP196.80 1.0M													
69	TP196.80 1.5M													
70	TP196.70 0.0M													
71	TP196.70 0.5M													
72	TP196.70 1.0M													
(26)	TP196.70 1.5M					X	X	X	X					
73	TP196.60 0.0M													
(27)	TP196.60 0.5M					X	X	X	X					
74	TP196.60 1.0M													
75	TP196.60 1.5M													
					TOTAL									

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

153818

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney**: 277 Woodpark Rd, Smithfield NSW 2164 Ph 02 8784 8555 E: samples.sydney@alsenviro.com

☐ **Newcastle**: 5 Rosegum Rd, Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com

☐ **Brisbane**: 32 Shand St, Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com

☐ **Townsville**: 14-15 Desma Ct, Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com

☐ **Melbourne**: 2-4 Westall Rd, Springvale, VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsenviro.com

☐ **Adelaide**: 2/1 Burma Rd, Pooraka SA 5095 Ph:08 8359 0890 E: adelaide@alsenviro.com

☐ **Perth**: 10 Hod Way, Malaga, WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com

☐ **Launceston**: 27 Wellington St, Launceston, TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT:	**TURNAROUND REQUIREMENTS:** (Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):	**FOR LABORATORY USE ONLY (Circle)** Custody Seal Intact? Yes No N/A
OFFICE:		Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT:	**ALS QUOTE NO.:**	Random Sample Temperature on Receipt: °C
PURCHASE ORDER NUMBER:	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 (7)	Other comment:
PROJECT MANAGER: **CONTACT PH:**	OF: 1 2 3 4 5 6 (7)	

SAMPLER: **SAMPLER MOBILE:** 0404542354	**RELINQUISHED BY:** Rhys Holmewood	**RECEIVED BY:** PETER DONAGHY	**RELINQUISHED BY:**
COC emailed to ALS? (YES / NO) **EDD FORMAT** (or default):	DATE/TIME: 27/8/09 4PM	DATE/TIME: 27/8/09 1600	DATE/TIME:
Email Reports to (will default to PM if no other addresses are listed):			**RECEIVED BY:**
Email Invoice to (will default to PM if no other addresses are listed):			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	TPH TRH MTBE	PAH	Metals 4	OCP					Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
76	TPQA03	27/8/09	S	250mL JAR	1									
77	TPQA04	"	"	"	"									
78	TPQA05	"	"	"	"									
79	TPQA06	"	"	"	"									
(88)	TPQA07	"	"	"	"	X	X	X						
	TPQA08	"	"	"	"	X*	X*	X*						*FWD to Labmark
(89)	TPQA09	"	"	"	"	X	X	X						
	TPQA10	"	"	"	"	X*	X*	X*						*FWD to Labmark
(30)	TPQA11	"	"	"	"	X	X	X	X					
80	TPQA12	"	"	"	"									
				TOTAL										

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

153819

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **ES0912754**

Client	: **GHD SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR JESSE SIMKUS	Contact	: Charlie Pierce
Address	: PO BOX 5403 NEWCASTLE WEST NSW, AUSTRALIA 2302	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jesse.simkus@ghd.com.au	E-mail	: charlie.pierce@alsenviro.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 221454521	Page	: 1 of 3
Order number	: ----		
C-O-C number	: 153810-812	Quote number	: EM2009GHDSER0392 (EN/005/09)
Site	: NEWCASTLE		
Sampler	: JS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 26-AUG-2009	Issue Date	: 27-AUG-2009 12:02
Client Requested Due Date	: 31-AUG-2009	Scheduled Reporting Date	: **01-SEP-2009**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 5.6' C SYD - Ice present
No. of coolers/boxes	: 1 HARD	No. of samples received	: 29
Sercurity Seal	: Intact.	No. of samples analysed	: 12

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Sample TPQA02 will be forwarded to Labmark as per COC.**
- **Sample TP215.62 1.0M and TP215.62 1.5M not received by ALS Sydney.**
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Please direct any queries related to sample condition / numbering / breakages to Jacob Waugh
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (90 days) from date of completion of work order.

Sample Container(s)/Preservation Non-Compliances

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

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process neccessary 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.
When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	(On Hold) SOIL No analysis requested	SOIL - EP066 (solids) Polychlorinated Biphenyls by GCMS	SOIL - EP068A (solids) Organochlorine Pesticides by GCMS	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-07 TPH/BTEX/PAH (SIM)
ES0912754-001	26-AUG-2009 15:00	TP222.90 0.0M			✓	✓	
ES0912754-002	26-AUG-2009 15:00	TP216.02 0.5M			✓	✓	✓
ES0912754-003	26-AUG-2009 15:00	TP215.91 0.0M			✓	✓	✓
ES0912754-004	26-AUG-2009 15:00	TP215.82 0.0M			✓	✓	✓
ES0912754-005	26-AUG-2009 15:00	TP215.71 0.5M			✓	✓	✓
ES0912754-006	26-AUG-2009 15:00	TP215.62 0.0M			✓	✓	✓
ES0912754-007	26-AUG-2009 15:00	TP215.56 0.0M			✓	✓	✓
ES0912754-008	26-AUG-2009 15:00	TP215.48 0.0M		✓		✓	✓
ES0912754-009	26-AUG-2009 15:00	TP214.77 0.0M			✓	✓	
ES0912754-010	26-AUG-2009 15:00	TP214.70 0.0M			✓	✓	
ES0912754-011	26-AUG-2009 15:00	TP214.66 0.0M			✓	✓	
ES0912754-012	26-AUG-2009 15:00	TPQA01			✓	✓	✓
ES0912754-013	26-AUG-2009 15:00	TP222.90 0.3M	✓				
ES0912754-014	26-AUG-2009 15:00	TP216.02 0.0M	✓				
ES0912754-015	26-AUG-2009 15:00	TP216.02 1.0M	✓				
ES0912754-016	26-AUG-2009 15:00	TP216.02 1.5M	✓				
ES0912754-017	26-AUG-2009 15:00	TP215.91 0.5M	✓				
ES0912754-018	26-AUG-2009 15:00	TP215.91 1.0M	✓				
ES0912754-019	26-AUG-2009 15:00	TP215.91 1.5M	✓				
ES0912754-020	26-AUG-2009 15:00	TP215.82 0.5M	✓				
ES0912754-021	26-AUG-2009 15:00	TP215.71 0.0M	✓				
ES0912754-022	26-AUG-2009 15:00	TP215.71 1.0M	✓				
ES0912754-023	26-AUG-2009 15:00	TP215.71 1.5M	✓				
ES0912754-024	26-AUG-2009 15:00	TP215.62 0.5M	✓				
ES0912754-025	26-AUG-2009 15:00	TP215.56 0.5M	✓				
ES0912754-026	26-AUG-2009 15:00	TP215.48 0.3M	✓				
ES0912754-027	26-AUG-2009 15:00	TP214.77 0.5M	✓				
ES0912754-028	26-AUG-2009 15:00	TP214.70 0.5M	✓				
ES0912754-029	26-AUG-2009 15:00	TP214.66 0.3M	✓				

Requested Deliverables

MR JESSE SIMKUS

- *AU Certificate of Analysis - NATA (COA)	Email	jesse.simkus@ghd.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	jesse.simkus@ghd.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	jesse.simkus@ghd.com.au
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	jesse.simkus@ghd.com.au
- Default - Chain of Custody (COC)	Email	jesse.simkus@ghd.com.au
- EDI Format - ENMRG (ENMRG)	Email	jesse.simkus@ghd.com.au
- EDI Format - ESDAT (ESDAT)	Email	jesse.simkus@ghd.com.au
- EDI Format - GHDNEW (GHDNEW)	Email	jesse.simkus@ghd.com.au

MS ALISON MONKLEY

- *AU Certificate of Analysis - NATA (COA)	Email	alison.monkley@ghd.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	alison.monkley@ghd.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	alison.monkley@ghd.com.au
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	alison.monkley@ghd.com.au
- Default - Chain of Custody (COC)	Email	alison.monkley@ghd.com.au
- EDI Format - ENMRG (ENMRG)	Email	alison.monkley@ghd.com.au
- EDI Format - ESDAT (ESDAT)	Email	alison.monkley@ghd.com.au
- EDI Format - GHDNEW (GHDNEW)	Email	alison.monkley@ghd.com.au

MS MELISSA SIMPSON

- A4 - AU Tax Invoice (INV)	Email	Melissa.Simpson@ghd.com.au

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES0912754**	Page	: 1 of 7
Client	: GHD SERVICES PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: MR JESSE SIMKUS	Contact	: Charlie Pierce
Address	: PO BOX 5403 NEWCASTLE WEST NSW, AUSTRALIA 2302	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jesse.simkus@ghd.com.au	E-mail	: charlie.pierce@alsenviro.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 221454521	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: NEWCASTLE		
C-O-C number	: 153810-812	Date Samples Received	: 26-AUG-2009
Sampler	: JS	Issue Date	: 01-SEP-2009
Order number	: ----		
		No. of samples received	: 29
Quote number	: EN/005/09	No. of samples analysed	: 12

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non -volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

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							
Soil Glass Jar - Unpreserved							
TP222.90 0.0M, TP216.02 0.5M, TP215.91 0.0M, TP215.82 0.0M, TP215.71 0.5M, TP215.62 0.0M, TP215.56 0.0M, TP215.48 0.0M, TP214.77 0.0M, TP214.70 0.0M, TP214.66 0.0M, TPQA01	**26-AUG-2009**	**----**	----	----	**27-AUG-2009**	02-SEP-2009	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved							
TP222.90 0.0M, TP216.02 0.5M, TP215.91 0.0M, TP215.82 0.0M, TP215.71 0.5M, TP215.62 0.0M, TP215.56 0.0M, TP215.48 0.0M, TP214.77 0.0M, TP214.70 0.0M, TP214.66 0.0M, TPQA01	**26-AUG-2009**	**27-AUG-2009**	23-SEP-2009	✓	**28-AUG-2009**	22-FEB-2010	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved							
TP222.90 0.0M, TP216.02 0.5M, TP215.91 0.0M, TP215.82 0.0M, TP215.71 0.5M, TP215.62 0.0M, TP215.56 0.0M, TP215.48 0.0M, TP214.77 0.0M, TP214.70 0.0M, TP214.66 0.0M, TPQA01	**26-AUG-2009**	**27-AUG-2009**	23-SEP-2009	✓	**28-AUG-2009**	23-SEP-2009	✓
EP066: Polychlorinated Biphenyls (PCB)							
Soil Glass Jar - Unpreserved							
TP215.48 0.0M	**26-AUG-2009**	**27-AUG-2009**	09-SEP-2009	✓	**28-AUG-2009**	06-OCT-2009	✓

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
EP068A: Organochlorine Pesticides (OC)								
Soil Glass Jar - Unpreserved								
TP222.90 0.0M,	TP216.02 0.5M,	**26-AUG-2009**	**27-AUG-2009**	09-SEP-2009	✓	**28-AUG-2009**	06-OCT-2009	✓
TP215.91 0.0M,	TP215.82 0.0M,							
TP215.71 0.5M,	TP215.62 0.0M,							
TP215.56 0.0M,	TP214.77 0.0M,							
TP214.70 0.0M,	TP214.66 0.0M,							
TPQA01								
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved								
TP216.02 0.5M,	TP215.91 0.0M,	**26-AUG-2009**	**27-AUG-2009**	09-SEP-2009	✓	**29-AUG-2009**	06-OCT-2009	✓
TP215.82 0.0M,	TP215.71 0.5M,							
TP215.62 0.0M,	TP215.56 0.0M,							
TP215.48 0.0M,	TPQA01							
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved								
TP216.02 0.5M,	TP215.91 0.0M,	**26-AUG-2009**	**27-AUG-2009**	09-SEP-2009	✓	**29-AUG-2009**	06-OCT-2009	✓
TP215.82 0.0M,	TP215.71 0.5M,							
TP215.62 0.0M,	TP215.56 0.0M,							
TP215.48 0.0M,	TPQA01							
EP080: BTEX								
Soil Glass Jar - Unpreserved								
TP216.02 0.5M,	TP215.91 0.0M,	**26-AUG-2009**	**27-AUG-2009**	09-SEP-2009	✓	**29-AUG-2009**	09-SEP-2009	✓
TP215.82 0.0M,	TP215.71 0.5M,							
TP215.62 0.0M,	TP215.56 0.0M,							
TP215.48 0.0M,	TPQA01							

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	2	19	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	9	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	3	24	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	19	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	24	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	24	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Pesticides by GCMS	EP068	1	19	**5.3**	**5.0**	✓	ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	9	**11.1**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	17	**5.9**	**5.0**	✓	ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	24	**8.3**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	19	**5.3**	**5.0**	✓	ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (1999) Schedule B(3) (Method 102)
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) 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 (1999) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 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 (1999) Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 504)
Pesticides by GCMS	EP068	SOIL	(USEPA SW 846 - 8270B) 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 (1999) Schedule B(3) (Method 504,505)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. 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 (1999) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option A - Concentrating)	ORG17A	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

Preparation Methods	Method	Matrix	Method Descriptions
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EG005T: Total Metals by ICP-AES	ES0912629-001	Anonymous	**Zinc**	7440-66-6	20.5 %	0-20%	**RPD exceeds LOR based limits**
Laboratory Control Spike (LCS) Recoveries							
EP068A: Organochlorine Pesticides (OC)	1245642-002	----	**Endrin**	72-20-8	123 %	63-121%	**Recovery greater than upper control limit**

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Matrix Spike outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

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

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

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

QUALITY CONTROL REPORT

Work Order	: **ES0912754**	Page	: 1 of 10
Client	: **GHD SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR JESSE SIMKUS	Contact	: Charlie Pierce
Address	: PO BOX 5403 NEWCASTLE WEST NSW, AUSTRALIA 2302	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jesse.simkus@ghd.com.au	E-mail	: charlie.pierce@alsenviro.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 221454521	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: NEWCASTLE		
C-O-C number	: 153810-812	Date Samples Received	: 26-AUG-2009
Sampler	: JS	Issue Date	: 01-SEP-2009
Order number	: ----		
		No. of samples received	: 29
Quote number	: EN/005/09	No. of samples analysed	: 12

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

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

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Alex Rossi	Organic Chemist	Organics
Celine Conceicao	Spectroscopist	Inorganics
Edwandy Fadjar	Senior Organic Chemist	Organics
Hoa Nguyen	Inorganic Chemist	Inorganics
Sanjeshni Jyoti Mala	Senior Chemist Volatile	Organics
Wisam Abou-Maraseh	Spectroscopist	Inorganics

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 insuffient sample for analysis.

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

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

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 (QC Lot: 1082697)									
ES0912754-001	TP222.90 0.0M	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	14.3	15.6	8.8	0% - 50%
ES0912754-010	TP214.70 0.0M	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	8.4	8.8	3.7	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 1082411)									
ES0912629-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	18	15	18.8	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	18	15	15.6	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	37	27	29.8	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	62	65	4.3	0% - 50%
		EG005T: Zinc	7440-66-6	5	mg/kg	118	96	# 20.5	0% - 50%
ES0912754-002	TP216.02 0.5M	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	7	6	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	21	22	0.0	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	23	28	20.7	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	9	7	19.2	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	21	22	5.2	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 1082414)									
ES0912754-012	TPQA01	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	6	5	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	25	24	5.3	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	26	28	5.4	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	8	8	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	19	22	15.4	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1082412)									
ES0912629-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.2	<0.1	75.3	No Limit
ES0912754-002	TP216.02 0.5M	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 1082691)									
ES0912621-002	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.10	mg/kg	<0.10	<0.10	0.0	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1082690)									
ES0912621-002	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1082690) - continued									
ES0912621-002	Anonymous	EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
ES0912754-009	TP214.77 0.0M	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1082693)									

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: 1082693) - continued									
ES0912621-002	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES0912754-004	TP215.82 0.0M	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	0.8	0.8	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1082345)									
ES0912754-002	TP216.02 0.5M	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES0912816-003	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1082692)									
ES0912621-002	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit

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 (%)*
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1082692) - continued									
ES0912754-004	TP215.82 0.0M	EP071: C15 - C28 Fraction	----	100	mg/kg	160	150	7.1	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	130	140	9.7	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEX (QC Lot: 1082345)									
ES0912754-002	TP216.02 0.5M	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES0912816-003	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method 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: 1082411)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.1 mg/kg	113	90.1	124
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.76 mg/kg	103	83.3	111
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.9 mg/kg	104	89.2	117
EG005T: Copper	7440-50-8	5	mg/kg	<5	54.7 mg/kg	102	90.1	114
EG005T: Lead	7439-92-1	5	mg/kg	<5	55.2 mg/kg	101	85.2	111
EG005T: Nickel	7440-02-0	2	mg/kg	<2	54.8 mg/kg	104	88.3	116
EG005T: Zinc	7440-66-6	5	mg/kg	<5	104 mg/kg	102	88.9	112
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1082412)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.4 mg/kg	82.6	67	118
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 1082691)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.10	0.5 mg/kg	106	57.4	117
EP068A: Organochlorine Pesticides (OC) (QCLot: 1082690)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.25 mg/kg	94.7	60.8	116
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.25 mg/kg	95.9	59.4	115
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.25 mg/kg	98.2	59.8	117
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.25 mg/kg	96.9	59.8	118
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.25 mg/kg	98.6	65.8	114
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.25 mg/kg	95.3	65.6	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.25 mg/kg	97.7	67	113
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.25 mg/kg	101	65.6	113
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.25 mg/kg	102	60.7	113
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.25 mg/kg	102	65.8	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.25 mg/kg	101	57.3	120
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.25 mg/kg	103	67.4	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.25 mg/kg	102	67.5	114
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.25 mg/kg	# 123	63	121
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.25 mg/kg	105	66.1	117
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.25 mg/kg	106	65.3	116
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.25 mg/kg	92.6	57.3	115
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.25 mg/kg	97.7	63.6	119
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.25 mg/kg	102	58.4	127
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.25 mg/kg	94.8	63.6	117
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.25 mg/kg	114	50.4	132
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1082693)								

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: 1082693) - continued								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	96.0	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	101	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	99.8	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	98.6	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	97.3	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	101	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	100	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	102	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	91.4	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	95.2	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	88.9	71.8	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	80.0	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	94.0	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	82.2	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	83.4	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	73.2	72.4	114
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1082345)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	72.7	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1082692)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	101	75.2	116
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	200 mg/kg	89.0	75.3	113
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	99.0	72.6	117
EP080: BTEX (QCLot: 1082345)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	75.7	67.5	125
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	71.2	69	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	79.8	65.3	126
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	82.6	66.5	124
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	85.3	66.7	123

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 1082411)							
ES0912629-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	91.6	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	92.0	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	84.4	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	96.6	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	87.4	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	89.7	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	81.9	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1082412)							
ES0912629-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	91.0	70	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 1082691)							
ES0912621-002	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.5 mg/kg	130	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 1082690)							
ES0912621-002	Anonymous	EP068: gamma-BHC	58-89-9	0.25 mg/kg	100	75.65	110.44
		EP068: Heptachlor	76-44-8	0.25 mg/kg	104	72.2	106.71
		EP068: Aldrin	309-00-2	0.25 mg/kg	82.9	77.54	107.0
		EP068: Dieldrin	60-57-1	0.25 mg/kg	85.5	76.37	109.7
		EP068: Endrin	72-20-8	1 mg/kg	103	68.51	119.47
		EP068: 4.4`-DDT	50-29-3	1 mg/kg	72.5	67.12	118.10
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1082693)							
ES0912621-002	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	73.1	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	84.9	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1082345)							
ES0912816-003	Anonymous	EP080: C6 - C9 Fraction	----	25 mg/kg	72.8	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1082692)							
ES0912621-002	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	98.8	70	130
		EP071: C15 - C28 Fraction	----	3140 mg/kg	104	70	130
		EP071: C29 - C36 Fraction	----	2860 mg/kg	93.7	70	130
EP080: BTEX (QCLot: 1082345)							
ES0912816-003	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	72.2	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	73.5	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	79.0	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	77.7	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	81.4	70	130

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES0912754**	Page	: 1 of 13
Client	: **GHD SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR JESSE SIMKUS	Contact	: Charlie Pierce
Address	: PO BOX 5403 NEWCASTLE WEST NSW, AUSTRALIA 2302	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jesse.simkus@ghd.com.au	E-mail	: charlie.pierce@alsenviro.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 221454521	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: 153810-812	Date Samples Received	: 26-AUG-2009
Sampler	: JS	Issue Date	: 01-SEP-2009
Site	: NEWCASTLE		
		No. of samples received	: 29
Quote number	: EN/005/09	No. of samples analysed	: 12

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Alex Rossi	Organic Chemist	Organics
Celine Conceicao	Spectroscopist	Inorganics
Edwandy Fadjar	Senior Organic Chemist	Organics
Hoa Nguyen	Inorganic Chemist	Inorganics
Sanjeshni Jyoti Mala	Senior Chemist Volatile	Organics
Wisam Abou-Maraseh	Spectroscopist	Inorganics

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 insuffient 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 date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

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

- **EG005T: Poor precision was obtained for Zinc on sample ES0912629#1 due to sample heterogeneity.**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: TP222.90 0.0M	TP216.02 0.5M	TP215.91 0.0M	TP215.82 0.0M	TP215.71 0.5M
				Client sampling date / time: 26-AUG-2009 15:00	26-AUG-2009 15:00	26-AUG-2009 15:00	26-AUG-2009 15:00	26-AUG-2009 15:00
				ES0912754-001	ES0912754-002	ES0912754-003	ES0912754-004	ES0912754-005
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	**14.3**	**9.6**	**10.6**	**9.4**	**12.9**
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**7**	<5	**23**	**42**	**78**
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**17**	**7**	**18**	**18**	**16**
Copper	7440-50-8	5	mg/kg	**14**	**23**	**21**	**66**	**47**
Lead	7439-92-1	5	mg/kg	**17**	**9**	**58**	**122**	**282**
Nickel	7440-02-0	2	mg/kg	**9**	**21**	**26**	**12**	**18**
Zinc	7440-66-6	5	mg/kg	**42**	**21**	**232**	**294**	**126**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: TP222.90 0.0M Client sampling date / time: 26-AUG-2009 15:00 ES0912754-001	TP216.02 0.5M 26-AUG-2009 15:00 ES0912754-002	TP215.91 0.0M 26-AUG-2009 15:00 ES0912754-003	TP215.82 0.0M 26-AUG-2009 15:00 ES0912754-004	TP215.71 0.5M 26-AUG-2009 15:00 ES0912754-005
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Phenanthrene	85-01-8	0.5	mg/kg	----	<0.5	**0.9**	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	----	<0.5	**0.8**	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	----	<0.5	**0.6**	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	----	<0.5	<0.5	**0.8**	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	----	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	----	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	----	**230**	**330**	**160**	**120**
C29 - C36 Fraction	----	100	mg/kg	----	**120**	**140**	**130**	**100**
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	**103**	**105**	**93.4**	**105**	**109**
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	**97.5**	**100**	**84.3**	**103**	**110**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	----	**52.6**	**80.5**	**71.8**	**88.4**
2-Chlorophenol-D4	93951-73-6	0.1	%	----	**48.1**	**82.8**	**77.5**	**89.6**
2.4.6-Tribromophenol	118-79-6	0.1	%	----	**35.0**	**78.8**	**67.5**	**81.3**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	----	**86.2**	**84.7**	**85.1**	**95.1**
Anthracene-d10	1719-06-8	0.1	%	----	**73.1**	**84.0**	**86.9**	**88.2**
4-Terphenyl-d14	1718-51-0	0.1	%	----	**102**	**103**	**99.3**	**108**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	----	**94.6**	**113**	**97.2**	**117**

Analytical Results

Sub-Matrix: SOIL				Client sample ID	TP222.90 0.0M	TP216.02 0.5M	TP215.91 0.0M	TP215.82 0.0M	TP215.71 0.5M
				Client sampling date / time	26-AUG-2009 15:00	26-AUG-2009 15:00	26-AUG-2009 15:00	26-AUG-2009 15:00	26-AUG-2009 15:00
Compound	CAS Number	LOR	Unit		ES0912754-001	ES0912754-002	ES0912754-003	ES0912754-004	ES0912754-005
EP080S: TPH(V)/BTEX Surrogates - Continued									
Toluene-D8	2037-26-5	0.1	%		----	**88.8**	**104**	**93.0**	**107**
4-Bromofluorobenzene	460-00-4	0.1	%		----	**88.0**	**107**	**97.7**	**115**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: TP215.62 0.0M	TP215.56 0.0M	TP215.48 0.0M	TP214.77 0.0M	TP214.70 0.0M
Client sampling date / time				26-AUG-2009 15:00	26-AUG-2009 15:00	26-AUG-2009 15:00	26-AUG-2009 15:00	26-AUG-2009 15:00
				ES0912754-006	ES0912754-007	ES0912754-008	ES0912754-009	ES0912754-010
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	**11.9**	**5.4**	**8.3**	**10.6**	**8.4**
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**69**	<5	**193**	**36**	**7**
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**173**	**22**	**15**	**16**	**12**
Copper	7440-50-8	5	mg/kg	**40**	**18**	**22**	**15**	**7**
Lead	7439-92-1	5	mg/kg	**70**	**30**	**50**	**25**	**12**
Nickel	7440-02-0	2	mg/kg	**14**	**14**	**18**	**12**	**9**
Zinc	7440-66-6	5	mg/kg	**95**	**178**	**57**	**65**	**34**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	**0.4**	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.10	mg/kg	----	----	<0.10	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	----	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	----	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	----	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	----	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	----	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	----	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	----	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	----	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	----	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	----	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	----	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	----	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	----	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	----	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	----	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	----	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	----	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	----	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	----	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	----	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	----	<0.2	<0.2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: TP215.62 0.0M Client sampling date / time: 26-AUG-2009 15:00 ES0912754-006	TP215.56 0.0M 26-AUG-2009 15:00 ES0912754-007	TP215.48 0.0M 26-AUG-2009 15:00 ES0912754-008	TP214.77 0.0M 26-AUG-2009 15:00 ES0912754-009	TP214.70 0.0M 26-AUG-2009 15:00 ES0912754-010
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	**0.5**	<0.5	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	**0.6**	<0.5	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	----	----
C15 - C28 Fraction	----	100	mg/kg	**280**	<100	<100	----	----
C29 - C36 Fraction	----	100	mg/kg	**470**	<100	<100	----	----
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	----	----	**90.0**	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	**87.7**	**98.3**	----	**107**	**100**
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	**85.8**	**87.6**	----	**116**	**98.7**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**93.0**	**81.3**	**96.2**	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**95.3**	**95.4**	**99.8**	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**81.4**	**76.8**	**97.3**	----	----
EP075(SIM)T: PAH Surrogates								

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: TP215.62 0.0M	TP215.56 0.0M	TP215.48 0.0M	TP214.77 0.0M	TP214.70 0.0M
				Client sampling date / time: 26-AUG-2009 15:00	26-AUG-2009 15:00	26-AUG-2009 15:00	26-AUG-2009 15:00	26-AUG-2009 15:00
				ES0912754-006	ES0912754-007	ES0912754-008	ES0912754-009	ES0912754-010
EP075(SIM)T: PAH Surrogates - Continued								
2-Fluorobiphenyl	321-60-8	0.1	%	**96.9**	**84.3**	**102**	----	----
Anthracene-d10	1719-06-8	0.1	%	**99.8**	**88.1**	**103**	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**115**	**103**	**115**	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**93.9**	**108**	**101**	----	----
Toluene-D8	2037-26-5	0.1	%	**92.1**	**101**	**90.5**	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**98.3**	**112**	**99.6**	----	----

Analytical Results

Sub-Matrix: SOIL				Client sample ID	TP214.66 0.0M	TPQA01	----	----	----
				Client sampling date / time	26-AUG-2009 15:00	26-AUG-2009 15:00	----	----	----
Compound	CAS Number	LOR	Unit		ES0912754-011	ES0912754-012	----	----	----
EA055: Moisture Content									
^ Moisture Content (dried @ 103°C)	----	1.0	%		12.7	11.0	----	----	----
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	<5	----	----	----
Cadmium	7440-43-9	1	mg/kg		<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg		9	6	----	----	----
Copper	7440-50-8	5	mg/kg		<5	26	----	----	----
Lead	7439-92-1	5	mg/kg		7	8	----	----	----
Nickel	7440-02-0	2	mg/kg		3	25	----	----	----
Zinc	7440-66-6	5	mg/kg		10	19	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	----	----	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	----	----	----
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	----	----	----
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	----	----	----
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	----	----	----
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	----	----	----
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	----	----	----
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	----	----	----
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	----	----	----

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID	TP214.66 0.0M	TPQA01	----	----	----
				Client sampling date / time	26-AUG-2009 15:00	26-AUG-2009 15:00	----	----	----
					ES0912754-011	ES0912754-012	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
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)fluoranthene	205-99-2	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	----	----	----	
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	----	**250**	----	----	----	
C29 - C36 Fraction	----	100	mg/kg	----	**150**	----	----	----	
EP080: BTEX									
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	----	----	----	
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.1	%	----	**78.8**	**88.7**	----	----	
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.1	%	----	**72.8**	**95.2**	----	----	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%	----	**74.1**	----	----	----	
2-Chlorophenol-D4	93951-73-6	0.1	%	----	**71.1**	----	----	----	
2.4.6-Tribromophenol	118-79-6	0.1	%	----	**45.7**	----	----	----	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%	----	**89.5**	----	----	----	
Anthracene-d10	1719-06-8	0.1	%	----	**79.4**	----	----	----	
4-Terphenyl-d14	1718-51-0	0.1	%	----	**106**	----	----	----	
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%	----	**113**	----	----	----	

Analytical Results

Sub-Matrix: SOIL			Client sample ID	TP214.66 0.0M	TPQA01	----	----	----
			Client sampling date / time	26-AUG-2009 15:00	26-AUG-2009 15:00	----	----	----
Compound	CAS Number	LOR	Unit	ES0912754-011	ES0912754-012	----	----	----
EP080S: TPH(V)/BTEX Surrogates - Continued								
Toluene-D8	2037-26-5	0.1	%	----	**100**	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	----	**105**	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	10	164
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	10	136
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	10	136
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	24	113
2-Chlorophenol-D4	93951-73-6	23	134
2.4.6-Tribromophenol	118-79-6	19	122
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	30	115
Anthracene-d10	1719-06-8	27	133
4-Terphenyl-d14	1718-51-0	18	137
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney**: 277 Woodpark Rd, Smithfield NSW 2164 Ph 02 8784 8555 E: samples.sydney@alsenviro.com

☑ **Newcastle**: 5 Rosegum Rd, Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com

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☐ **Melbourne**: 2-4 Westall Rd, Springvale, VIC 3 Ph: 03 8549 9600 E: samples.melbourne@als

☐ **Adelaide**: 2/1 Burma Rd, Pooraka SA 5095 Ph:08 8359 0890 E: adelaide@alsenviro.com

☐ **Perth**: 10 Hod Way, Malaga, WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com

☐ **Launceston**: 27 Wellington St, Launceston, TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

1/9/09 as per variation

CLIENT: GHD	**TURNAROUND REQUIREMENTS:** (Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☑ Standard TAT (List due date): ~~27/8/09~~ 31/8/09 ☐ Non Standard or urgent TAT (List due date):
OFFICE: NEWCASTLE	
PROJECT: 21454521	**ALS QUOTE NO.:**
PURCHASE ORDER NUMBER:	COC SEQUENCE NUMBER (Circle) COC: (1) 2 3 4 5 6 7
PROJECT MANAGER: Alison Monkley	**CONTACT PH:** 49799990 OF: (1) 2 3 4 5 6 7
SAMPLER: Jesse Simkus	**SAMPLER MOBILE:** 0404542354
COC emailed to ALS? (YES / NO)	**EDD FORMAT** (or default):
Email Reports to (will default to PM if no other addresses are listed): Jesse Simkus	
Email Invoice to (will default to PM if no other addresses are listed): Melissa Simpson	

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: 3.6 °C
Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Rhys Holmwood	Hayley Wolfe Newcastle	Hayley Wolfe Newcastle	JESSIE -
DATE/TIME: 26/8/09 4pm	DATE/TIME: 26/8/09 4pm	DATE/TIME: 26/8/09 5pm	DATE/TIME: 27-8-09 - 8:00am

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	TPH BTEX	PAHs	Metals S-2	OCPs	PCBs				Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
①	TP222.90 0.0M	26/8/09	S	250mL JAR	1			X	X		URGENT			
17	TP222-90 0.3M													
18	TP216.02 0.0M													
②	TP216.02 0.5M					X	X	X	X					
15	TP216.02 1.0M													
16	TP216.02 1.5M													
③	TP215.91 0.0M					X	X	X	X					
14	TP215.91 0.5M													
13	TP215.91 1.0M													
⑤	TP215.91 1.5M													
④	TP215.82 0.0M					X	X	X	X					
12	TP215.82 0.5M													
					TOTAL									

Subcon / ~~Forward Lab~~ / Split WO
Lab / Analysis: Labmark
Organised By / Date:
Relinquished By / Date:
Connote / Courier:
WO No:
Attach By PO / Internal Sheet:

Environmental Division
Sydney
Work Order
ES0912754

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.

153810

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney**: 277 Woodpark Rd, Smithfield NSW 2164 Ph 02 8784 8555 E: samples.sydney@alsenviro.com
☐ **Newcastle**: 5 Rosegum Rd, Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com
☐ **Brisbane**: 32 Shand St, Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com
☐ **Townsville**: 14-15 Desma Ct, Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com
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☐ **Perth**: 10 Hod Way, Malaga, WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ **Launceston**: 27 Wellington St, Launceston, TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT:
OFFICE:
PROJECT:
PURCHASE ORDER NUMBER:
PROJECT MANAGER: **CONTACT PH:**

TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)
☐ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.:

COC SEQUENCE NUMBER (Circle)
COC: 1 (2) 3 4 5 6 7
OF: 1 2 (3) 4 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? (Yes) No N/A
Free ice / frozen ice bricks present upon receipt? (Yes) No N/A
Random Sample Temperature on Receipt: 5.4 °C
Other comment: F6

SAMPLER: **SAMPLER MOBILE:** 0404542354
COC emailed to ALS? (YES / NO) **EDD FORMAT** (or default):
Email Reports to (will default to PM if no other addresses are listed):
Email Invoice to (will default to PM if no other addresses are listed):

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Rhys Holmewood	Kayley Wright	Kayley Wright	JESSIE
DATE/TIME: 26/8/09 4pm	DATE/TIME: Newcastle 26/8/09 4pm	DATE/TIME: Newcastle 26/8/09 5pm	DATE/TIME: 27-8-09 - 8:00am

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	TPH BTEX	PAHs	Metals S-2	OCPs	PCBs				Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
21	TP215.71 0.0M	26/8/09	S	250mL JAR	1									
(5)	TP215.71 0.5M					X	X	X	X					
22	TP215.71 1.0M													
23	TP215.71 1.5M													
(6)	TP215.62 0.0M					X	X	X	X					
24	TP215.62 0.5M													
25 ✱	TP215.62 1.0M	} 3 SAMPLES		NOT RECEIVED 26/8										
26 ✱	TP215.62 1.5M													
(7)	TP215.56 0.0M					X	X	X	X					
27	TP215.56 0.5M													
(8)	TP215.48 0.0M					X	X	X		X				
28	TP215.48 0.3M													
				TOTAL										

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

153811

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney**: 277 Woodpark Rd, Smithfield NSW 2164 Ph 02 8784 8555 E: samples.sydney@alsenviro.com

☐ **Newcastle**: 5 Rosegum Rd, Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com

☐ **Brisbane**: 32 Shand St, Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com

☐ **Townsville**: 14-15 Desma Ct, Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com

☐ **Melbourne**: 2-4 Westall Rd, Springvale, VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsenviro.com

☐ **Adelaide**: 2/1 Burma Rd, Pooraka SA 5095 Ph:08 8359 0890 E: adelaide@alsenviro.com

☐ **Perth**: 10 Hod Way, Malaga, WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com

☐ **Launceston**: 27 Wellington St, Launceston, TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT:	**TURNAROUND REQUIREMENTS:** (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
OFFICE:		
PROJECT:	**ALS QUOTE NO.:**	COC SEQUENCE NUMBER (Circle) COC: 1 2 (3) 4 5 6 7
PURCHASE ORDER NUMBER:		OF: 1 2 (3) 4 5 6 7
PROJECT MANAGER:	**CONTACT PH:**	
SAMPLER:	**SAMPLER MOBILE:** 0404542354	
COC emailed to ALS? (YES / NO)	**EDD FORMAT** (or default):	
Email Reports to (will default to PM if no other addresses are listed):		
Email Invoice to (will default to PM if no other addresses are listed):		

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: 5-6 °C
Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Rhys Holmewood	Hayley Wolfe	Hayley Wolfe	JESSIE
DATE/TIME: 26/8/09 4pm	DATE/TIME: 26/8/09 4pm	DATE/TIME: 26/8/09 5pm	DATE/TIME: 27-8-09 - 8:00 —

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	TPH BTEX	PAHs	Metals 5-2	OCPs	PCBs				Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
(9)	TP214.77 0.0M	26/8/09	S	250mL JAR	1			X	X					
29	TP214.77 0.5M													
(10)	TP214.70 0.0M							X	X					
30	TP214.70 0.5M													
(11)	TP214.66 0.0M							X	X					
31	TP214.66 0.3M													
(12)	TPQA01					X	X	X	X					
[illegible]	TPQA02					X*	X*	X*	X*					*FWD to Labmark
				TOTAL										

acknowledge by:
Jessie - 27-8-09

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.

153812

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **ES0912698**

Client	: **GHD SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR JESSE SIMKUS	Contact	: Charlie Pierce
Address	: PO BOX 5403 NEWCASTLE WEST NSW, AUSTRALIA 2302	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jesse.simkus@ghd.com.au	E-mail	: charlie.pierce@alsenviro.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 22 1454521	Page	: 1 of 2
Order number	: ----		
C-O-C number	: 135122	Quote number	: EM2009GHDSER0392 (EN/005/09)
Site	: ----		
Sampler	: JF	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 25-AUG-2009	Issue Date	: 26-AUG-2009 10:23
Client Requested Due Date	: 28-AUG-2009	Scheduled Reporting Date	: **31-AUG-2009**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 6.8'c - Ice present
No. of coolers/boxes	: 1 HARD	No. of samples received	: 24
Sercurity Seal	: Intact.	No. of samples analysed	: 19

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Please direct any queries related to sample condition / numbering / breakages to Jacob Waugh
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (90 days) from date of completion of work order.

Sample Container(s)/Preservation Non-Compliances

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

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process neccessary 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.
When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	(On Hold) SOIL No analysis requested	SOIL - EP068A (solids) Organochlorine Pesticides by GCMS	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-07 TPH/BTEX/PAH (SIM)
ES0912698-001	25-AUG-2009 15:00	SP-T 194.380			✓	✓
ES0912698-002	25-AUG-2009 15:00	SP-T 194.420			✓	✓
ES0912698-003	25-AUG-2009 15:00	SP-W196.100		✓	✓	✓
ES0912698-004	25-AUG-2009 15:00	SP-W196.140		✓	✓	✓
ES0912698-005	25-AUG-2009 15:00	SP-W196.240		✓	✓	✓
ES0912698-006	25-AUG-2009 15:00	SP-W B1		✓	✓	✓
ES0912698-007	25-AUG-2009 15:00	SP-W PG1		✓	✓	✓
ES0912698-008	25-AUG-2009 15:00	SP-W DG1		✓	✓	✓
ES0912698-009	25-AUG-2009 15:00	SP-W DB1		✓	✓	✓
ES0912698-010	25-AUG-2009 15:00	SP-W PB1		✓	✓	✓
ES0912698-011	25-AUG-2009 15:00	SP-W196.390		✓	✓	✓
ES0912698-012	25-AUG-2009 15:00	SP-W196.400		✓	✓	✓
ES0912698-013	25-AUG-2009 15:00	SP-W196.480		✓	✓	✓
ES0912698-014	25-AUG-2009 15:00	SL-B215.050		✓	✓	✓
ES0912698-015	25-AUG-2009 15:00	SL-B215.130		✓	✓	✓
ES0912698-016	25-AUG-2009 15:00	SL-B215.200		✓	✓	✓
ES0912698-017	25-AUG-2009 15:00	SP-T195.100			✓	✓
ES0912698-018	25-AUG-2009 15:00	SP-W-QA01		✓	✓	✓
ES0912698-019	25-AUG-2009 15:00	SL-B-QA02		✓	✓	✓
ES0912698-020	25-AUG-2009 15:00	SP-W B2	✓			
ES0912698-021	25-AUG-2009 15:00	SP-W PG2	✓			
ES0912698-022	25-AUG-2009 15:00	SP-W DG2	✓			
ES0912698-023	25-AUG-2009 15:00	SP-W DB2	✓			
ES0912698-024	25-AUG-2009 15:00	SP-W PB2	✓			

Requested Deliverables

MR JESSE SIMKUS

- *AU Certificate of Analysis - NATA (COA)	Email	jesse.simkus@ghd.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	jesse.simkus@ghd.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	jesse.simkus@ghd.com.au
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	jesse.simkus@ghd.com.au
- Default - Chain of Custody (COC)	Email	jesse.simkus@ghd.com.au
- EDI Format - ENMRG (ENMRG)	Email	jesse.simkus@ghd.com.au
- EDI Format - ESDAT (ESDAT)	Email	jesse.simkus@ghd.com.au
- EDI Format - GHDNEW (GHDNEW)	Email	jesse.simkus@ghd.com.au

MS MELISSA SIMPSON

- A4 - AU Tax Invoice (INV)	Email	Melissa.Simpson@ghd.com.au

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES0912698**	Page	: 1 of 8
Client	: GHD SERVICES PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: MR JESSE SIMKUS	Contact	: Charlie Pierce
Address	: PO BOX 5403 NEWCASTLE WEST NSW, AUSTRALIA 2302	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jesse.simkus@ghd.com.au	E-mail	: charlie.pierce@alsenviro.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 22 1454521	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: 135122	Date Samples Received	: 25-AUG-2009
Sampler	: JF	Issue Date	: 31-AUG-2009
Order number	: ----		
		No. of samples received	: 24
Quote number	: EN/005/09	No. of samples analysed	: 19

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non -volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

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							
Soil Glass Jar - Unpreserved							
SP-T 194.380, SP-T 194.420, SP-W196.100, SP-W196.140, SP-W196.240, SP-W B1, SP-W PG1, SP-W DG1, SP-W DB1, SP-W PB1, SP-W196.390, SP-W196.400, SP-W196.480, SL-B215.050, SL-B215.130, SL-B215.200, SP-T195.100, SP-W-QA01, SL-B-QA02	**25-AUG-2009**	**----**	----	----	**27-AUG-2009**	01-SEP-2009	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved							
SP-T 194.380, SP-T 194.420, SP-W196.100, SP-W196.140, SP-W196.240, SP-W B1, SP-W PG1, SP-W DG1, SP-W DB1, SP-W PB1, SP-W196.390, SP-W196.400, SP-W196.480, SL-B215.050, SL-B215.130, SL-B215.200, SP-T195.100, SP-W-QA01, SL-B-QA02	**25-AUG-2009**	**26-AUG-2009**	22-SEP-2009	✓	**27-AUG-2009**	21-FEB-2010	✓

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
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved								
SP-T 194.380,	SP-T 194.420,	**25-AUG-2009**	**26-AUG-2009**	22-SEP-2009	✓	**27-AUG-2009**	22-SEP-2009	✓
SP-W196.100,	SP-W196.140,							
SP-W196.240,	SP-W B1,							
SP-W PG1,	SP-W DG1,							
SP-W DB1,	SP-W PB1,							
SP-W196.390,	SP-W196.400,							
SP-W196.480,	SL-B215.050,							
SL-B215.130,	SL-B215.200,							
SP-T195.100,	SP-W-QA01,							
SL-B-QA02								
EP068A: Organochlorine Pesticides (OC)								
Soil Glass Jar - Unpreserved								
SP-W196.100,	SP-W196.140,	**25-AUG-2009**	**26-AUG-2009**	08-SEP-2009	✓	**27-AUG-2009**	05-OCT-2009	✓
SP-W196.240,	SP-W B1,							
SP-W PG1,	SP-W DG1,							
SP-W DB1,	SP-W PB1,							
SP-W196.390,	SP-W196.400,							
SP-W196.480,	SL-B215.050,							
SL-B215.130,	SL-B215.200,							
SP-W-QA01,	SL-B-QA02							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved								
SP-T 194.380,	SP-T 194.420,	**25-AUG-2009**	**26-AUG-2009**	08-SEP-2009	✓	**27-AUG-2009**	05-OCT-2009	✓
SP-W196.100,	SP-W196.140,							
SP-W196.240,	SP-W B1,							
SP-W PG1,	SP-W DG1,							
SP-W DB1,	SP-W PB1,							
SP-W196.390,	SP-W196.400,							
SP-W196.480,	SL-B215.050,							
SL-B215.130,	SL-B215.200,							
SP-T195.100,	SP-W-QA01,							
SL-B-QA02								

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
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved								
SP-T 194.380,	SP-T 194.420,	**25-AUG-2009**	**26-AUG-2009**	08-SEP-2009	✓	**27-AUG-2009**	05-OCT-2009	✓
SP-W196.100,	SP-W196.140,							
SP-W196.240,	SP-W B1,							
SP-W PG1,	SP-W DG1,							
SP-W DB1,	SP-W PB1,							
SP-W196.390,	SP-W196.400,							
SP-W196.480,	SL-B215.050,							
SL-B215.130,	SL-B215.200,							
SP-T195.100,	SP-W-QA01,							
SL-B-QA02								
Soil Glass Jar - Unpreserved								
SP-T 194.380,	SP-T 194.420,	**25-AUG-2009**	**26-AUG-2009**	08-SEP-2009	✓	**28-AUG-2009**	08-SEP-2009	✓
SP-W196.100,	SP-W196.140,							
SP-W196.240,	SP-W B1,							
SP-W PG1,	SP-W DG1,							
SP-W DB1,	SP-W PB1,							
SP-W196.390,	SP-W196.400,							
SP-W196.480,	SL-B215.050,							
SL-B215.130,	SL-B215.200,							
SP-T195.100,	SP-W-QA01,							
SL-B-QA02								
EP080: BTEX								
Soil Glass Jar - Unpreserved								
SP-T 194.380,	SP-T 194.420,	**25-AUG-2009**	**26-AUG-2009**	08-SEP-2009	✓	**28-AUG-2009**	08-SEP-2009	✓
SP-W196.100,	SP-W196.140,							
SP-W196.240,	SP-W B1,							
SP-W PG1,	SP-W DG1,							
SP-W DB1,	SP-W PB1,							
SP-W196.390,	SP-W196.400,							
SP-W196.480,	SL-B215.050,							
SL-B215.130,	SL-B215.200,							
SP-T195.100,	SP-W-QA01,							
SL-B-QA02								

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	4	40	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	19	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	4	34	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	4	34	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	19	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	19	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	34	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	34	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	34	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	34	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	19	**5.3**	**5.0**	✓	ALS QCS3 requirement
Pesticides by GCMS	EP068	1	16	**6.3**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	34	**5.9**	**5.0**	✓	ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	34	**5.9**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	**5.3**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	19	**5.3**	**5.0**	✓	ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (1999) Schedule B(3) (Method 102)
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) 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 (1999) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 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 (1999) Schedule B(3)
Pesticides by GCMS	EP068	SOIL	(USEPA SW 846 - 8270B) 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 (1999) Schedule B(3) (Method 504,505)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. 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 (1999) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option A - Concentrating)	ORG17A	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EP068A: Organochlorine Pesticides (OC)	1243630-002	----	**beta-BHC**	319-85-7	118 %	59.8-117%	**Recovery greater than upper control limit**
EP068A: Organochlorine Pesticides (OC)	1243630-002	----	**delta-BHC**	319-86-8	118 %	65.8-114%	**Recovery greater than upper control limit**
EP068A: Organochlorine Pesticides (OC)	1243630-002	----	**Aldrin**	309-00-2	116 %	67-113%	**Recovery greater than upper control limit**
EP068A: Organochlorine Pesticides (OC)	1243630-002	----	**Heptachlor epoxide**	1024-57-3	117 %	65.6-113%	**Recovery greater than upper control limit**
EP068A: Organochlorine Pesticides (OC)	1243630-002	----	**alpha-Endosulfan**	959-98-8	116 %	65.8-116%	**Recovery greater than upper control limit**
EP068A: Organochlorine Pesticides (OC)	1243630-002	----	**Dieldrin**	60-57-1	117 %	67.4-116%	**Recovery greater than upper control limit**
EP068A: Organochlorine Pesticides (OC)	1243630-002	----	**4.4`-DDE**	72-55-9	115 %	67.5-114%	**Recovery greater than upper control limit**
Matrix Spike (MS) Recoveries							
EP068A: Organochlorine Pesticides (OC)	ES0912698-003	SP-W196.100	**4.4`-DDT**	50-29-3	65.8 %	67.12-118.10 %	**Recovery less than lower data quality objective**
EP080/071: Total Petroleum Hydrocarbons	ES0912698-001	SP-T 194.380	**C6 - C9 Fraction**	----	69.7 %	70-130%	**Recovery less than lower data quality objective**

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**

Regular Sample Surrogates

Sub-Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP080S: TPH(V)/BTEX Surrogates	ES0912698-002	SP-T 194.420	**1.2-Dichloroethane-D4**	17060-07-0	124 %	80-120 %	**Recovery greater than upper data quality objective**
EP080S: TPH(V)/BTEX Surrogates	ES0912698-004	SP-W196.140	**1.2-Dichloroethane-D4**	17060-07-0	125 %	80-120 %	**Recovery greater than upper data quality objective**
EP080S: TPH(V)/BTEX Surrogates	ES0912698-002	SP-T 194.420	**Toluene-D8**	2037-26-5	123 %	81-117 %	**Recovery greater than upper data quality objective**

Sub-Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted - Continued							
EP080S: TPH(V)/BTEX Surrogates	ES0912698-006	SP-W B1	**Toluene-D8**	2037-26-5	120 %	81-117 %	**Recovery greater than upper data quality objective**
EP080S: TPH(V)/BTEX Surrogates	ES0912698-014	SL-B215.050	**Toluene-D8**	2037-26-5	120 %	81-117 %	**Recovery greater than upper data quality objective**
EP080S: TPH(V)/BTEX Surrogates	ES0912698-018	SP-W-QA01	**Toluene-D8**	2037-26-5	118 %	81-117 %	**Recovery greater than upper data quality objective**
EP080S: TPH(V)/BTEX Surrogates	ES0912698-011	SP-W196.390	**Toluene-D8**	2037-26-5	120 %	81-117 %	**Recovery greater than upper data quality objective**
EP080S: TPH(V)/BTEX Surrogates	ES0912698-002	SP-T 194.420	**4-Bromofluorobenzene**	460-00-4	127 %	74-121 %	**Recovery greater than upper data quality objective**
EP080S: TPH(V)/BTEX Surrogates	ES0912698-011	SP-W196.390	**4-Bromofluorobenzene**	460-00-4	127 %	74-121 %	**Recovery greater than upper data quality objective**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

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

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

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

QUALITY CONTROL REPORT

Work Order	: **ES0912698**	Page	: 1 of 10
Client	: **GHD SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR JESSE SIMKUS	Contact	: Charlie Pierce
Address	: PO BOX 5403 NEWCASTLE WEST NSW, AUSTRALIA 2302	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jesse.simkus@ghd.com.au	E-mail	: charlie.pierce@alsenviro.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 22 1454521	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: 135122	Date Samples Received	: 25-AUG-2009
Sampler	: JF	Issue Date	: 31-AUG-2009
Order number	: ----		
		No. of samples received	: 24
Quote number	: EN/005/09	No. of samples analysed	: 19

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

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

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Hoa Nguyen	Inorganic Chemist	Inorganics
Pabi Subba	Senior Organic Chemist (Semi-Volatile)	Organics
Wisam Abou-Maraseh	Spectroscopist	Inorganics

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 insuffient sample for analysis.

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

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

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 (QC Lot: 1081814)									
ES0912683-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	24.7	25.0	1.1	0% - 20%
ES0912698-008	SP-W DG1	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	1.6	1.8	7.8	No Limit
EA055: Moisture Content (QC Lot: 1081815)									
ES0912698-019	SL-B-QA02	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	4.9	4.8	0.0	No Limit
ES0912811-009	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	15.0	13.3	12.0	0% - 50%
EG005T: Total Metals by ICP-AES (QC Lot: 1080744)									
ES0912686-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	10	10	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	6	6	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	44	43	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	9	10	11.2	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	20	29	35.9	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	36	31	14.2	No Limit
ES0912686-011	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	10	9	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	2	2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	13	13	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	17	18	0.0	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 1080746)									
ES0912698-006	SP-W B1	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	12	16	28.7	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	10	14	35.2	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	14	16	12.2	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	22	28	22.1	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	22	25	15.1	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	69	83	17.4	0% - 50%
ES0912698-016	SL-B215.200	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	26	24	9.5	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	21	19	8.1	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	7	7	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	21	19	11.8	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	11	12	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	58	61	6.5	0% - 50%

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 (%)*
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1080745)									
ES0912686-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.1	<0.1	0.0	No Limit
ES0912686-011	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1080747)									
ES0912698-006	SP-W B1	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES0912698-016	SL-B215.200	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1080864)									
ES0912698-003	SP-W196.100	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
ES0912698-013	SP-W196.480	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1080864) - continued									
ES0912698-013	SP-W196.480	EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1080871)									
ES0912698-001	SP-T 194.380	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES0912698-012	SP-W196.400	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

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: 1080871) - continued									
ES0912698-012	SP-W196.400	EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1080749)									
ES0912698-001	SP-T 194.380	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES0912698-012	SP-W196.400	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1080870)									
ES0912698-001	SP-T 194.380	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES0912698-012	SP-W196.400	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEX (QC Lot: 1080749)									
ES0912698-001	SP-T 194.380	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES0912698-012	SP-W196.400	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method 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: 1080744)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.1 mg/kg	109	90.1	124
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.76 mg/kg	103	83.3	111
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.9 mg/kg	100	89.2	117
EG005T: Copper	7440-50-8	5	mg/kg	<5	54.7 mg/kg	99.0	90.1	114
EG005T: Lead	7439-92-1	5	mg/kg	<5	55.2 mg/kg	95.0	85.2	111
EG005T: Nickel	7440-02-0	2	mg/kg	<2	54.8 mg/kg	100	88.3	116
EG005T: Zinc	7440-66-6	5	mg/kg	<5	104 mg/kg	97.5	88.9	112
EG005T: Total Metals by ICP-AES (QCLot: 1080746)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.1 mg/kg	105	90.1	124
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.76 mg/kg	96.4	83.3	111
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.9 mg/kg	94.8	89.2	117
EG005T: Copper	7440-50-8	5	mg/kg	<5	54.7 mg/kg	94.0	90.1	114
EG005T: Lead	7439-92-1	5	mg/kg	<5	55.2 mg/kg	89.3	85.2	111
EG005T: Nickel	7440-02-0	2	mg/kg	<2	54.8 mg/kg	95.0	88.3	116
EG005T: Zinc	7440-66-6	5	mg/kg	<5	104 mg/kg	91.9	88.9	112
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1080745)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.4 mg/kg	77.1	67	118
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1080747)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.4 mg/kg	73.2	67	118
EP068A: Organochlorine Pesticides (OC) (QCLot: 1080864)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.25 mg/kg	112	60.8	116
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.25 mg/kg	104	59.4	115
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.25 mg/kg	# 118	59.8	117
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.25 mg/kg	114	59.8	118
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.25 mg/kg	# 118	65.8	114
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.25 mg/kg	114	65.6	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.25 mg/kg	# 116	67	113
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.25 mg/kg	# 117	65.6	113
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.25 mg/kg	92.2	60.7	113
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.25 mg/kg	# 116	65.8	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.25 mg/kg	114	57.3	120
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.25 mg/kg	# 117	67.4	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.25 mg/kg	# 115	67.5	114
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.25 mg/kg	74.9	63	121

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
EP068A: Organochlorine Pesticides (OC) (QCLot: 1080864) - continued								
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.25 mg/kg	112	66.1	117
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.25 mg/kg	113	65.3	116
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.25 mg/kg	112	57.3	115
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.25 mg/kg	118	63.6	119
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.25 mg/kg	114	58.4	127
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.25 mg/kg	111	63.6	117
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.25 mg/kg	90.2	50.4	132
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1080871)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	99.1	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	100	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	93.0	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	95.1	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	100	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	102	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	98.2	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	98.4	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	105	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	104	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	103	71.8	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	97.0	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	106	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	91.0	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	86.1	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	94.0	72.4	114
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1080749)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	98.6	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1080870)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	90.0	75.2	116
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	200 mg/kg	83.0	75.3	113
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	85.0	72.6	117
EP080: BTEX (QCLot: 1080749)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	101	67.5	125
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	92.9	69	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	100	65.3	126
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	105	66.5	124
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	110	66.7	123

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 1080744)							
ES0912686-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	91.2	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	95.5	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	94.3	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	98.5	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	95.7	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	93.1	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	92.0	70	130
EG005T: Total Metals by ICP-AES (QCLot: 1080746)							
ES0912698-006	SP-W B1	EG005T: Arsenic	7440-38-2	50 mg/kg	98.7	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	89.0	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	96.9	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	102	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	89.5	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	95.0	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	92.0	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1080745)							
ES0912686-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	81.5	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1080747)							
ES0912698-006	SP-W B1	EG035T: Mercury	7439-97-6	5 mg/kg	85.5	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 1080864)							
ES0912698-003	SP-W196.100	EP068: gamma-BHC	58-89-9	0.25 mg/kg	107	75.65	110.44
		EP068: Heptachlor	76-44-8	0.25 mg/kg	100	72.2	106.71
		EP068: Aldrin	309-00-2	0.25 mg/kg	102	77.54	107.0
		EP068: Dieldrin	60-57-1	0.25 mg/kg	108	76.37	109.7
		EP068: Endrin	72-20-8	1 mg/kg	117	68.51	119.47
		EP068: 4.4`-DDT	50-29-3	1 mg/kg	# 65.8	67.12	118.10
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1080871)							
ES0912698-001	SP-T 194.380	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	80.0	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	86.2	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1080749)							
ES0912698-001	SP-T 194.380	EP080: C6 - C9 Fraction	----	26 mg/kg	# 69.7	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1080870)							
ES0912698-001	SP-T 194.380	EP071: C10 - C14 Fraction	----	640 mg/kg	102	70	130
		EP071: C15 - C28 Fraction	----	3140 mg/kg	106	70	130

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: Spike Recovery (%) MS	Matrix Spike (MS) Report: Recovery Limits (%) Low	Matrix Spike (MS) Report: Recovery Limits (%) High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1080870) - continued							
ES0912698-001	SP-T 194.380	EP071: C29 - C36 Fraction	----	2860 mg/kg	95.3	70	130
EP080: BTEX (QCLot: 1080749)							
ES0912698-001	SP-T 194.380	EP080: Benzene	71-43-2	2.5 mg/kg	73.6	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	73.1	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	73.5	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	74.4	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	80.2	70	130

CERTIFICATE OF ANALYSIS

Work Order	: **ES0912698**	Page	: 1 of 15
Client	: **GHD SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR JESSE SIMKUS	Contact	: Charlie Pierce
Address	: PO BOX 5403 NEWCASTLE WEST NSW, AUSTRALIA 2302	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jesse.simkus@ghd.com.au	E-mail	: charlie.pierce@alsenviro.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 22 1454521	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: 135122	Date Samples Received	: 25-AUG-2009
Sampler	: JF	Issue Date	: 31-AUG-2009
Site	: ----		
		No. of samples received	: 24
Quote number	: EN/005/09	No. of samples analysed	: 19

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Hoa Nguyen	Inorganic Chemist	Inorganics
Pabi Subba	Senior Organic Chemist (Semi-Volatile)	Organics
Wisam Abou-Maraseh	Spectroscopist	Inorganics

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 insuffient 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 date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

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

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: SP-T 194.380	SP-T 194.420	SP-W196.100	SP-W196.140	SP-W196.240
				Client sampling date / time: 25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00
				ES0912698-001	ES0912698-002	ES0912698-003	ES0912698-004	ES0912698-005
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	**12.8**	**12.7**	**3.5**	**5.3**	**8.8**
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**9**	**10**	**57**	<5	**28**
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**24**	**24**	**33**	**13**	**27**
Copper	7440-50-8	5	mg/kg	**11**	**10**	**30**	**7**	**28**
Lead	7439-92-1	5	mg/kg	**10**	**11**	**35**	**9**	**30**
Nickel	7440-02-0	2	mg/kg	**30**	**25**	**16**	**14**	**17**
Zinc	7440-66-6	5	mg/kg	**41**	**42**	**85**	**37**	**69**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	**0.5**	**0.4**	<0.1	**0.5**	<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
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
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
Methoxychlor	72-43-5	0.2	mg/kg	----	----	<0.2	<0.2	<0.2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: SP-T 194.380	SP-T 194.420	SP-W196.100	SP-W196.140	SP-W196.240
				Client sampling date / time: 25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00
				ES0912698-001	ES0912698-002	ES0912698-003	ES0912698-004	ES0912698-005
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	----	----	**84.5**	**80.0**	**100**
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	----	----	**65.8**	**66.9**	**75.9**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**88.4**	**98.4**	**91.0**	**97.9**	**92.4**
2-Chlorophenol-D4	93951-73-6	0.1	%	**87.9**	**95.5**	**88.6**	**96.6**	**90.0**
2.4.6-Tribromophenol	118-79-6	0.1	%	**68.7**	**76.2**	**74.4**	**82.0**	**76.1**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**91.4**	**97.4**	**91.6**	**100**	**92.9**
Anthracene-d10	1719-06-8	0.1	%	**95.0**	**99.4**	**93.5**	**103**	**95.5**
4-Terphenyl-d14	1718-51-0	0.1	%	**101**	**104**	**99.1**	**108**	**100**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**112**	**124**	**116**	**125**	**104**

Analytical Results

Sub-Matrix: SOIL				Client sample ID	SP-T 194.380	SP-T 194.420	SP-W196.100	SP-W196.140	SP-W196.240
				Client sampling date / time	25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00
Compound	CAS Number	LOR	Unit		ES0912698-001	ES0912698-002	ES0912698-003	ES0912698-004	ES0912698-005
EP080S: TPH(V)/BTEX Surrogates - Continued									
Toluene-D8	2037-26-5	0.1	%		**94.6**	**123**	**99.1**	**101**	**96.4**
4-Bromofluorobenzene	460-00-4	0.1	%		**99.0**	**127**	**103**	**109**	**104**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: SP-W B1	SP-W PG1	SP-W DG1	SP-W DB1	SP-W PB1
				Client sampling date / time: 25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00
				ES0912698-006	ES0912698-007	ES0912698-008	ES0912698-009	ES0912698-010
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	**1.6**	**11.6**	**1.6**	**2.7**	**18.3**
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**14**	**8**	**13**	**76**	**6**
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**12**	**16**	**15**	**23**	**14**
Copper	7440-50-8	5	mg/kg	**22**	**13**	**18**	**30**	**9**
Lead	7439-92-1	5	mg/kg	**22**	**11**	**20**	**91**	**51**
Nickel	7440-02-0	2	mg/kg	**10**	**8**	**14**	**38**	**4**
Zinc	7440-66-6	5	mg/kg	**69**	**30**	**66**	**105**	**17**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: SP-W B1	SP-W PG1	SP-W DG1	SP-W DB1	SP-W PB1
				Client sampling date / time: 25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00
				ES0912698-006	ES0912698-007	ES0912698-008	ES0912698-009	ES0912698-010
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	**1.7**
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	**3.0**
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	**2.8**
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	**1.0**
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	**0.7**
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	**1.0**
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	**1.0**
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	**0.7**
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	**98.7**	**100**	**89.4**	**95.0**	**95.8**
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	**70.3**	**86.7**	**71.0**	**90.6**	**81.8**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**84.5**	**96.4**	**88.0**	**92.0**	**90.3**
2-Chlorophenol-D4	93951-73-6	0.1	%	**81.7**	**93.0**	**84.1**	**89.9**	**87.5**
2.4.6-Tribromophenol	118-79-6	0.1	%	**64.0**	**73.4**	**65.0**	**57.0**	**67.3**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**89.5**	**94.4**	**87.7**	**93.7**	**90.1**
Anthracene-d10	1719-06-8	0.1	%	**89.0**	**96.6**	**87.8**	**93.6**	**94.5**
4-Terphenyl-d14	1718-51-0	0.1	%	**93.4**	**99.9**	**91.2**	**97.2**	**96.7**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**118**	**95.4**	**116**	**101**	**80.8**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: SP-W B1	SP-W PG1	SP-W DG1	SP-W DB1	SP-W PB1
				Client sampling date / time: 25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00
				ES0912698-006	ES0912698-007	ES0912698-008	ES0912698-009	ES0912698-010
EP080S: TPH(V)/BTEX Surrogates - Continued								
Toluene-D8	2037-26-5	0.1	%	**120**	**98.3**	**113**	**105**	**95.4**
4-Bromofluorobenzene	460-00-4	0.1	%	**120**	**100**	**121**	**107**	**102**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID	SP-W196.390	SP-W196.400	SP-W196.480	SL-B215.050	SL-B215.130
				Client sampling date / time	25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00
					ES0912698-011	ES0912698-012	ES0912698-013	ES0912698-014	ES0912698-015
EA055: Moisture Content									
^ Moisture Content (dried @ 103°C)	----	1.0	%		**3.4**	**6.0**	**6.7**	**2.7**	**1.8**
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		**32**	**21**	**18**	**6**	**14**
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		**18**	**10**	**23**	**58**	**29**
Copper	7440-50-8	5	mg/kg		**12**	**16**	**35**	**12**	**18**
Lead	7439-92-1	5	mg/kg		**24**	**21**	**32**	**10**	**25**
Nickel	7440-02-0	2	mg/kg		<2	**8**	**22**	**18**	**14**
Zinc	7440-66-6	5	mg/kg		**25**	**48**	**99**	**64**	**64**
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		**0.1**	<0.1	**0.1**	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: SP-W196.390	SP-W196.400	SP-W196.480	SL-B215.050	SL-B215.130
				Client sampling date / time: 25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00
				ES0912698-011	ES0912698-012	ES0912698-013	ES0912698-014	ES0912698-015
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	**88.0**	**79.2**	**102**	**102**	**97.1**
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	**65.5**	**71.9**	**75.6**	**85.6**	**89.5**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**90.8**	**102**	**90.3**	**90.9**	**89.3**
2-Chlorophenol-D4	93951-73-6	0.1	%	**88.4**	**97.4**	**88.4**	**89.4**	**88.1**
2.4.6-Tribromophenol	118-79-6	0.1	%	**70.7**	**86.3**	**75.9**	**71.5**	**71.2**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**90.0**	**100**	**93.5**	**91.7**	**92.3**
Anthracene-d10	1719-06-8	0.1	%	**92.0**	**103**	**96.0**	**94.2**	**95.3**
4-Terphenyl-d14	1718-51-0	0.1	%	**94.0**	**107**	**100**	**97.6**	**100**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**99.2**	**99.7**	**84.6**	**109**	**85.4**

Analytical Results

Sub-Matrix: SOIL				Client sample ID	SP-W196.390	SP-W196.400	SP-W196.480	SL-B215.050	SL-B215.130
				Client sampling date / time	25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00
Compound	CAS Number	LOR	Unit		ES0912698-011	ES0912698-012	ES0912698-013	ES0912698-014	ES0912698-015
EP080S: TPH(V)/BTEX Surrogates - Continued									
Toluene-D8	2037-26-5	0.1	%		**120**	**111**	**97.6**	**120**	**95.0**
4-Bromofluorobenzene	460-00-4	0.1	%		**127**	**120**	**107**	**109**	**85.0**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: SL-B215.200	SP-T195.100	SP-W-QA01	SL-B-QA02	----
				Client sampling date / time: 25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00	----
				ES0912698-016	ES0912698-017	ES0912698-018	ES0912698-019	----
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	**5.1**	**7.2**	**4.3**	**4.9**	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**7**	<5	**44**	**8**	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	----
Chromium	7440-47-3	2	mg/kg	**26**	**23**	**24**	**23**	----
Copper	7440-50-8	5	mg/kg	**21**	**13**	**22**	**18**	----
Lead	7439-92-1	5	mg/kg	**11**	<5	**26**	**12**	----
Nickel	7440-02-0	2	mg/kg	**21**	**92**	**14**	**20**	----
Zinc	7440-66-6	5	mg/kg	**58**	**51**	**66**	**54**	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<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	----
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	----
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	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	----	<0.2	<0.2	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: SL-B215.200	SP-T195.100	SP-W-QA01	SL-B-QA02	----
				Client sampling date / time: 25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00	----
				ES0912698-016	ES0912698-017	ES0912698-018	ES0912698-019	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	**103**	----	**80.6**	**86.7**	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	**71.1**	----	**71.1**	**72.3**	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**99.5**	**97.8**	**87.1**	**88.9**	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**95.1**	**95.5**	**85.4**	**86.9**	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**54.7**	**85.6**	**72.7**	**68.2**	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**95.9**	**100**	**89.9**	**89.0**	----
Anthracene-d10	1719-06-8	0.1	%	**98.0**	**102**	**90.8**	**89.6**	----
4-Terphenyl-d14	1718-51-0	0.1	%	**103**	**108**	**95.8**	**93.6**	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**106**	**90.6**	**115**	**92.4**	----

Analytical Results

Sub-Matrix: SOIL			Client sample ID	SL-B215.200	SP-T195.100	SP-W-QA01	SL-B-QA02	----
			Client sampling date / time	25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00	25-AUG-2009 15:00	----
Compound	CAS Number	LOR	Unit	ES0912698-016	ES0912698-017	ES0912698-018	ES0912698-019	----
EP080S: TPH(V)/BTEX Surrogates - Continued								
Toluene-D8	2037-26-5	0.1	%	**114**	**95.2**	**118**	**95.8**	----
4-Bromofluorobenzene	460-00-4	0.1	%	**101**	**85.8**	**102**	**85.7**	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	10	136
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	10	136
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	24	113
2-Chlorophenol-D4	93951-73-6	23	134
2.4.6-Tribromophenol	118-79-6	19	122
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	30	115
Anthracene-d10	1719-06-8	27	133
4-Terphenyl-d14	1718-51-0	18	137
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

CHAIN OF CUSTODY DOCUMENTATION

135122

ALS Laboratory Group

CLIENT: GHD NEWCASTLE	SAMPLER: Julian Fowler
ADDRESS / OFFICE: 24 HONEYSUCKLE DRIVE	MOBILE: 0423 163 493
PROJECT MANAGER (PM):	PHONE 49 799910
PROJECT ID: 22 1454521	EMAIL REPORT TO: Jesse.Simkus@ghd.com
SITE: P.O. NO.:	EMAIL INVOICE TO: (if different to report) melissa.simpson@ghd.com
RESULTS REQUIRED (Date): 3 DAY T.O QUOTE NO.:	

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No N/A
SAMPLE TEMPERATURE
CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

Notes: e.g. Highly contaminated samples
e.g. "High PAHs expected".
Extra volume for QC or trace LORs etc.

SAMPLE INFORMATION (note: S = Soil, W=Water)					CONTAINER INFORMATION		TPH/BTEX	PAH	52 metals	OCP's									
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles													
1	SP-T194.380	S	25/8				X	X	X										
2	SP-T194.420						X	X	X										
3	SP-W196.100						X	X	X	X									
4	SP-W196.140						X	X	X	X									
5	SP-W196.240						X	X	X	X									
6	SP-W B1						X	X	X	X									
21	SP-W B2																		
7	SP-W PG1						X	X	X	X									
8	SP-W PG2																		
9	SP-W DG1						X	X	X	X									
22	SP-W DG2																		
10	SP-W DB1	V	V				X	X	X	X									

Environmental Division
Sydney
Work Order
ES0912698

Telephone : +61-2-8784 8555

RELINQUISHED BY:			RECEIVED BY			METHOD OF SHIPMENT
Name: Julian Fowler	Date: 25/08/09		Name: Hayley Webb	Date: 25/8/09		Con' Note No:
Of: GHD	Time:		Of: ALS Newcastle	Time: 5:00		
Name: Hayley Webb	Date: 25/8/09		Name: FAST	Date: 26/8/09		Transport Co:
Of: ALS Newcastle	Time: 4pm		Of: ALS	Time: 8:30		

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserveed Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY DOCUMENTATION

135123

ALS Laboratory Group

CLIENT:	GHD NEWCASTLE
ADDRESS / OFFICE:	24 HONEYSUCKLE DRIVE
PROJECT MANAGER (PM):	
PROJECT ID:	22145521
SITE:	P.O. NO.:
RESULTS REQUIRED (Date):	3 DAY T.O QUOTE NO.:

SAMPLER:	Julian Fowler
MOBILE:	0423 163 493
PHONE	49 799910
EMAIL REPORT TO:	Jesse.Simkus@ghd.com
EMAIL INVOICE TO: (if different to report)	melissa.simpson@ghd.com

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No N/A
SAMPLE TEMPERATURE
CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DIPOSAL:

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

Notes: e.g. Highly contaminated samples
e.g. "High PAHs expected".
Extra volume for QC or trace LORs etc.

SAMPLE INFORMATION (note: S = Soil, W=Water)					CONTAINER INFORMATION		TPH / BTEX	PAH	S2 metals	OCP 4									
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles													
23	SP-WDB2	S	25/8																
11	SP-W PB1						X	X	X	X									
24	SP-W PB2																		
12	SP-W 196.390						X	X	X	X									
13	SP-W 196.400						X	X	X	X									
14	SP-W 196.480						X	X	X	X									
15	SL-B 215-050						X	X	X	X									
16	SL-B 215-130						X	X	X	X									
17	SL-B 215-200						X	X	X	X									
18	SP-T 195.100	↓	↓				X	X	X	X									
19	SP-W-QA01						X	X	X	X									
20	SL-B-QA02	↓	↓				X	X	X	X									

RELINQUISHED BY:		RECEIVED BY		METHOD OF SHIPMENT
Name: Julian Fowler	Date: 25/08/09	Name: Hayley Wright	Date: 25/8/09	Con' Note No:
Of: GHD	Time:	Of: GHD Newcastle	Time: 18:00	
Name: Hayley Wright	Date: 28/8/09	Name:	Date:	Transport Co:
Of: GHD Newcastle	Time: 9pm	Of:	Time:	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserveed Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

ALS Laboratory Group

WHITE - LAB COPY
YELLOW - CUSTOMER COPY
PINK - BOOK COPY

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **ES0912618**

Client	: **GHD SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR JESSE SIMKUS	Contact	: Charlie Pierce
Address	: PO BOX 5403 NEWCASTLE WEST NSW, AUSTRALIA 2302	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jesse.simkus@ghd.com.au	E-mail	: charlie.pierce@alsenviro.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 2214471	Page	: 1 of 3
Order number	: ----		
C-O-C number	: 135119-21	Quote number	: EM2009GHDSER0392 (EN/005/09)
Site	: ----		
Sampler	: JP	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 24-AUG-2009	Issue Date	: 25-AUG-2009 14:48
Client Requested Due Date	: 27-AUG-2009	Scheduled Reporting Date	: **27-AUG-2009**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 7.1'C - Ice present
No. of coolers/boxes	: 1 HARD	No. of samples received	: 38
Sercurity Seal	: Intact.	No. of samples analysed	: 10

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **sample id Composite 4 sent to Labmark as per COC**
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Please direct any queries related to sample condition / numbering / breakages to Jacob Waugh
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (90 days) from date of completion of work order.

Sample Container(s)/Preservation Non-Compliances

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

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process neccessary 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.
When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	(On Hold) SOIL No analysis requested	SOIL - EP068A (solids) Organochlorine Pesticides by GCMS	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-07 TPH/BTEX/PAH (SIM)
ES0912618-001	24-AUG-2009 15:00	COMPOSITE 1		✓	✓	
ES0912618-002	24-AUG-2009 15:00	COMPOSITE2		✓	✓	
ES0912618-003	24-AUG-2009 15:00	COMPOSITE 3		✓	✓	
ES0912618-004	24-AUG-2009 15:00	SLTP 011-0.0		✓	✓	✓
ES0912618-005	24-AUG-2009 15:00	SLTP 009-0.0		✓	✓	✓
ES0912618-006	24-AUG-2009 15:00	SLTP 008-0.3		✓	✓	✓
ES0912618-007	24-AUG-2009 15:00	SLTP 012-0.0		✓	✓	✓
ES0912618-008	24-AUG-2009 15:00	SLTP 010-0.0		✓	✓	✓
ES0912618-009	24-AUG-2009 15:00	SLTP 011-QA01		✓	✓	✓
ES0912618-010	24-AUG-2009 15:00	SLTP 008-QA02		✓	✓	✓
ES0912618-011	24-AUG-2009 15:00	SLTP 011-0.5	✓			
ES0912618-012	24-AUG-2009 15:00	SLTP 011-0.6	✓			
ES0912618-013	24-AUG-2009 15:00	SLTP 009-0.3	✓			
ES0912618-014	24-AUG-2009 15:00	SLTP 008-0.0	✓			
ES0912618-015	24-AUG-2009 15:00	SLTP 008-1.0	✓			
ES0912618-016	24-AUG-2009 15:00	SLTP 012-0.4	✓			
ES0912618-017	24-AUG-2009 15:00	SLTP 010-0.4	✓			
ES0912618-018	24-AUG-2009 15:00	SLTP 007-0.05	✓			
ES0912618-019	24-AUG-2009 15:00	SLTP 007-0.2	✓			
ES0912618-020	24-AUG-2009 15:00	SLTP 013-0.0	✓			
ES0912618-021	24-AUG-2009 15:00	SLTP 013-0.2	✓			
ES0912618-022	24-AUG-2009 15:00	SLTP 006-0.0	✓			
ES0912618-023	24-AUG-2009 15:00	SLTP 006-0.2	✓			
ES0912618-024	24-AUG-2009 15:00	SLTP 003-0.0	✓			
ES0912618-025	24-AUG-2009 15:00	SLTP 003-0.2	✓			
ES0912618-026	24-AUG-2009 15:00	SLTP 002-0.0	✓			
ES0912618-027	24-AUG-2009 15:00	SLTP 002-0.2	✓			
ES0912618-028	24-AUG-2009 15:00	SLTP 005-0.0	✓			
ES0912618-029	24-AUG-2009 15:00	SLTP 005-0.5	✓			
ES0912618-030	24-AUG-2009 15:00	SLTP 005-QA03	✓			
ES0912618-031	24-AUG-2009 15:00	SLTP 004-0.0	✓			
ES0912618-032	24-AUG-2009 15:00	SLTP 004-0.2	✓			
ES0912618-033	24-AUG-2009 15:00	SLTP 004-QA04	✓			
ES0912618-034	24-AUG-2009 15:00	SLTP 004-QA05	✓			
ES0912618-035	24-AUG-2009 15:00	SLTP 001-0.0	✓			

			(On Hold) SOIL No analysis requested	SOIL - EP068A (solids) Organochlorine Pesticides by GCMS	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-07 TPH/BTEX/PAH (SIM)
ES0912618-036	24-AUG-2009 15:00	SLTP 001-0.2	✓			
ES0912618-037	24-AUG-2009 15:00	SLTP 001-QA06	✓			
ES0912618-038	24-AUG-2009 15:00	SLTP 001-QA07	✓			

Requested Deliverables

MR JESSE SIMKUS

- *AU Certificate of Analysis - NATA (COA)	Email	jesse.simkus@ghd.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	jesse.simkus@ghd.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	jesse.simkus@ghd.com.au
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	jesse.simkus@ghd.com.au
- Default - Chain of Custody (COC)	Email	jesse.simkus@ghd.com.au
- EDI Format - ENMRG (ENMRG)	Email	jesse.simkus@ghd.com.au
- EDI Format - ESDAT (ESDAT)	Email	jesse.simkus@ghd.com.au
- EDI Format - GHDNEW (GHDNEW)	Email	jesse.simkus@ghd.com.au

MR JULIAN FOWLER

- *AU Certificate of Analysis - NATA (COA)	Email	julian.fowler@ghd.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	julian.fowler@ghd.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	julian.fowler@ghd.com.au
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	julian.fowler@ghd.com.au
- Default - Chain of Custody (COC)	Email	julian.fowler@ghd.com.au
- EDI Format - ENMRG (ENMRG)	Email	julian.fowler@ghd.com.au
- EDI Format - ESDAT (ESDAT)	Email	julian.fowler@ghd.com.au
- EDI Format - GHDNEW (GHDNEW)	Email	julian.fowler@ghd.com.au

MS MELISSA SIMPSON

- A4 - AU Tax Invoice (INV)	Email	Melissa.Simpson@ghd.com.au

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES0912618**	Page	: 1 of 7
Client	: GHD SERVICES PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: MR JESSE SIMKUS	Contact	: Charlie Pierce
Address	: PO BOX 5403 NEWCASTLE WEST NSW, AUSTRALIA 2302	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jesse.simkus@ghd.com.au	E-mail	: charlie.pierce@alsenviro.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 2214471	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: 135119-21	Date Samples Received	: 24-AUG-2009
Sampler	: JP	Issue Date	: 27-AUG-2009
Order number	: ----		
		No. of samples received	: 38
Quote number	: EN/005/09	No. of samples analysed	: 10

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non -volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

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								
Soil Glass Jar - Unpreserved								
COMPOSITE 1,	COMPOSITE2,	**24-AUG-2009**	**----**	----	----	**25-AUG-2009**	31-AUG-2009	✓
COMPOSITE 3,	SLTP 011-0.0,							
SLTP 009-0.0,	SLTP 008-0.3,							
SLTP 012-0.0,	SLTP 010-0.0,							
SLTP 011-QA01,	SLTP 008-QA02							
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved								
COMPOSITE 1,	COMPOSITE2,	**24-AUG-2009**	**25-AUG-2009**	21-SEP-2009	✓	**26-AUG-2009**	20-FEB-2010	✓
COMPOSITE 3,	SLTP 011-0.0,							
SLTP 009-0.0,	SLTP 008-0.3,							
SLTP 012-0.0,	SLTP 010-0.0,							
SLTP 011-QA01,	SLTP 008-QA02							
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved								
COMPOSITE 1,	COMPOSITE2,	**24-AUG-2009**	**25-AUG-2009**	21-SEP-2009	✓	**26-AUG-2009**	21-SEP-2009	✓
COMPOSITE 3,	SLTP 011-0.0,							
SLTP 009-0.0,	SLTP 008-0.3,							
SLTP 012-0.0,	SLTP 010-0.0,							
SLTP 011-QA01,	SLTP 008-QA02							
EP068A: Organochlorine Pesticides (OC)								
Soil Glass Jar - Unpreserved								
COMPOSITE 1,	COMPOSITE2,	**24-AUG-2009**	**25-AUG-2009**	07-SEP-2009	✓	**26-AUG-2009**	04-OCT-2009	✓
COMPOSITE 3,	SLTP 011-0.0,							
SLTP 009-0.0,	SLTP 008-0.3,							
SLTP 012-0.0,	SLTP 010-0.0,							
SLTP 011-QA01,	SLTP 008-QA02							

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
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved								
SLTP 011-0.0,	SLTP 009-0.0,	**24-AUG-2009**	**25-AUG-2009**	07-SEP-2009	✓	**26-AUG-2009**	04-OCT-2009	✓
SLTP 008-0.3,	SLTP 012-0.0,							
SLTP 010-0.0,	SLTP 011-QA01,							
SLTP 008-QA02								
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved								
SLTP 011-0.0,	SLTP 009-0.0,	**24-AUG-2009**	**25-AUG-2009**	07-SEP-2009	✓	**26-AUG-2009**	04-OCT-2009	✓
SLTP 008-0.3,	SLTP 012-0.0,							
SLTP 010-0.0,	SLTP 011-QA01,							
SLTP 008-QA02								
EP080: BTEX								
Soil Glass Jar - Unpreserved								
SLTP 011-0.0,	SLTP 009-0.0,	**24-AUG-2009**	**25-AUG-2009**	07-SEP-2009	✓	**26-AUG-2009**	07-SEP-2009	✓
SLTP 008-0.3,	SLTP 012-0.0,							
SLTP 010-0.0,	SLTP 011-QA01,							
SLTP 008-QA02								

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	3	24	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	3	28	**10.7**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	3	28	**10.7**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	18	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	3	25	**12.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	9	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	2	24	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	2	28	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	28	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	25	**8.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	2	24	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	2	28	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	28	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	25	**8.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	2	24	**8.3**	**5.0**	✓	ALS QCS3 requirement
Pesticides by GCMS	EP068	2	28	**7.1**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	28	**7.1**	**5.0**	✓	ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	18	**5.6**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	25	**8.0**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	9	**11.1**	**5.0**	✓	ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (1999) Schedule B(3) (Method 102)
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) 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 (1999) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 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 (1999) Schedule B(3)
Pesticides by GCMS	EP068	SOIL	(USEPA SW 846 - 8270B) 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 (1999) Schedule B(3) (Method 504,505)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Sample Compositing	* EN020	SOIL	Equal weights of each original soil are taken, then mixed and homogenised. The combined mixture is labelled as a new sample.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. 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 (1999) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option A - Concentrating)	ORG17A	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EG005T: Total Metals by ICP-AES	ES0912618-006	SLTP 008-0.3	**Zinc**	7440-66-6	35.8 %	0-20%	**RPD exceeds LOR based limits**
Laboratory Control Spike (LCS) Recoveries							
EP068A: Organochlorine Pesticides (OC)	1241982-002	----	**trans-Chlordane**	5103-74-2	116 %	60.7-113%	**Recovery greater than upper control limit**
EP068A: Organochlorine Pesticides (OC)	1242268-002	----	**trans-Chlordane**	5103-74-2	120 %	60.7-113%	**Recovery greater than upper control limit**
EP068A: Organochlorine Pesticides (OC)	1242268-002	----	**Endrin ketone**	53494-70-5	117 %	63.6-117%	**Recovery greater than upper control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1241979-008	----	**Naphthalene**	91-20-3	74.3 %	81.9-113%	**Recovery less than lower control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1241979-008	----	**Acenaphthene**	83-32-9	80.8 %	81.5-112%	**Recovery less than lower control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1241979-008	----	**Phenanthrene**	85-01-8	77.5 %	79.4-114%	**Recovery less than lower control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1241979-008	----	**Fluoranthene**	206-44-0	74.7 %	78.8-113%	**Recovery less than lower control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1241979-008	----	**Pyrene**	129-00-0	75.9 %	78.9-113%	**Recovery less than lower control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1241979-008	----	**Chrysene**	218-01-9	77.7 %	79.8-114%	**Recovery less than lower control limit**
Matrix Spike (MS) Recoveries							
EP068A: Organochlorine Pesticides (OC)	ES0912617-003	Anonymous	**Heptachlor**	76-44-8	67.9 %	72.2-106.71 %	**Recovery less than lower data quality objective**

- **For all matrices, no Method Blank value outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

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

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

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

QUALITY CONTROL REPORT

Work Order	: **ES0912618**	Page	: 1 of 12
Client	: **GHD SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR JESSE SIMKUS	Contact	: Charlie Pierce
Address	: PO BOX 5403 NEWCASTLE WEST NSW, AUSTRALIA 2302	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jesse.simkus@ghd.com.au	E-mail	: charlie.pierce@alsenviro.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 2214471	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: 135119-21	Date Samples Received	: 24-AUG-2009
Sampler	: JP	Issue Date	: 27-AUG-2009
Order number	: ----		
		No. of samples received	: 38
Quote number	: EN/005/09	No. of samples analysed	: 10

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

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

NATA Accredited Laboratory 825

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Signatories

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

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Spectroscopist	Inorganics
Edwandy Fadjar	Senior Organic Chemist	Organics
Hoa Nguyen	Inorganic Chemist	Inorganics

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 insuffient sample for analysis.

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

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

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 (QC Lot: 1079398)									
ES0912617-013	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	11.7	11.9	2.2	0% - 50%
ES0912618-005	SLTP 009-0.0	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	13.6	12.7	6.4	0% - 50%
EG005T: Total Metals by ICP-AES (QC Lot: 1079158)									
ES0912617-013	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	19	18	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	10	9	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	16	14	10.4	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	20	20	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	19	18	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	50	50	0.0	0% - 50%
ES0912618-006	SLTP 008-0.3	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	19	23	19.2	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	12	14	15.2	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	7	10	28.5	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	26	35	30.3	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	20	35	52.7	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	75	107	# 35.8	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1079157)									
ES0912617-003	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.2	0.3	0.0	No Limit
ES0912617-013	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.2	<0.1	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1079159)									
ES0912618-006	SLTP 008-0.3	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1079322)									
ES0912617-003	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1079322) - continued									
ES0912617-003	Anonymous	EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
ES0912617-016	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1079570)									
ES0912674-003	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1079570) - continued									
ES0912674-003	Anonymous	EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1079320)									
ES0912617-003	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	0.7	0.6	16.6	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	1.7	1.5	11.6	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	1.8	1.5	17.4	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	0.7	0.8	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	0.7	0.6	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	0.9	1.2	24.7	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	0.8	0.7	17.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	0.6	0.5	0.0	No Limit
ES0912617-013	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

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: 1079320) - continued									
ES0912617-013	Anonymous	EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1079560)									
ES0912618-009	SLTP 011-QA01	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1079175)									
ES0912618-004	SLTP 011-0.0	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1079319)									
ES0912617-003	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	140	140	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	120	100	10.8	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES0912617-013	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1079559)									
ES0912618-009	SLTP 011-QA01	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEX (QC Lot: 1079175)									
ES0912618-004	SLTP 011-0.0	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEX (QC Lot: 1079175) - continued									
ES0912618-004	SLTP 011-0.0	EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method 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: 1079158)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.1 mg/kg	109	90.1	124
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.76 mg/kg	102	83.3	111
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.9 mg/kg	104	89.2	117
EG005T: Copper	7440-50-8	5	mg/kg	<5	54.7 mg/kg	100	90.1	114
EG005T: Lead	7439-92-1	5	mg/kg	<5	55.2 mg/kg	97.4	85.2	111
EG005T: Nickel	7440-02-0	2	mg/kg	<2	54.8 mg/kg	103	88.3	116
EG005T: Zinc	7440-66-6	5	mg/kg	<5	104 mg/kg	97.6	88.9	112
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1079157)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.4 mg/kg	80.8	67	118
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1079159)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.4 mg/kg	84.0	67	118
EP068A: Organochlorine Pesticides (OC) (QCLot: 1079322)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.25 mg/kg	96.4	60.8	116
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.25 mg/kg	89.6	59.4	115
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.25 mg/kg	102	59.8	117
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.25 mg/kg	97.8	59.8	118
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.25 mg/kg	104	65.8	114
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.25 mg/kg	94.2	65.6	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.25 mg/kg	100	67	113
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.25 mg/kg	104	65.6	113
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.25 mg/kg	# 116	60.7	113
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.25 mg/kg	102	65.8	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.25 mg/kg	96.7	57.3	120
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.25 mg/kg	106	67.4	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.25 mg/kg	106	67.5	114
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.25 mg/kg	90.6	63	121
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.25 mg/kg	111	66.1	117
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.25 mg/kg	112	65.3	116
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.25 mg/kg	83.5	57.3	115
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.25 mg/kg	98.4	63.6	119
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.25 mg/kg	90.0	58.4	127
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.25 mg/kg	110	63.6	117
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.25 mg/kg	84.4	50.4	132
EP068A: Organochlorine Pesticides (OC) (QCLot: 1079570)								

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
EP068A: Organochlorine Pesticides (OC) (QCLot: 1079570) - continued								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.25 mg/kg	102	60.8	116
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.25 mg/kg	94.6	59.4	115
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.25 mg/kg	103	59.8	117
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.25 mg/kg	103	59.8	118
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.25 mg/kg	104	65.8	114
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.25 mg/kg	101	65.6	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.25 mg/kg	104	67	113
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.25 mg/kg	105	65.6	113
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.25 mg/kg	# 120	60.7	113
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.25 mg/kg	102	65.8	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.25 mg/kg	96.1	57.3	120
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.25 mg/kg	105	67.4	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.25 mg/kg	103	67.5	114
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.25 mg/kg	89.7	63	121
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.25 mg/kg	106	66.1	117
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.25 mg/kg	102	65.3	116
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.25 mg/kg	83.5	57.3	115
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.25 mg/kg	107	63.6	119
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.25 mg/kg	82.6	58.4	127
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.25 mg/kg	# 117	63.6	117
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.25 mg/kg	95.7	50.4	132
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1079320)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	# 74.3	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	88.4	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	# 80.8	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	86.5	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	# 77.5	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	83.2	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	# 74.7	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	# 75.9	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	79.2	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	# 77.7	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	73.7	71.8	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	76.8	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	86.5	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	82.5	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	81.6	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	78.0	72.4	114
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1079560)								

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: 1079560) - continued								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	90.2	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	91.4	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	92.1	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	90.3	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	89.5	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	91.7	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	92.5	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	93.9	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	85.0	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	86.2	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	82.2	71.8	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	88.6	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	86.9	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	90.4	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	91.1	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	88.7	72.4	114
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1079175)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	93.3	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1079319)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	111	75.2	116
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	200 mg/kg	99.0	75.3	113
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	108	72.6	117
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1079559)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	83.0	75.2	116
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	200 mg/kg	93.0	75.3	113
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	91.0	72.6	117
EP080: BTEX (QCLot: 1079175)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	73.4	67.5	125
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	83.4	69	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	82.3	65.3	126
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	80.0	66.5	124
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	88.4	66.7	123

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 1079158)							
ES0912617-013	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	90.5	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	95.6	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	90.9	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	103	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	92.0	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	95.6	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	99.7	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1079157)							
ES0912617-003	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	86.9	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1079159)							
ES0912617-013	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	86.1	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 1079322)							
ES0912617-003	Anonymous	EP068: gamma-BHC	58-89-9	0.25 mg/kg	84.2	75.65	110.44
		EP068: Heptachlor	76-44-8	0.25 mg/kg	# 67.9	72.2	106.71
		EP068: Aldrin	309-00-2	0.25 mg/kg	99.5	77.54	107.0
		EP068: Dieldrin	60-57-1	0.25 mg/kg	105	76.37	109.7
		EP068: Endrin	72-20-8	1 mg/kg	115	68.51	119.47
		EP068: 4.4`-DDT	50-29-3	1 mg/kg	84.3	67.12	118.10
EP068A: Organochlorine Pesticides (OC) (QCLot: 1079570)							
ES0912674-003	Anonymous	EP068: gamma-BHC	58-89-9	0.25 mg/kg	92.9	75.65	110.44
		EP068: Heptachlor	76-44-8	0.25 mg/kg	89.6	72.2	106.71
		EP068: Aldrin	309-00-2	0.25 mg/kg	89.6	77.54	107.0
		EP068: Dieldrin	60-57-1	0.25 mg/kg	90.6	76.37	109.7
		EP068: Endrin	72-20-8	1 mg/kg	74.0	68.51	119.47
		EP068: 4.4`-DDT	50-29-3	1 mg/kg	81.1	67.12	118.10
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1079320)							
ES0912617-003	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	97.5	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	102	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1079560)							
ES0912618-009	SLTP 011-QA01	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	82.2	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	77.4	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1079175)							
ES0912618-004	SLTP 011-0.0	EP080: C6 - C9 Fraction	----	26 mg/kg	105	70	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1079319)							
ES0912617-003	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	100	70	130
		EP071: C15 - C28 Fraction	----	3140 mg/kg	105	70	130
		EP071: C29 - C36 Fraction	----	2860 mg/kg	104	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1079559)							
ES0912618-009	SLTP 011-QA01	EP071: C10 - C14 Fraction	----	640 mg/kg	86.9	70	130
		EP071: C15 - C28 Fraction	----	3140 mg/kg	89.5	70	130
		EP071: C29 - C36 Fraction	----	2860 mg/kg	90.5	70	130
EP080: BTEX (QCLot: 1079175)							
ES0912618-004	SLTP 011-0.0	EP080: Benzene	71-43-2	2.5 mg/kg	74.2	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	84.9	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	81.6	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	79.1	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	81.1	70	130

CERTIFICATE OF ANALYSIS

Work Order	: **ES0912618**	Page	: 1 of 9
Client	: **GHD SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR JESSE SIMKUS	Contact	: Charlie Pierce
Address	: PO BOX 5403 NEWCASTLE WEST NSW, AUSTRALIA 2302	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jesse.simkus@ghd.com.au	E-mail	: charlie.pierce@alsenviro.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 2214471	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: 135119-21	Date Samples Received	: 24-AUG-2009
Sampler	: JP	Issue Date	: 27-AUG-2009
Site	: ----		
		No. of samples received	: 38
Quote number	: EN/005/09	No. of samples analysed	: 10

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Spectroscopist	Inorganics
Edwandy Fadjar	Senior Organic Chemist	Organics
Hoa Nguyen	Inorganic Chemist	Inorganics

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 insuffient 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 date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

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

- **EG005T: Poor precision was obtained for Zinc on sample ES0912618#6 due to sample heterogeneity.**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: COMPOSITE 1	COMPOSITE2	COMPOSITE 3	SLTP 011-0.0	SLTP 009-0.0
				Client sampling date / time: 24-AUG-2009 15:00	24-AUG-2009 15:00	24-AUG-2009 15:00	24-AUG-2009 15:00	24-AUG-2009 15:00
				ES0912618-001	ES0912618-002	ES0912618-003	ES0912618-004	ES0912618-005
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	23.5	16.1	14.3	9.8	13.6
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	9	12	14	15
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	30	41	28	17	20
Copper	7440-50-8	5	mg/kg	11	18	6	16	22
Lead	7439-92-1	5	mg/kg	9	18	16	20	94
Nickel	7440-02-0	2	mg/kg	13	54	8	10	10
Zinc	7440-66-6	5	mg/kg	18	60	23	51	121
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	----	----	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	----	----	----	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	----	----	----	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	----	----	----	<0.5	<0.5

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: COMPOSITE 1	COMPOSITE2	COMPOSITE 3	SLTP 011-0.0	SLTP 009-0.0
				Client sampling date / time: 24-AUG-2009 15:00	24-AUG-2009 15:00	24-AUG-2009 15:00	24-AUG-2009 15:00	24-AUG-2009 15:00
				ES0912618-001	ES0912618-002	ES0912618-003	ES0912618-004	ES0912618-005
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Phenanthrene	85-01-8	0.5	mg/kg	----	----	----	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	----	----	----	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	----	----	----	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	----	----	----	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	----	----	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	----	----	----	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	----	----	----	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	----	----	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	----	----	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	----	----	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	----	----	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	----	----	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	----	----	----	<10	<10
C10 - C14 Fraction	----	50	mg/kg	----	----	----	<50	<50
C15 - C28 Fraction	----	100	mg/kg	----	----	----	**130**	<100
C29 - C36 Fraction	----	100	mg/kg	----	----	----	**120**	<100
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	----	----	----	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	----	----	----	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	----	----	----	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	----	----	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	----	----	----	<0.5	<0.5
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	**96.4**	**90.0**	**75.8**	**85.0**	**85.8**
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	**71.9**	**90.9**	**74.7**	**66.5**	**69.8**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	----	----	----	**81.1**	**94.0**
2-Chlorophenol-D4	93951-73-6	0.1	%	----	----	----	**91.6**	**71.3**
2.4.6-Tribromophenol	118-79-6	0.1	%	----	----	----	**67.6**	**81.5**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	----	----	----	**92.7**	**92.3**
Anthracene-d10	1719-06-8	0.1	%	----	----	----	**83.3**	**87.9**
4-Terphenyl-d14	1718-51-0	0.1	%	----	----	----	**91.2**	**99.4**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	----	----	----	**106**	**96.6**

Analytical Results

Sub-Matrix: SOIL				Client sample ID	COMPOSITE 1	COMPOSITE2	COMPOSITE 3	SLTP 011-0.0	SLTP 009-0.0
				Client sampling date / time	24-AUG-2009 15:00	24-AUG-2009 15:00	24-AUG-2009 15:00	24-AUG-2009 15:00	24-AUG-2009 15:00
Compound	CAS Number	LOR	Unit		ES0912618-001	ES0912618-002	ES0912618-003	ES0912618-004	ES0912618-005
EP080S: TPH(V)/BTEX Surrogates - Continued									
Toluene-D8	2037-26-5	0.1	%		----	----	----	**94.0**	**98.7**
4-Bromofluorobenzene	460-00-4	0.1	%		----	----	----	**99.2**	**93.7**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: SLTP 008-0.3	SLTP 012-0.0	SLTP 010-0.0	SLTP 011-QA01	SLTP 008-QA02
				Client sampling date / time: 24-AUG-2009 15:00	24-AUG-2009 15:00	24-AUG-2009 15:00	24-AUG-2009 15:00	24-AUG-2009 15:00
				ES0912618-006	ES0912618-007	ES0912618-008	ES0912618-009	ES0912618-010
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	19.5	2.5	8.5	10.0	21.3
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	7	14	11	10	8
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	19	21	61	14	15
Copper	7440-50-8	5	mg/kg	26	18	37	13	24
Lead	7439-92-1	5	mg/kg	20	17	11	15	22
Nickel	7440-02-0	2	mg/kg	12	18	47	10	9
Zinc	7440-66-6	5	mg/kg	75	51	48	48	73
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: SLTP 008-0.3	SLTP 012-0.0	SLTP 010-0.0	SLTP 011-QA01	SLTP 008-QA02
Client sampling date / time				24-AUG-2009 15:00	24-AUG-2009 15:00	24-AUG-2009 15:00	24-AUG-2009 15:00	24-AUG-2009 15:00
				ES0912618-006	ES0912618-007	ES0912618-008	ES0912618-009	ES0912618-010
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	**0.7**	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	**0.6**	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	**110**	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	**84.1**	**104**	**97.0**	**103**	**89.3**
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	**70.1**	**75.9**	**62.2**	**113**	**102**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**73.9**	**68.6**	**68.2**	**89.2**	**86.0**
2-Chlorophenol-D4	93951-73-6	0.1	%	**79.0**	**96.0**	**84.5**	**64.6**	**93.7**
2.4.6-Tribromophenol	118-79-6	0.1	%	**70.7**	**75.4**	**59.4**	**56.3**	**63.8**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**79.7**	**83.9**	**79.1**	**82.3**	**80.9**
Anthracene-d10	1719-06-8	0.1	%	**81.6**	**85.2**	**82.9**	**84.0**	**85.8**
4-Terphenyl-d14	1718-51-0	0.1	%	**91.7**	**94.1**	**89.6**	**91.1**	**107**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**107**	**81.3**	**103**	**90.8**	**99.8**

Analytical Results

Sub-Matrix: SOIL				Client sample ID	SLTP 008-0.3	SLTP 012-0.0	SLTP 010-0.0	SLTP 011-QA01	SLTP 008-QA02
				Client sampling date / time	24-AUG-2009 15:00	24-AUG-2009 15:00	24-AUG-2009 15:00	24-AUG-2009 15:00	24-AUG-2009 15:00
Compound	CAS Number	LOR	Unit		ES0912618-006	ES0912618-007	ES0912618-008	ES0912618-009	ES0912618-010
EP080S: TPH(V)/BTEX Surrogates - Continued									
Toluene-D8	2037-26-5	0.1	%		**84.6**	**108**	**100**	**105**	**91.7**
4-Bromofluorobenzene	460-00-4	0.1	%		**95.2**	**107**	**107**	**102**	**90.7**

Surrogate Control Limits

Sub-Matrix: **SOIL**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	10	136
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	10	136
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	24	113
2-Chlorophenol-D4	93951-73-6	23	134
2.4.6-Tribromophenol	118-79-6	19	122
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	30	115
Anthracene-d10	1719-06-8	27	133
4-Terphenyl-d14	1718-51-0	18	137
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

CHAIN OF CUSTODY DOCUMENTATION

135119

CLIENT: GHD Newcastle	SAMPLER: Julian Fowler
ADDRESS / OFFICE: 24 Honeysuckle Drive	MOBILE: 0423163493
PROJECT MANAGER (PM):	PHONE 49729910
PROJECT ID: 2214471	EMAIL REPORT TO: Jesse.Simkus@ghd.com.au
SITE: P.O. NO.:	EMAIL INVOICE TO: (if different to report) melissa.simpson@ghd.com.au
RESULTS REQUIRED (Date): 3Day T.O QUOTE NO.:	

ALS Laboratory Group

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No N/A
SAMPLE TEMPERATURE
CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DIPOSAL:

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

Notes: e.g. Highly contaminated samples
e.g. "High PAHs expected".
Extra volume for QC or trace LORs etc.

SAMPLE INFORMATION (note: S = Soil, W=Water) | CONTAINER INFORMATION

ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	TPH/BTEX	S2 Metals	PAH	OCP	Comp 1	Comp 2	Comp 3
4	SLTP011-0.0	S	24/8/09				X	X	X	X			
11	SLTP011-0.5												
12	SLTP011-0.6												
5	SLTP009-0.0						X	X	X	X			
13	SLTP009-0.3												
14	SLTP008-0.0						X	X	X	X			
6	SLTP008-0.3						X	X	X	X			
15	SLTP008-1.0												
7	SLTP012-0.0						X	X	X	X			
16	SLTP012-0.4												
8	SLTP010-0.0						X	X	X	X			
17	SLTP010-0.4												

Environmental Division
Sydney
Work Order
ES0912618

Telephone : +61-2-8784 8555

RELINQUISHED BY:		RECEIVED BY		METHOD OF SHIPMENT
Name: Julian Fowler	Date: 24/8/09	Name: Hayley Wolfe	Date: 24/8/09	Con' Note No:
Of: GHD	Time: 4:15	Of: ALS Newcastle	Time: 16:25	
Name: Hayley Wolfe	Date: 24/8/09	Name: TASI	Date: 25/8/09	Transport Co:
Of: ALS Newcastle	Time: 5pm	Of: ALS	Time: 8:30am	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserveed Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

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WHITE - LAB COPY
YELLOW - CUSTOMER COPY
PINK - BOOK COPY

CHAIN OF CUSTODY DOCUMENTATION

135120

CLIENT:	GHD Newcastle
ADDRESS / OFFICE:	24 Honeysuckle Drive
PROJECT MANAGER (PM):	
PROJECT ID:	22/4471
SITE:	Stn. RD
P.O. NO.:	
RESULTS REQUIRED (Date):	3 Day T.O
QUOTE NO.:	

SAMPLER:	J. Fowler
MOBILE:	0423 163493
PHONE	49749910
EMAIL REPORT TO:	Jesse.Simkus@ghd.com.au
EMAIL INVOICE TO: (if different to report)	Melissa.Simpson@ghd.com.au

ALS Laboratory Group

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No N/A
SAMPLE TEMPERATURE
CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

Notes: e.g. Highly contaminated samples
e.g. "High PAHs expected".
Extra volume for QC or trace LORs etc.

ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	TPH/BTEX	S2. Metals	PAH	OCP	Composite 1	Composite 2	Composite 3
18	SLTP007-0.5		24/8/09										
19	SLTP007-0.2										X		
(9)	SLTP001-QA01						X	X	X	X			
(10)	SLTP068-QA02						X	X	X	X			
20	SLTP013-0.0											X	
21	SLTP013-0.2												
22	SLTP006-0.0											X	
23	SLTP006-0.2										X		
24	SLTP003-0.0												
25	SLTP003-0.2										X		
26	SLTP002-0.0												X
27	SLTP002-0.2												

(1) Composite 1 = OCP, S2 metals

(2) Composite 2 = OCP, Metals

RELINQUISHED BY:		RECEIVED BY		METHOD OF SHIPMENT
Name: Julian Fowler	Date: 24/8/09	Name: Hayley Wright	Date: 24/8/09	Con' Note No:
Of: GHD	Time: 4:15	Of: ALS Newcastle	Time: 16:25	
Name: Hayley Wright	Date: 24/8/09	Name: TODD	Date: 25/8/09	Transport Co:
Of: ALS Newcastle	Time: 5pm	Of: ALS	Time: 8:30	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserveed Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

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CHAIN OF CUSTODY DOCUMENTATION

135121

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CLIENT:	GHD Newcastle	SAMPLER:	Julian Fowler
ADDRESS / OFFICE:		MOBILE:	0423163493
PROJECT MANAGER (PM):		PHONE	49794400
PROJECT ID:	2214471	EMAIL REPORT TO:	Jesse.Simkus@ghd.com.au
SITE:	Stn. RD.	EMAIL INVOICE TO: (if different to report)	Melissa.Simpson@ghd.com.au
RESULTS REQUIRED (Date):	3 Day T.O	QUOTE NO.:	P.O. NO.:

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No N/A
SAMPLE TEMPERATURE
CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DIPOSAL:

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

SAMPLE INFORMATION (note: S = Soil, W=Water)					CONTAINER INFORMATION		TPH/BTEX	S2. metals	PAH	OCP	Composite 1	Composite 2	Composite 3	Composite 4
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles								
28	SLTP005-0.0	S	24/8/09									X	X	
29	SLTP005-0.5										X			
30	SLTP005-QA03													
31	SLTP004-0.0											X		
32	SLTP004-0.2													
33	SLTP004-QA04												X	
34	SLTP004-QA05													
35	SLTP001-0.0											X		
36	SLTP001-0.2													
37	SLTP001-QA06												X	
38	SLTP001-QA07													

Notes: e.g. Highly contaminated samples
e.g. "High PAHs expected".
Extra volume for QC or trace LORs etc.

(3)
Composite 3 = OCP, S2 metals
composite 4 = send to Labmark for OCP, S2

RELINQUISHED BY:			RECEIVED BY			METHOD OF SHIPMENT
Name:	Julian Fowler	Date: 24/8/09	Name:	Hayley Wolfe	Date: 24/8/09	Con' Note No:
Of:	GHD	Time: 4:15	Of:	NLS Newcastle	Time: 16:25	
Name:	Hayley Wolfe	Date: 24/8/09	Name:	[illegible]	Date: 25/8/09	Transport Co:
Of:	NLS Newcastle	Time: 9pm	Of:	ALS	Time: 8:30am	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserveed Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

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Appendix E

Results Summary Tables

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Table A: **Sample Register**
Client: **ARTC**
Project: **Maitland to Minimbah Third Track Project**
Job No.: **221454521**

							Analysis								
Sample Location (chainage)	Sample Date	Depth	Field ID	Duplicate	Description	PID	TPH	BTEX	PAHs	Asbestos	Metals [1]	OCPs	Total PCBs	Nutrients
215.05	25/08/2009	0.0-0.2	SL-B215.050	-	Silty Sandy Clay, Pale brown/grey	0.0	x	x	x	-	x	x	-	-
215.13	25/08/2009	0.0-0.2	SL-B215.130	-	Silty Sandy Clay, Pale brown/grey	0.0	x	x	x	-	x	x	-	-
215.2	25/08/2009	0.0-0.2	SL-B215.200	SL-B-QA02	Silty Sandy Clay, Pale brown/grey	0.0	x	x	x	-	x	x	-	-
202.45	24/08/2009	0.0-0.3	SLTP 008-0.0	-	Ballast and gravel with Silty Sand	0.0	-	-	-	-	-	-	-	-
		0.3-1.2	SLTP 008-0.3	SLTP 008-QA02	Silty Clayey Ballast, Dark brown to black stained.	0.0	x	x	x	-	x	x	-	-
			SLTP 008-1.0	-		0.0	-	-	-	-	-	-	-	-
202.38	24/08/2009	0.0-0.3	SLTP 009-0.0	-	Silty Clay, Red/brown	18.1	x	x	x	-	x	x	-	-
		0.3-0.4	SLTP 009-1.0	-	Clay, Red/brown	25.6	-	-	-	-	-	-	-	-
202.36	24/08/2009	0.0-0.4	SLTP 010-0.0	-	Silty Sandy ballast, Pale brown/grey	0.0	x	x	x	x	x	x	-	-
		0.4-0.5	SLTP 010-0.4	-	Clay, Grey/brown mottling	0.0	-	-	-	-	-	-	-	-
202.28	24/08/2009	0.0-0.5	SLTP 011-0.0	SLTP 011-QA01	Silty Sandy gravelly ballast, Pale brown/grey	0.0	x	x	x	-	x	x	-	-
		0.5-0.6	SLTP 011-0.5	-	Gravelly Sandy Clay, Dark brown	2.1	-	-	-	-	-	-	-	-
		0.6-1.0	SLTP 011-0.6	-	Clay, brown to pale brown/orange	3.1	-	-	-	-	-	-	-	-
202.46	24/08/2009	0.0-0.2	SLTP 012-0.0	-	Ballast with Sandy Silty Clay, Pale brown/grey	0.0	x	x	x	-	x	x	-	-
		0.2-0.4	SLTP 012-0.2	-	Ballast with Sandy Silty Clay, Black staining	0.0	-	-	-	-	-	-	-	-
		0.4-0.5	SLTP 012-0.4	-	Clay, Grey and orange moittling	0.0	-	-	-	-	-	-	-	-
194.38	25/08/2009	0.0-0.2	SP-T 194.380	-	[Stockpile] Ballast with Clay and Silt fines, Pale brown/grey	0.0	x	x	x	-	x	-	-	-
194.42	25/08/2009	0.0-0.2	SP-T 194.420	-	[Stockpile] Ballast with Clay and Silt fines, Pale brown/grey	0.0	x	x	x	-	x	-	-	-
195.1	25/08/2009	0.0-0.2	SP-T 195.100	-	[Stockpile] Ballast with Clay and Silt fines, Pale brown/grey	0.0	x	x	x	-	x	-	-	-
196.22	25/08/2009	0.0-0.2	SP-W B1	-	[Stockpile] Ballast and Gravel with Silty Clay fines, Black	0.0	x	x	x	-	x	x	-	-
196.22	25/08/2009	0.0-0.2	SP-W DB1	-	[Stockpile] Ballast and Gravel with Silty Clay fines, Dark brown	0.0	x	x	x	-	x	x	-	-
196.22	25/08/2009	0.0-0.2	SP-W DG1	-	[Stockpile] Ballast and Gravel with Silty Clay fines, Dark grey	0.0	x	x	x	-	x	x	-	-
196.22	25/08/2009	0.0-0.2	SP-W PB1	-	[Stockpile] Ballast and Gravel with Silty Clay fines, Pale brown	0.0	x	x	x	-	x	x	-	-
196.22	25/08/2009	0.0-0.2	SP-W PG1	-	[Stockpile] Ballast and Gravel with Silty Clay fines, Pale grey	0.0	x	x	x	-	x	x	-	-
196.1	25/08/2009	0.0-0.2	SP-W196.100	SP-W-QA01	[Stockpile] Large ballast and rocks/boulders, With Silty Clay fines, Dry	0.0	x	x	x	-	x	x	-	-
196.14	25/08/2009	0.0-0.2	SP-W196.140	-	[Stockpile] Ballast, coal and gravel with silt fines, Pale brown	0.0	x	x	x	-	x	x	-	-
196.24	25/08/2009	0.0-0.2	SP-W196.240	-	[Stockpile] Gravel with Silty Clay fines, Pale grey/brown	0.0	x	x	x	-	x	x	-	-
196.39	25/08/2009	0.0-0.2	SP-W196.390	-	[Stockpile] Gravel with Silty Clay fines, Pale grey/white	0.0	x	x	x	-	x	x	-	-
196.4	25/08/2009	0.0-0.2	SP-W196.400	-	[Stockpile] Gravel with Silty Clay fines, Pale grey/brown	0.0	x	x	x	-	x	x	-	-
196.48	25/08/2009	0.0-0.2	SP-W196.480	-	[Stockpile] Gravel with Silty Clay fines, Pale grey/brown	0.0	x	x	x	-	x	x	-	-
196.6	27/08/2009	0.0-0.5	TP196.60 0.0M	-	[Fill] Clay, Brown/grey, Dry	0.0	-	-	-	-	-	-	-	-
		0.5-1.0	TP196.60 0.5M	-		0.0	x	x	x	-	x	x	-	-
		1.0-1.5	TP196.60 1.0M	-		0.0	-	-	-	-	-	-	-	-
		1.5-1.6	TP196.60 1.5M	-	Sandy Clay, Brown/dark grey, Moist	0.0	-	-	-	-	-	-	-	-
196.7	27/08/2009	0.0-0.5	TP196.70 0.0M	-	[Fill] Clay, Brown/grey, Dry	0.0	-	-	-	-	-	-	-	-
		0.5-1.0	TP196.70 0.5M	-		0.0	-	-	-	-	-	-	-	-
		1.0-1.5	TP196.70 1.0M	-		0.0	-	-	-	-	-	-	-	-
		1.5-1.6	TP196.70 1.5M	-	Sandy Clay, Brown/dark grey, Moist	0.0	x	x	x	-	x	x	-	-
196.8	27/08/2009	0.0-0.5	TP196.80 0.0M	-	[Fill] Clay, Brown/grey, Dry	0.0	x	x	x	-	x	x	-	-
		0.5-1.0	TP196.80 0.5M	-		0.0	-	-	-	-	-	-	-	-
		1.0-1.5	TP196.80 1.0M	-	Clay, Orange/brown and grey/black mottling, Moist	0.0	-	-	-	-	-	-	-	-
		1.5-1.6	TP196.80 1.5M	-		0.0	-	-	-	-	-	-	-	-

							Analysis								
Sample Location	Sample Date	Depth	Sample	Duplicate	Description	PID	TPH	BTEX	PAHs	Asbestos	Metals [1]	OCPs	Total PCBs	Nutrients
196.9	27/08/2009	0.0-0.5	TP196.90 0.0M	-	[Fill] Clay, Brown/grey, Dry	0.0	-	-	-	-	-	-	-	-
		0.5-1.0	TP196.90 0.5M	-		0.0	-	-	-	-	-	-	-	-
		1.0-1.5	TP196.90 1.0M	-		0.0	-	-	-	-	-	-	-	-
		1.5-1.6	TP196.90 1.5M	-	Clay, Orange/brown and grey/black mottling, Moist	0.0	x	x	x	-	x	x	-	-
197	27/08/2009	0.0-0.5	TP197.00 0.0M	-	Clay, (Topsoil), Brown/grey, Dry	0.0	-	-	-	-	-	-	-	-
		0.5-1.0	TP197.00 0.5M	-	Clay, (Fill),(Disturbed natural), Orange/brown, Moist	0.0	x	x	x	-	x	x	-	-
		1.0-1.5	TP197.00 1.0M	-		0.0	-	-	-	-	-	-	-	-
		1.5-1.6	TP197.00 1.5M	-		0.0	-	-	-	-	-	-	-	-
197.1	27/08/2009	0.0-0.5	TP197.10 0.0M	-	Clay with ballast and rock/gravel, (Topsoil), Brown/grey, Dry	0.0	x	x	x	-	x	x	-	-
		0.5-1.0	TP197.10 0.5M	-		0.0	-	-	-	-	-	-	-	-
		1.0-1.5	TP197.10 1.0M	-		0.0	-	-	-	-	-	-	-	-
		1.5-1.6	TP197.10 1.5M	-		0.0	-	-	-	-	-	-	-	-
197.2	27/08/2009	0.0-0.5	TP197.20 0.0M	-	Clay, (Topsoil), Brown/grey, Dry	0.0	-	-	-	-	-	-	-	-
		0.5-1.0	TP197.20 0.5M	-		0.0	-	-	-	-	-	-	-	-
		1.0-1.5	TP197.20 1.0M	-		0.0	x	x	x	-	x	x	-	-
		1.5-1.6	TP197.20 1.5M	-		0.0	-	-	-	-	-	-	-	-
197.3	27/08/2009	0.0-0.5	TP197.30 0.0M	-	Clay, (Topsoil), Brown/grey, Dry	0.0	-	-	-	-	-	-	-	-
		0.5-1.0	TP197.30 0.5M	-		0.0	x	x	x	-	x	x	-	-
		1.0-1.5	TP197.30 1.0M	-		0.0	-	-	-	-	-	-	-	-
		1.5-1.6	TP197.30 1.5M	-	Clay, Brown/grey, Moist	0.0	-	-	-	-	-	-	-	-
197.4	27/08/2009	0.0-0.5	TP197.40 0.0M	-	Clay, (Topsoil), Brown/grey, Dry	0.0	x	x	x	-	x	x	-	-
		0.5-1.0	TP197.40 0.5M	-		0.0	-	-	-	-	-	-	-	-
		1.0-1.5	TP197.40 1.0M	-		0.0	-	-	-	-	-	-	-	-
		1.5-1.6	TP197.40 1.5M	-	Clay, Brown/grey, Moist	0.0	-	-	-	-	-	-	-	-
197.54	27/08/2009	0.0-0.3	TP197.54 0.0M	-	Clay with Ballast, Grey/Pale brown, Dry	0.0	x	x	x	-	x	-	-	-
		0.3-0.4	TP197.54 0.0M	-	Clay, Brown/dark grey mottling, Moist	0.0	-	-	-	-	-	-	-	-
197.55	27/08/2009	0.0-0.3	TP197.55 0.0M	TPQA07, TPQA08	Clay with Ballast, Grey/Pale brown, Dry	0.0	x	x	x	-	x	-	-	-
		0.3-0.4	TP197.55 0.3M	-	Clay, Brown/dark grey mottling, Moist	0.0	-	-	-	-	-	-	-	-
197.58	27/08/2009	0.0-0.3	TP197.58 0.0M	-	Clay, Grey/Pale brown, Dry	0.0	x	x	x	-	x	-	-	-
		0.3-0.4	TP197.58 0.3M	-	Clay, Brown/dark grey mottling, Moist	0.0	-	-	-	-	-	-	-	-
203.68	27/08/2009	0.0-0.5	TP203.68 0.0M	-	Clay with some gravel and coal, Brown with black mottling	0.0	-	-	-	-	-	-	-	-
		0.5-1.0	TP203.68 0.5M	-		0.0	-	-	-	-	x	x	-	-
		1.0-1.5	TP203.68 1.0M	-		0.0	-	-	-	-	-	-	-	-
		1.5-1.6	TP203.68 1.5M	-		0.0	-	-	-	-	-	-	-	-
207.97	27/08/2009	0.0-0.3	TP207.97 0.0M	-	Clay, (Topsoil), Brown, Dry	0.0	x	x	x	-	x	-	-	x
		0.3-0.4	TP207.97 0.3M	-	Clay, Dark brown	0.0	-	-	-	-	-	-	-	-
208.07	27/08/2009	0.0-0.3	TP208.07 0.0M	-	Topsoil, Sandy Clay, Dark brown	0.0	x	x	x	-	x	-	-	x
		0.3-0.4	TP208.07 0.3M	-		0.0	-	-	-	-	-	-	-	-
208.17	27/08/2009	0.0-0.3	TP208.17 0.0M	-	Topsoil, Clayey Sand, Dark brown	0.0	x	x	x	-	x	-	-	x
		0.3-0.4	TP208.17 0.3M	-	Sandy/Gravelly Clay, Brown/pale brown	0.0	-	-	-	-	-	-	-	-
208.27	27/08/2009	0.0-0.3	TP208.27 0.0M	-	Topsoil, Clayey Sand, Dark brown	0.0	x	x	x	-	x	-	-	x
		0.3-0.4	TP208.27 0.3M	-	Sandy Clay, Brown/pale brown	0.0	-	-	-	-	-	-	-	-
208.37	27/08/2009	0.0-0.3	TP208.37 0.0M	-	Topsoil, Dark brown/brown	0.0	-	-	-	-	-	-	-	-
		0.3-0.4	TP208.37 0.3M	-	Clayey Sand, Pale brown	0.0	x	x	x	-	x	-	-	x
214.66	26/08/2009	0.0-0.3	TP214.66 0.0M	-	Topsoil, Dark brown	0.0	-	-	-	-	x	x	-	-
		0.3-0.4	TP214.66 0.3M	-	Clay, Orange/brown, Moist	0.0	-	-	-	-	-	-	-	-
214.7	26/08/2009	0.0-0.5	TP214.70 0.0M	-	Topsoil, Brown/grey	0.0	-	-	-	-	x	x	-	-
		0.5-0.6	TP214.70 0.5M	-	Clay, Orange/brown, Moist	0.0	-	-	-	-	-	-	-	-
214.77	26/08/2009	0.0-0.5	TP214.77 0.0M	-	Topsoil, Brown/grey	0.0	-	-	-	-	x	x	-	-
		0.5-0.6	TP214.77 0.5M	-	Clay, Orange/brown, Moist	0.0	-	-	-	-	-	-	-	-
215.48	26/08/2009	0.0-0.3	TP215.48 0.0M	-	Clay, (Topsoil), Brown, Dry to moist	0.0	x	x	x	-	x	-	x	-
		0.3-0.4	TP215.48 0.3M	-		0.0	-	-	-	-	-	-	-	-

							Analysis							
Sample Location	Sample Date	Depth	Sample	Duplicate	Description	PID	TPH	BTEX	PAHs	Asbestos	Metals [1]	OCPs	Total PCBs	Nutrients
215.56	26/08/2009	0.0-0.5	TP215.56 0.0M	-	Clay with trace ballast, (Fill/topsoil), Pale grey/brown, Dry	0.0	x	x	x	-	x	x	-	-
		0.5-0.6	TP215.56 0.5M	-	Clay with some Sand (Weathered Sandstone), Orange/grey mottling, Moist	0.0	-	-	-	-	-	-	-	-
215.62	26/08/2009	0.0-0.5	TP215.62 0.0M	-	Ballast, Sand, Clay with coal, (Fill), Grey/brown	0.0	x	x	x	-	x	x	-	-
		0.5-1.0	TP215.62 0.5M	-	Clay, Orange/brown and grey/black mottling, Moist	0.0	-	-	-	-	-	-	-	-
		1.0-1.5	TP215.62 1.0M	-		0.0	-	-	-	-	-	-	-	-
		1.5-1.6	TP215.62 1.5M	-		0.0	-	-	-	-	-	-	-	-
215.71	26/08/2009	0.0-0.5	TP215.71 0.0M	-	Ballast (fine) with Clay and Sand, (Fill), Dry	0.0	-	-	-	-	-	-	-	-
		0.5-1.0	TP215.71 0.5M	-	Sand, Ballast, Sandstone, Clay, (Fill), Black and orange/brown, Moist	0.0	x	x	x	-	x	x	-	-
		1.0-1.5	TP215.71 1.0M	-	Weathered Sandstone, (Natural?), Orange/brown, Moist	0.0	-	-	-	-	-	-	-	-
		1.5-1.6	TP215.71 1.5M	-		0.0	-	-	-	-	-	-	-	-
215.82	26/08/2009	0.0-0.5	TP215.82 0.0M	-	Clay, Ballast, Coal, Wood, Rock, Moist	0.0	x	x	x	-	x	x	-	-
		0.5-0.6	TP215.82 0.5M	-		0.0	-	-	-	-	-	-	-	-
215.91	26/08/2009	0.0-0.5	TP215.91 0.0M	-	Sand, Ballast, Rock, Clay, (Fill), Black	0.0	x	x	x	-	x	x	-	-
		0.5-1.0	TP215.91 0.5M	-	Sand, Gravel, Large Rocks, Ballast, Clay, (Fill), Pale brown/orange	0.0	-	-	-	-	-	-	-	-
		1.0-1.1	TP215.91 1.0M	-	Sand, Gravel, Large Rocks, Ballast, Clay, (Fill), Pale brown/orange, With thin layers of black	0.0	-	-	-	-	-	-	-	-
216.02	26/08/2009	0.0-0.5	TP216.02 0.0M	-	Gravelly Clay, (Fill), Pale brown, Dry	0.0	-	-	-	-	-	-	-	-
		0.5-1.0	TP216.02 0.5M	TPQA01, TPQA02	Coal, Slag, Clay, Sand, (Fill)	0.0	x	x	x	-	x	x	-	-
		1.0-1.5	TP216.02 1.0M	-		0.0	-	-	-	-	-	-	-	-
		1.5-1.6	TP216.02 1.5M	-	Gravelly Sand with Clay and coal, Moist	0.0	-	-	-	-	-	-	-	-
222.9	26/08/2009	0.0-0.3	TP222.90 0.0M	-	Clay with trace sand, Dark brown, Dry	0.0	-	-	-	-	x	x	-	-
		0.3-0.4	TP222.90 0.3M	-	Sandy Clay, Brown/orange, Moist	0.0	-	-	-	-	-	-	-	-
223	27/08/2009	0.0-0.3	TP223.00 0.0M	-	Topsoil, Dark brown	0.0	-	-	-	-	x	-	-	-
		0.3-0.4	TP223.00 0.3M	-	Sandy Clay, Orange/brown	0.0	-	-	-	-	-	-	-	-
223.1	27/08/2009	0.0-0.3	TP223.10 0.0M	-	Topsoil, Dark brown/black	0.0	-	-	-	-	-	-	-	-
		0.3-0.4	TP223.10 0.3M	-	Clay, Orange/brown	0.0	-	-	-	-	x	-	-	-
223.2	27/08/2009	0.0-0.3	TP223.20 0.0M	-	Topsoil, Dark brown	0.0	-	-	-	-	x	-	-	-
		0.3-0.4	TP223.20 0.3M	-	Sandy Clay, Orange/brown	0.0	-	-	-	-	-	-	-	-
223.3	27/08/2009	0.0-0.3	TP223.30 0.0M	TPQA03, TPQA04	Topsoil, with Sand and some Clay, Pale brown with some orange, Dry to moist	0.0	-	-	-	-	x	-	-	-
		0.3-0.4	TP223.30 0.3M	-	Sandy Clay, Pale brown, Dry	0.0	-	-	-	-	-	-	-	-
223.4	27/08/2009	0.0-0.3	TP223.40A 0.0M	-	Topsoil, Brown	0.0	-	-	-	-	x	-	-	-
		0.3-0.4	TP223.40A 0.3M	-	Clay, Orange/brown	0.0	-	-	-	-	-	-	-	-
223.4	27/08/2009	0.0-0.3	TP223.40B 0.0M	-	Topsoil with some Clay and Sand, Dark brown/black	0.0	-	-	-	-	-	-	-	-
		0.3-0.4	TP223.40B 0.3M	-	Sandy Clay, Red/orange/brown, Moist	0.0	-	-	-	-	x	-	-	-
223.5	27/08/2009	0.0-0.3	TP223.50 0.0M	-	Topsoil, Dark brown	0.0	-	-	-	-	x	-	-	-
		0.3-0.4	TP223.50 0.3M	-	Clay, Orange/brown, Moist	0.0	-	-	-	-	-	-	-	-

[1] Metals included As, Cd, Cr, Cu, Hg, Pb, Ni, and Zn,

Table B: **Metal and Inorganic Results**
Client: **ARTC**
Project: **Maitland to Minimbah Third Track Project**
Job No.: **221454521**

Exceeds EIL
Exceeds HIL F
Bold Exceeds RPD 30%

				Metals								Inorganic			
Field ID	Sample Date	Moisture	Asbestos	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	Nitrogen (Total Oxidised)	Nitrogen (Total)	TKN (as N)	Phosphorus
Units		%	Type	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		1	Y/N	5	1	2	5	5	0.1	2	5	0.1	20	20	2
NEPM 1999 EIL or TC		-	-	20	3	50	100	600	1	60	200	-	-	-	2000
NEPM 1999 HIL F or TC		-	ND	500	100	500	5000	1500	75	3000	35000	-	-	-	-
SL-B215.050	25/08/2009	2.7	-	6	<1	58	12	10	<0.1	18	64	-	-	-	-
SL-B215.130	25/08/2009	1.8	-	14	<1	29	18	25	<0.1	14	64	-	-	-	-
SL-B215.200	25/08/2009	5.1	-	7	<1	26	21	11	<0.1	21	58	-	-	-	-
SL-B-QA02	25/08/2009	4.9	-	8	<1	23	18	12	<0.1	20	54	-	-	-	-
	RPD (%)	*4*	-	*13*	-	*12*	*15*	*9*	-	*5*	*7*	-	-	-	-
SLTP 008-0.3	24/08/2009	19.5	-	7	<1	19	26	20	<0.1	12	75	-	-	-	-
SLTP 008-QA02	24/08/2009	21.3	-	8	<1	15	24	22	<0.1	9	73	-	-	-	-
	RPD (%)	*9*	-	*13*	-	*24*	*8*	*10*	-	*29*	*3*	-	-	-	-
SLTP 009-0.0	24/08/2009	13.6	-	15	<1	20	22	94	<0.1	10	121	-	-	-	-
SLTP 010-0.0	24/08/2009	8.5	ND	11	<1	61	37	11	<0.1	47	48	-	-	-	-
SLTP 011-0.0	24/08/2009	9.8	-	14	<1	17	16	20	<0.1	10	51	-	-	-	-
SLTP 011-QA01	24/08/2009	10	-	10	<1	14	13	15	<0.1	10	48	-	-	-	-
	RPD (%)	*2*	-	***33***	-	*19*	*21*	*29*	-	*0*	*6*	-	-	-	-
SLTP 012-0.0	24/08/2009	2.5	-	14	<1	21	18	17	<0.1	18	51	-	-	-	-
SP-T 194.380	25/08/2009	12.8	-	9	<1	24	11	10	0.5	30	10	-	-	-	-
SP-T 194.420	25/08/2009	12.7	-	10	<1	24	10	11	0.4	25	11	-	-	-	-
SP-T195.100	25/08/2009	7.2	-	<5	<1	23	13	<5	<0.1	92	<5	-	-	-	-
SP-W B1	25/08/2009	1.6	-	14	<1	12	22	22	<0.1	10	22	-	-	-	-
SP-W DB1	25/08/2009	2.7	-	76	<1	23	30	91	<0.1	38	91	-	-	-	-
SP-W DG1	25/08/2009	1.6	-	13	<1	15	18	20	<0.1	14	20	-	-	-	-
SP-W PB1	25/08/2009	18.3	-	6	<1	14	9	51	<0.1	4	51	-	-	-	-
SP-W PG1	25/08/2009	11.6	-	8	<1	16	13	11	<0.1	8	11	-	-	-	-
SP-W196.100	25/08/2009	3.5	-	57	<1	33	30	35	<0.1	16	35	-	-	-	-
SP-W-QA01	25/08/2009	4.3	-	44	<1	24	22	26	<0.1	14	26	-	-	-	-
	RPD (%)	*21*	-	*26*	-	*32*	***31***	*30*	-	*13*	*30*	-	-	-	-
SP-W196.140	25/08/2009	5.3	-	<5	<1	13	7	9	0.5	14	9	-	-	-	-
SP-W196.240	25/08/2009	8.8	-	28	<1	27	28	30	<0.1	17	30	-	-	-	-
SP-W196.390	25/08/2009	3.4	-	32	<1	18	12	24	0.1	<2	24	-	-	-	-
SP-W196.400	25/08/2009	6	-	21	<1	10	16	21	<0.1	8	21	-	-	-	-
SP-W196.480	25/08/2009	6.7	-	18	<1	23	35	32	0.1	22	32	-	-	-	-
TP196.60 0.5M	27/08/2009	15	-	7	<1	15	6	14	<0.1	7	14	-	-	-	-
TP196.70 1.5M	27/08/2009	24.3	-	6	<1	26	12	12	<0.1	12	12	-	-	-	-
TPQA11	27/08/2009	20.9	-	<5	<1	25	12	11	<0.1	11	11	-	-	-	-
	RPD (%)	*15*	-	*18*	-	*4*	*0*	*9*	-	*9*	*9*	-	-	-	-
TP196.80 0.0M	27/08/2009	9.6	-	<5	<1	19	13	17	<0.1	7	17	-	-	-	-
TP196.90 1.5M	27/08/2009	14.9	-	<5	<1	26	13	12	<0.1	16	12	-	-	-	-
TP197.00 0.5M	27/08/2009	12.7	-	<5	<1	20	12	6	<0.1	14	6	-	-	-	-
TP197.10 0.0M	27/08/2009	10.4	-	7	<1	20	7	18	<0.1	8	18	-	-	-	-
TP197.20 1.0M	27/08/2009	11.7	-	<5	<1	22	8	13	<0.1	28	13	-	-	-	-
TP197.30 0.5M	27/08/2009	24.4	-	<5	<1	71	12	26	<0.1	16	26	-	-	-	-
TPQA09	27/08/2009	10	-	6	<1	83	8	18	<0.1	10	18	-	-	-	-
	RPD (%)	***84***	-	*18*	-	*16*	***40***	***36***	-	***46***	***36***	-	-	-	-
TP197.40 0.0M	27/08/2009	13.3	-	<5	<1	37	10	18	<0.1	15	18	-	-	-	-
TP197.54 0.0M	27/08/2009	7.7	-	19	<1	72	51	28	<0.1	8	28	-	-	-	-
TP197.55 0.0M	27/08/2009	6.6	-	9	<1	32	15	21	<0.1	8	21	-	-	-	-
TPQA07	27/08/2009	7.2	-	<5	<1	15	10	13	<0.1	5	13	-	-	-	-
	RPD (%)	*9*	-	***57***	-	***72***	***40***	***47***	-	***46***	***47***	-	-	-	-
TP197.58 0.0M	27/08/2009	8.1	-	8	<1	189	16	31	<0.1	7	31	-	-	-	-
TP203.68 0.5M	27/08/2009	24.1	-	10	<1	33	23	16	<0.1	29	16	-	-	-	-
TP207.97 0.0M	27/08/2009	8	-	<5	<1	10	8	16	<0.1	3	16	0.1	410	410	44
TP208.07 0.0M	27/08/2009	14	-	<5	<1	9	6	10	<0.1	3	10	0.1	290	290	35
TP208.17 0.0M	27/08/2009	8.6	-	8	<1	17	149	34	<0.1	16	34	0.3	400	400	72
TP208.27 0.0M	27/08/2009	17	-	6	<1	17	31	33	<0.1	12	33	<0.1	600	600	140
TP208.37 0.3M	27/08/2009	13.9	-	<5	<1	6	<5	<5	<0.1	<2	<5	<0.1	20	20	11
TP214.66 0.0M	26/08/2009	12.7	-	<5	<1	9	<5	7	<0.1	3	7	-	-	-	-
TP214.70 0.0M	26/08/2009	8.4	-	7	<1	12	7	12	<0.1	9	12	-	-	-	-
TP214.77 0.0M	26/08/2009	10.6	-	36	<1	16	15	25	<0.1	12	25	-	-	-	-
TP215.48 0.0M	26/08/2009	8.3	-	193	<1	15	22	50	0.4	18	50	-	-	-	-
TP215.56 0.0M	26/08/2009	5.4	-	<5	<1	22	18	30	<0.1	14	30	-	-	-	-
TP215.62 0.0M	26/08/2009	11.9	-	69	<1	173	40	70	<0.1	14	70	-	-	-	-
TP215.71 0.5M	26/08/2009	12.9	-	78	<1	16	47	282	<0.1	18	282	-	-	-	-
TP215.82 0.0M	26/08/2009	9.4	-	42	<1	18	66	122	<0.1	12	122	-	-	-	-
TP215.91 0.0M	26/08/2009	10.6	-	23	<1	18	21	58	<0.1	26	58	-	-	-	-
TP216.02 0.5M	26/08/2009	9.6	-	<5	<1	7	23	9	<0.1	21	9	-	-	-	-
TPQA01	26/08/2009	11	-	<5	<1	6	26	8	<0.1	25	8	-	-	-	-
	RPD (%)	*14*	-	-	-	*15*	*12*	*12*	-	*17*	*12*	-	-	-	-
TPQA02	26/08/2009	10	-	2	<0.1	5	22	6	0.09	24	6	-	-	-	-
	RPD (%)	*30*	-	***86***	-	***33***	*4*	***40***	-	*13*	***40***	-	-	-	-
TP222.90 0.0M	26/08/2009	14.3	-	7	<1	17	14	17	<0.1	9	17	-	-	-	-
TP223.00 0.0M	27/08/2009	31.4	-	5	<1	10	23	19	<0.1	4	19	-	-	-	-
TP223.10 0.3M	27/08/2009	16.8	-	<5	<1	8	6	7	<0.1	8	7	-	-	-	-
TP223.20 0.0M	27/08/2009	14.6	-	<5	<1	7	17	12	<0.1	6	12	-	-	-	-
TP223.30 0.0M	27/08/2009	6.6	-	<5	<1	5	7	6	<0.1	2	6	-	-	-	-
TP223.40A 0.0M	27/08/2009	11.7	-	<5	<1	8	25	11	<0.1	6	11	-	-	-	-
TP223.40B 0.3M	27/08/2009	10.5	-	9	<1	8	7	6	<0.1	8	6	-	-	-	-
TP223.50 0.0M	27/08/2009	15.4	-	<5	<1	8	52	11	<0.1	5	11	-	-	-	-

ND = Non detect

Table C: TPH, BTEX and PAH Results
Client: ARTC
Project: Maitland to Minimbah Third Track Project
Job No.: 221454521

Exceeds EIL
Exceeds HIL F
Bold Exceeds RPD 30%

		TPH					BTEX						PAHs																
Field ID	Sample Date	TPH C 6 - C 9 Fraction	TPH C10 - C14 Fraction	TPH C15 - C28 Fraction	TPH C29-C36 Fraction	TPH+C10 - C36 (Detected)	Benzene	Ethylbenzene	Toluene	Xylene (m & p)	Xylene (o)	Xylene Total	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	Sum of PAH's (Detected)
Units		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		10	50	100	100		0.2	0.5	0.5	0.5	0.5		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NEPM 1999 EIL or TC		-	-	-	-	-	1	3.1	1.4	-	-	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NEPM 1999 HIL F or TC		65	-	-	-	1000	1	50	130	-	-	25	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	100
SL-B215.050	25/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
SL-B215.130	25/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
SL-B215.200	25/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
SL-B-QA02	25/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
	RPD (%)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SLTP 008-0.3	24/08/2009	<10	<50	110	<100	110	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
SLTP 008-QA02	24/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
	RPD (%)	-	-	*10*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SLTP 009-0.0	24/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
SLTP 010-0.0	24/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
SLTP 011-0.0	24/08/2009	<10	<50	130	120	250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
SLTP 011-QA01	24/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
	RPD (%)	-	-	*26*	*13*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SLTP 012-0.0	24/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	0.6	1.3
SP-T 194.380	25/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
SP-T 194.420	25/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
SP-T195.100	25/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
SP-W B1	25/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
SP-W DB1	25/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
SP-W DG1	25/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
SP-W PB1	25/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	1	1	1	0.7	<0.5	0.7	<0.5	3	<0.5	<0.5	<0.5	1.7	2.8	11.9
SP-W PG1	25/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
SP-W196.100	25/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
SP-W-QA01	25/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
	RPD (%)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-W196.140	25/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
SP-W196.240	25/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
SP-W196.390	25/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
SP-W196.400	25/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
SP-W196.480	25/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP196.60 0.5M	27/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP196.70 1.5M	27/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TPQA11	27/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
	RPD (%)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP196.80 0.0M	27/08/2009	<10	<50	120	<100	120	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP196.90 1.5M	27/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP197.00 0.5M	27/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP197.10 0.0M	27/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
TP197.20 1.0M	27/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP197.30 0.5M	27/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TPQA09	27/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
	RPD (%)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP197.40 0.0M	27/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP197.54 0.0M	27/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP197.55 0.0M	27/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TPQA07	27/08/2009	<10	<50	120	<100	120	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
	RPD (%)	-	-	*13*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP197.58 0.0M	27/08/2009	<10	<50	140	<100	140	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP207.97 0.0M	27/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP208.07 0.0M	27/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP208.17 0.0M	27/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	0.5	0.6	0.7	<0.5	<0.5	0.5	<0.5	1.7	<0.5	<0.5	<0.5	0.8	1.6	6.4
TP208.27 0.0M	27/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP208.37 0.3M	27/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP215.48 0.0M	26/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP215.56 0.0M	26/08/2009	<10	<50	<100	<100	<250	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.1
TP215.62 0.0M	26/08/2009	<10	<50	280	470	750	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP215.71 0.5M	26/08/2009	<10	<50	120	100	220	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP215.82 0.0M	26/08/2009	<10	<50	160	130	290	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8
TP215.91 0.0M	26/08/2009	<10	<50	330	140	470	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	0.9	0.6	2.3
TP216.02 0.5M	26/08/2009	<10	<50	230	120	350	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TPQA01	26/08/2009	<10	<50	250	150	400	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	0.5
	RPD (%)	-	-	*8*	*22*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPQA02	26/08/2009	<10	<50	180	<100	180	<0.2	<0.5	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
	RPD (%)	-	-	*24*	*13*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table D: OCP & Total PCB's Results
Client: ARTC
Project: Maitland to Minimbah Third Track Project
Job No.: 221454521

Exceeds EIL
Exceeds HIL F
Bold Exceeds RPD 30%

		OCPs																								
Field ID	Sample Date	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Heptachlor (including its epoxide)	Hexachlorobenzene	Methoxychlor	PCBs (Total)
Units		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.05	0.05	0.05		0.05	0.05	0.05	0.05	0.05	0.2		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05		0.05	0.2	0.1
NEPM 1999 EIL or TC																										1
NEPM 1999 HIL F or TC					50							1000									50					50
SL-B215.050	25/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
SL-B215.130	25/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
SL-B215.200	25/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
SL-B-QA02	25/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
RPD (%)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SLTP 008-0.3	24/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
SLTP 008-QA02	24/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
RPD (%)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SLTP 009-0.0	24/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
SLTP 010-0.0	24/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
SLTP 011-0.0	24/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
SLTP 011-QA01	24/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
RPD (%)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SLTP 012-0.0	24/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
SP-W B1	25/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
SP-W DB1	25/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
SP-W DG1	25/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
SP-W PB1	25/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
SP-W PG1	25/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
SP-W196.100	25/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
SP-W-QA01	25/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
RPD (%)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-W196.140	25/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
SP-W196.240	25/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
SP-W196.390	25/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
SP-W196.400	25/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
SP-W196.480	25/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
TP196.60 0.5M	27/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
TP196.70 1.5M	27/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
TPQA11	27/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
RPD (%)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP196.80 0.0M	27/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
TP196.90 1.5M	27/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
TP197.00 0.5M	27/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
TP197.10 0.0M	27/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
TP197.20 1.0M	27/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
TP197.30 0.5M	27/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
TP197.40 0.0M	27/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
TP203.68 0.5M	27/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
TP214.66 0.0M	26/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
TP214.70 0.0M	26/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
TP214.77 0.0M	26/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
TP215.48 0.0M	26/08/2009	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
TP215.56 0.0M	26/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
TP215.62 0.0M	26/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
TP215.71 0.5M	26/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
TP215.82 0.0M	26/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
TP215.91 0.0M	26/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
TP216.02 0.5M	26/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
TPQA01	26/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
RPD (%)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPQA02	26/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-
RPD (%)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP222.90 0.0M	26/08/2009	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.2	-

Table E: Waste Classification
Client: ARTC
Project: Maitland to Minimbah Third Track Project
Job No.: 221454521

Restricted Solid Waste - Exceeds General Solid Waste CT1
Hazardous Waste - Exceeds Restricted Solid Waste CT2

			Metals						BTEX				TPHs		PAHs		OCPs	PCBs	
Field ID	Sample Date	Asbestos fibres	Arsenic	Cadmium	Chromium (VI)	Lead	Mercury	Nickel	Benzene	Toluene	Ethyl Benzene	Total Xylenes	TPH C_6-C_9	TPH C_{10}-C_{36}	B(a)Pyrene	Total PAH	Endosulfan	PCB	Scheduled Chemicals[2]
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
General Solid Waste - CT1			100	20	100	100	4	40	10	288	600	1000	650 [1]	10000 [1]	0.8	200 [1]	60	50 [1]	50 [1]
Restricted Solid Waste - CT2			400	80	400	400	16	160	40	1152	2400	4000	2600 [1]	40000 [1]	3.2	800 [1]	240	50 [1]	50 [1]
SL-B215.050	25/08/2009	-	6	<1	58	10	<0.1	18	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	<0.8
SL-B215.130	25/08/2009	-	14	<1	29	25	<0.1	14	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	<0.8
SL-B215.200	25/08/2009	-	7	<1	26	11	<0.1	21	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	<0.8
SL-B-QA02	25/08/2009	-	8	<1	23	12	<0.1	20	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	<0.8
SLTP 008-0.3	24/08/2009	-	7	<1	19	20	<0.1	12	<0.2	<0.5	<0.5	<1	<10	110	<0.5	-	<0.1	-	<0.8
SLTP 008-QA02	24/08/2009	-	8	<1	15	22	<0.1	9	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	<0.8
SLTP 009-0.0	24/08/2009	-	15	<1	20	94	<0.1	10	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	<0.8
SLTP 010-0.0	24/08/2009	-	11	<1	61	11	<0.1	47	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	<0.8
SLTP 011-0.0	24/08/2009	-	14	<1	17	20	<0.1	10	<0.2	<0.5	<0.5	<1	<10	250	<0.5	-	<0.1	-	<0.8
SLTP 011-QA01	24/08/2009	-	10	<1	14	15	<0.1	10	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	<0.8
SLTP 012-0.0	24/08/2009	-	14	<1	21	17	<0.1	18	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	1.3	<0.1	-	<0.8
SL-B215.050	25/08/2009	-	6	<1	58	10	<0.1	18	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	-
SL-B215.130	25/08/2009	-	14	<1	29	25	<0.1	14	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	-
SL-B215.200	25/08/2009	-	7	<1	26	11	<0.1	21	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	-
SL-B-QA02	25/08/2009	-	8	<1	23	12	<0.1	20	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	-
SLTP010_0.0	24/08/2009	<0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-T 194.380	25/08/2009	-	9	<1	24	10	0.5	30	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	-	-	-
SP-T 194.420	25/08/2009	-	10	<1	24	11	0.4	25	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	-	-	-
SP-T195.100	25/08/2009	-	<5	<1	23	<5	<0.1	92	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	-	-	-
SP-W B1	25/08/2009	-	14	<1	12	22	<0.1	10	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	<0.8
SP-W DB1	25/08/2009	-	76	<1	23	91	<0.1	38	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	<0.8
SP-W DG1	25/08/2009	-	13	<1	15	20	<0.1	14	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	<0.8
SP-W PB1	25/08/2009	-	6	<1	14	51	<0.1	4	<0.2	<0.5	<0.5	<1	<10	<250	1	11.9	<0.1	-	<0.8
SP-W PG1	25/08/2009	-	8	<1	16	11	<0.1	8	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	<0.8
SP-W196.100	25/08/2009	-	57	<1	33	35	<0.1	16	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	<0.8
SP-W-QA01	25/08/2009	-	44	<1	24	26	<0.1	14	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	<0.8
SP-W196.140	25/08/2009	-	<5	<1	13	9	0.5	14	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	<0.8
SP-W196.240	25/08/2009	-	28	<1	27	30	<0.1	17	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	<0.8
SP-W196.390	25/08/2009	-	32	<1	18	24	0.1	<2	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	<0.8
SP-W196.400	25/08/2009	-	21	<1	10	21	<0.1	8	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	<0.8
SP-W196.480	25/08/2009	-	18	<1	23	32	0.1	22	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	<0.8
TP196.60 0.5M	27/08/2009	-	7	<1	15	14	<0.1	7	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	<0.8
TP196.70 1.5M	27/08/2009	-	6	<1	26	12	<0.1	12	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	<0.8
TPQA11	27/08/2009	-	<5	<1	25	11	<0.1	11	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	
TP196.80 0.0M	27/08/2009	-	<5	<1	19	17	<0.1	7	<0.2	<0.5	<0.5	<1	<10	120	<0.5	-	<0.1	-	<0.8
TP196.90 1.5M	27/08/2009	-	<5	<1	26	12	<0.1	16	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	<0.8
TP197.00 0.5M	27/08/2009	-	<5	<1	20	6	<0.1	14	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	<0.8
TP197.10 0.0M	27/08/2009	-	7	<1	20	18	<0.1	8	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	0.5	<0.1	-	<0.8
TP197.20 1.0M	27/08/2009	-	<5	<1	22	13	<0.1	28	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	<0.8
TP197.30 0.5M	27/08/2009	-	<5	<1	71	26	<0.1	16	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	<0.8
TPQA09	27/08/2009	-	6	<1	83	18	<0.1	10	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	-	-	-
TP197.40 0.0M	27/08/2009	-	<5	<1	37	18	<0.1	15	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	<0.1	-	<0.8
TP197.54 0.0M	27/08/2009	-	19	<1	72	28	<0.1	8	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	-	-	-
TP197.55 0.0M	27/08/2009	-	9	<1	32	21	<0.1	8	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	-	-	-
TPQA07	27/08/2009	-	<5	<1	15	13	<0.1	5	<0.2	<0.5	<0.5	<1	<10	120	<0.5	-	-	-	-
TP197.58 0.0M	27/08/2009	-	8	<1	189	31	<0.1	7	<0.2	<0.5	<0.5	<1	<10	140	<0.5	-	-	-	-
TP203.68 0.5M	27/08/2009	-	10	<1	33	16	<0.1	29	-	-	-	-	-		-	-	<0.1	-	<0.8
TP207.97 0.0M	27/08/2009	-	<5	<1	10	16	<0.1	3	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	-	-	-
TP208.07 0.0M	27/08/2009	-	<5	<1	9	10	<0.1	3	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	-	-	-
TP208.17 0.0M	27/08/2009	-	8	<1	17	34	<0.1	16	<0.2	<0.5	<0.5	<1	<10	<250	0.6	6.4	-	-	-
TP208.27 0.0M	27/08/2009	-	6	<1	17	33	<0.1	12	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	-	-	-
TP208.37 0.3M	27/08/2009	-	<5	<1	6	<5	<0.1	<2	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	-	-	-
TP214.66 0.0M	26/08/2009	-	<5	<1	9	7	<0.1	3	-	-	-	-	-	-	-	-	<0.1	-	<0.8
TP214.70 0.0M	26/08/2009	-	7	<1	12	12	<0.1	9	-	-	-	-	-	-	-	-	<0.1	-	<0.8
TP214.77 0.0M	26/08/2009	-	36	<1	16	25	<0.1	12	-	-	-	-	-	-	-	-	<0.1	-	<0.8
TP215.48 0.0M	26/08/2009	-	193	<1	15	50	0.4	18	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	-	-	<0.1	-
TP215.56 0.0M	26/08/2009	-	<5	<1	22	30	<0.1	14	<0.2	<0.5	<0.5	<1	<10	<250	<0.5	1.1	<0.1	-	<0.8
TP215.62 0.0M	26/08/2009	-	69	<1	173	70	<0.1	14	<0.2	<0.5	<0.5	<1	<10	750	<0.5	-	<0.1	-	<0.8
TP215.71 0.5M	26/08/2009	-	78	<1	16	282	<0.1	18	<0.2	<0.5	<0.5	<1	<10	220	<0.5	-	<0.1	-	<0.8
TP215.82 0.0M	26/08/2009	-	42	<1	18	122	<0.1	12	<0.2	<0.5	<0.5	<1	<10	290	<0.5	0.8	<0.1	-	<0.8
TP215.91 0.0M	26/08/2009	-	23	<1	18	58	<0.1	26	<0.2	<0.5	<0.5	<1	<10	470	<0.5	2.3	<0.1	-	<0.8
TP216.02 0.5M	26/08/2009	-	<5	<1	7	9	<0.1	21	<0.2	<0.5	<0.5	<1	<10	350	<0.5	-	<0.1	-	<0.8
TPQA01	26/08/2009	-	<5	<1	6	8	<0.1	25	<0.2	<0.5	<0.5	<1	<10	400	<0.5	0.5	<0.1	-	-
TPQA02	26/08/2009	-	2	<0.1	5	6	0.09	24	<0.2	<0.5	<0.5	<1	<10	180	<0.5	-	<0.1	-	-
TP222.90 0.0M	26/08/2009	-	7	<1	17	17	<0.1	9	-	-	-	-	-	-	-	-	<0.1	-	<0.8
TP223.00 0.0M	27/08/2009	-	5	<1	10	19	<0.1	4	-	-	-	-	-	-	-	-	-	-	-
TP223.10 0.3M	27/08/2009	-	<5	<1	8	7	<0.1	8	-	-	-	-	-	-	-	-	-	-	-
TP223.20 0.0M	27/08/2009	-	<5	<1	7	12	<0.1	6	-	-	-	-	-	-	-	-	-	-	-
TP223.30 0.0M	27/08/2009	-	<5	<1	5	6	<0.1	2	-	-	-	-	-	-	-	-	-	-	-
TP223.40A 0.0M	27/08/2009	-	<5	<1	8	11	<0.1	6	-	-	-	-	-	-	-	-	-	-	-
TP223.40B 0.3M	27/08/2009	-	9	<1	8	6	<0.1	8	-	-	-	-	-	-	-	-	-	-	-
TP223.50 0.0M	27/08/2009	-	<5	<1	8	11	<0.1	5	-	-	-	-	-	-	-	-	-	-	-

[1] Concentrations assessed by Specific Contaminant Concentraion criteria presented in Table 2 of NSW DECC (2008) *Waste Classification Guidelines*
[2] Refers to sum-total of scheduled chemicals listed as Footnote 17 to Table 2 of NSW DECC (2008) *Waste Classification Guidelines*
ND = Non detect