Material	Permanent Batter ⁽¹⁾	Temporary Batter ⁽²⁾
Topsoil, Fill or Soft Soils	4H:1V	3H:1V
Alluvial Soil (Firm to Hard)	3H:1V	2H:1V
Residual Soil (Very Stiff to Hard)	2H:1V	1.5H:1V
Class V Sandstone	1.5H:1V	1H:1V

TABLE 7: RECOMMENDED BATTER SLOPES FOR TRENCHES

Notes:

1 – Permanent Batters refer to batters permanently constructed and left in place over the design life of the pipeline.

2 – Temporary Batters are batter constructed for construction purposes. If steeper batters than these are proposed, then this would need to be assessed by a geotechnical engineer.

These recommendations in Table 7 assume:

- The ground surface is horizontal beyond the crest of the excavation;
- The slopes are well drained with no seepage and runoff concentrated on or above the batter slopes;
- No surcharge loads (such as buildings) are located within a horizontal distance of the cut crest equal to the vertical height of the cut.
- No significant water inflows are encountered within the depth of cut.

Flatter batters than those recommended in Table 7 may be required if the above assumptions do not apply and in particular where Very Soft to Soft Clay Alluvial soils are encountered.

11.3.2 Creek Crossings and Rail Crossing

As indicated in Figure 1, CTP09 and CTP12 are located at topographical low points being a drainage channel and Abernetheys creek respectively. At these locations, the walls of the test pit excavations were observed to be collapsing under their own weight. Care will need to be exercised in this area and trenches may require flatter batters or permanent shoring with adequate drainage during construction for the proposed gas pipeline.

Trenching at these locations and near creek crossings will be problematic. To avoid trenching through these areas, it is recommended that underboring of drainage channels and creek crossings be considered. This is recommended in order to:

- Minimise the development of an alternate erosion path potentially exposing the gas pipeline;
- Avoid development of a erosion point retreat or weak point in the bed of the creek.

If under boring is to be employed, then it is suggested that several boreholes or piezocones be carried out at these areas prior to the commencement of site works to better understand the properties of the underlying soil profile at these locations. Depending on the likely depth of underbore, we would suggest that they be terminated at at least 6m (and potentially deeper) below existing ground surface level, in order to better assess the subsurface conditions.

For the rail crossing area, the pipeline may need to be deepened to accommodate the minimum requirements of Railcorp with respect to installation of services beneath Railcorp railway areas. Appendix H contains general information concerning the Railcorp requirements for minor underbores. It is recommended that Railcorp be consulted prior to finalising the design level of the underbore beneath the Rail track area. A track monitoring plan, a Railcorp approved surveyor and a suitably qualified geotechnical engineer (approved by Railcorp) will need to be engaged to monitor the condition of the track during underboring.

11.4 Retaining Structures

Where there is insufficient room to batter excavations, retaining structures will be required to retain soils and possibly the more weathered rock. Various retention systems could be employed and Coffey would be pleased to provide advice on such systems if provided with details of the proposed structures. In this case it is likely that the most practical solution for the support of trenches would involve the installation of temporary shoring boxes braced with props.

The design of shoring will need to be carried out by a company experienced in the design of such systems. The assumed lateral pressure distributions may need to be modified to account for material layering, surcharge loads due to the ground level not being horizontal, any concentrated pad or strip footing loadings, or hydrostatic pressure due to build-up of water behind the wall (e.g. from broken services).

11.5 Backfill and Compaction of materials within Trenches

In the absence of specific compaction requirements from the designer of the future gas pipeline, recommendations have been provided concerning the type, compaction and testing of the backfill materials. The designers of the gas pipeline may have other specific requirements to ensure uniform support of the gas pipeline is maintained.

The materials used for backfilling of the trenches should be materials capable of providing uniform basal, wall and cover support for the service pipes. In general this material should comprise a granular soil such as a uniform sand or fine gravel sourced from an alluvial quarry or crushed rock quarry source.

The excavated materials from the trenches are not considered suitable materials for backfilling in the immediate vicinity of the pipeline due to the difficulty in achieving uniform basal, wall and roof support for the pipeline. Granular materials 'flow' around pipelines and would be suitable for this purpose. The excavated materials from the pipeline trenches could be used as cover materials once suitably compacted soils have covered the installed pipe.

Suitable sand or gravel backfill materials should be compacted to achieve a minimum density index of at least 70%. Regular testing of the density of backfill materials around the pipeline should be carried out by an appropriately qualified Geotechnical Testing Authority in accordance with the guidelines for trenching works in AS3798-2007.

11.6 Contamination Issues

The results of the assessment identified some potentially contaminating activities and associated AECs and COCs along the proposed pipeline route. These were associated with:

- Storage and use of fuels and chemicals with operations at the former rail yard depot (Railway Street);
- Fill of unknown origin and quality;
- · Possible leaks from the sewer line and nearby treatment plant; and
- Potential application of pesticides and fertilisers (mainly in rural areas, but could have occurred across all parts of the assessment area).

The AECs were assessed as having a low to moderate likelihood of contamination being present.

Evidence of petroleum or other contaminant impacts were not recorded in the sample locations (CBH1/SS01 and CBH2/SS02) excavated opposite the former rail depot. Observations made of this area noted evidence of possible former groundwater monitoring wells suggesting evidence of previous assessments. We recommend that careful observations are made during trenching works within this general area for evidence of odorous or discoloured soils which could suggest evidence of contamination. If evidence of such contamination is noted then, advice should be sought from an experienced environmental consultant and these soils should be kept separate to other soils and adequately managed.

Fill soils were observed at locations along Railway Street and at one location on Fletchers Land and one location on Pestells Lane. The fill along Railway Street had the appearance of mainly roadmaking materials. The other fill at Fletchers and Pestells Lane was described as topsoil fill, but likely to comprise mixtures of topsoil and road making materials on the road verge. Evidence of contamination was generally not recorded in the fill except for one sample where asbestos was detected on Fletchers Lane. Ten additional soil samples were collected and analysed in this area to further assess the potential extent of the asbestos. No further asbestos was identified. The source of the asbestos is not known at this stage, but could be associated with one or more sources such as former break pads or discarded wastes. The presence of asbestos in this area would need be taken into consideration in the earthworks component of the pipeline construction to adequately manage potential risks to human health and appropriate management and disposal of excavated soils.

When handling such materials the work must be carried out by appropriately qualified and licensed contractors in accordance with all relevant codes of practice and standards such as *National Occupational Health and Safety Commission (2005): Code of Practice for the Safe Removal of Asbestos (2nd Ed)[NOHSC:2002(2005)].*

Evidence of contamination impacts from the sewer or the treatment plant were not recorded within Lots 2 and 5 from previous works carried out by Coffey in this area. Elevated concentrations of zinc and lead were noted in groundwater sampled from one well above drinking water and/or protection of freshwater aquatic ecosystem trigger values. The source of the metals was not known and was noted as potentially being associated with background concentrations. Due to the proximity of the adjacent treatment plant, we recommend that any trench dewatering from trenching in Lots 2 and 5 be adequately tested and managed with due regard to potential contaminants.

Other evidence of contamination was not identified across the assessment area.

If any evidence of potential contamination is identified during the pipeline construction such as soils with odours, staining, wastes, drums etc. then Coffey Environments should be contacted to make an assessment of these soils for contamination. Excess soil that requires disposal offsite should be appropriately classified based on the DECC (2009) Waste Classification Guidelines: Part 1 Classifying Waste. If practical during construction, we would recommend that fill soils in the upper parts of the soil profile be kept separate to underlying natural soils as these generally have a higher likelihood of being impacted.

11.7 Acid Sulfate Soil Issues

Some sections of the proposed pipeline extend through areas mapped as having a low probability of acid sulfate soil occurrence. Field observations generally correlated well with the acid sulfate soil risk map. Field screening and laboratory results generally indicated that ASS are not likely to be present at the majority of the site. Based on the results of this assessment it is considered that ASS are likely to be encountered along the lower lying parts of the pipeline route located in Lot 2 and Lot 5 and in the vicinity of creek crossings at CTP09 and CTP12. ASS may also be encountered sporadically up to the intersection with Fletchers Lane and could be located in old paleochanels. It is unlikely that ASS would be intersected in the pipeline construction based on the proposed excavation depths along the majority of Railway Street and Fletchers and Pestells Lane. We recommend that the previous ASSMP (Report Ref: ENVIWOLL00187AB-R02, dated 26 March 2009) prepared for the proposed packing plant (lot 2 and 5) be extended to incorporate other sections of the proposed pipeline where ASS could be intersected.

12 LIMITATIONS

The findings contained in this report are the result of discrete/specific methodologies used in accordance with normal practices and standards. To the best of our knowledge, they represent a reasonable interpretation of the general condition of the site. Under no circumstances, however, can it be considered that these findings represent the actual state of the site at all points.

Should any site conditions be encountered during construction that vary significantly from those discussed in this report, Coffey Environments should be advised and appropriate action taken.

This report does not address issues relating to potentially hazardous building materials or services, which may be present on the site.

13 REFERENCES

- 1. Central Mapping Authority (1986) 1:25,000 Berry Topographic Map 9130-3-N. Second Edition.
- 2. Health Council (2005) Management of Asbestos in the Non-Occupational Environment
- 3. NEPC (1999), National Environment Protection (Assessment of Site Contamination) Measure
- NSW Department of Conservation and Land Management (1993) 1:100,000 Kiama Soil landscape Series Sheet, No 9028 First Edition
- 5. NSW Department of Mines (1952) 1:250,000 Wollongong Geological Series Sheet No. S1 56-9, First Edition
- 6. NSW EPA (1997), Guidelines for Consultants Reporting on Contaminated Sites ISBN07310 3892 4.
- 7. NSW DEC (2006), Guidelines for the NSW Auditor Scheme 2nd Ed. ISBNo0-7313 0177 3
- 8. NSW Acid Sulfate Soil Management Advisory Committee (August 1998) Acid Sulfate Soil Manual
- 9. Standards Australia (2007) AS3798-2007 Guidelines on earthworks for commercial and residential developments, Sydney: Standards Australia
- 10. ASS Management plan (ASSMP) was subsequently developed for Lots 2 and 5 (Report Ref: ENVIWOLL00187AB-R02, dated 26 March 2009).
- 11. Coffey preliminary environmental site assessment and geotechnical investigation (Report Ref: ENVIUNAN00111AA, dated 25 June 2008)



Important information about Coffey Environmental Report

Uncertainties as to what lies below the ground on potentially contaminated sites can lead to remediation costs blow outs, reduction in the value of the land and to delays in the redevelopment of land. These uncertainties are an inherent part of dealing with land contamination. The following notes have been prepared by Coffey to help you interpret and understand the limitations of your report.

Your report has been written for a specific purpose

Your report has been developed on the basis of a specific purpose as understood by Coffey and applies only to the site or area investigated. For example, the purpose of your report may be:

- To assess the environmental effects of an ongoing operation.
- To provide due diligence on behalf of a property vendor.
- To provide due diligence on behalf of a property purchaser.
- To provide information related to redevelopment of the site due to a proposed change in use, for example, industrial use to a residential use.
- To assess the existing baseline environmental, and sometimes geological and hydrological conditions or constraints of a site prior to an activity which may alter the sites environmental, geological or hydrological condition.

For each purpose, a specific approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible, quantify risks that both recognised and unrecognised contamination pose to the proposed activity. Such risks may be both financial (for example, clean up costs or limitations to the site use) and physical (for example, potential health risks to users of the site or the general public).

Scope of Investigations

The work was conducted, and the report has been prepared, in response to specific instructions from the client to whom this report is addressed, within practical time and budgetary constraints, and in reliance on certain data and information made available to Coffey. The analyses, evaluations, opinions and conclusions presented in this report are based on those instructions, requirements, data or information, and they could change if such instructions etc. are in fact inaccurate or incomplete.

Subsurface conditions can change Interpretation of factual data

Subsurface conditions are created by natural processes and the activity of man and may change with time. For example, groundwater levels can vary with time, fill may be placed on a site and pollutants may migrate with time. Because a report is based on conditions which existed at the time of the subsurface exploration, decisions should not be based on a report whose adequacy may have been affected by time. Consult Coffey to be advised how time may have impacted on the project and/or on the property.

Interpretation of factual data

Environmental site assessments identify actual subsurface conditions only at those points where samples are taken and when they are taken. Data derived from indirect field measurements and sometimes other reports on the site are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions. Actual conditions may differ from those inferred to exist, because no professional, no matter how well qualified, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions. For this reason, parties involved with management land acquisition. and/or redevelopment should retain the services of Coffey through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other problems encountered on site.



Your report will only give preliminary recommendations

Your report is based on the assumption that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area. This assumption cannot be substantiated until project implementation has commenced and therefore your report recommendations can only be regarded as preliminary. Only Coffey, who prepared the report, is fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes should be considered with redevelopment or on-going use of the site. If another party undertakes the implementation of the recommendations of this report there is a risk that the report will be misinterpreted and Coffey cannot be held responsible for such misinterpretation.

Your report is prepared for specific purposes and persons

To avoid misuse of the information contained in your report it is recommended that you confer with Coffey before passing your report on to another party who may not be familiar with the background and the purpose of the report. In particular, a due diligence report for a property vendor may not be suitable for satisfying the needs of a purchaser. Your report should not be applied for any purpose other than that originally specified at the time the report was issued.

Interpretation by other professionals

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, retain Coffey to work with other professionals who are affected by the report. Have Coffey explain the report implications to professionals affected by them and then review plans and specifications produced to see how they have incorporated the report findings.

Data should not be separated from the report

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists, engineers or geologists based on their interpretation of field logs (assembled by field personnel), field testing and laboratory evaluation of field samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

Contact Coffey for additional assistance

Coffey is familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to land development and land use. It is common that not all approaches will be necessarily dealt with in your environmental site assessment report due to concepts proposed at that time. As a project progresses through planning and design toward construction and/or maintenance, speak with Coffey to develop alternative approaches to problems that may be of genuine benefit both in time and cost.

Responsibility

Environmental reporting relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it, which is far less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. To help prevent this problem, a number of clauses have been developed for use in contracts, reports and other documents. do Responsibility clauses not transfer appropriate liabilities from Coffev to other parties but are included to identify where Coffey's responsibilities begin and end. Their use is intended to help all parties involved to recognise their individual responsibilities. Read all documents from Coffey closely and do not hesitate to ask any questions you may have.



Important information about your Coffey Report

As a client of Coffey you should know that site subsurface conditions cause more construction problems than any other factor. These notes have been prepared by Coffey to help you interpret and understand the limitations of your report.

Your report is based on project specific criteria

Your report has been developed on the basis of your unique project specific requirements as understood by Coffey and applies only to the site investigated. Project criteria typically include the general nature of the project; its size and configuration; the location of any structures on the site; other site improvements; the presence of underground utilities; and the additional risk imposed by scope-of-service limitations imposed by the client. Your report should not be used if there are any changes to the project without first asking Coffey to assess how factors that changed subsequent to the date of the report affect the report's recommendations. Coffey cannot accept responsibility for problems that may occur due to changed factors if they are not consulted.

Subsurface conditions can change

Subsurface conditions are created by natural processes and the activity of man. For example, water levels can vary with time, fill may be placed on a site and pollutants may migrate with time. Because a report is based on conditions which existed at the time of subsurface exploration, decisions should not be based on a report whose adequacy may have been affected by time. Consult Coffey to be advised how time may have impacted on the project.

Interpretation of factual data

Site assessment identifies actual subsurface conditions only at those points where samples are taken and when they are taken. Data derived from literature and external data source review, sampling and subsequent laboratory testing are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact on the proposed development and recommended actions. Actual conditions may differ from those inferred to exist, because no professional, no matter how qualified, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions. For this reason, owners should retain the services of Coffey through the development stage, to identify variances, conduct additional tests if required, and recommend solutions to problems encountered on site.

Your report will only give

preliminary recommendations

Your report is based on the assumption that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area. This assumption cannot be substantiated until project implementation has commenced and therefore your report recommendations can only be regarded as preliminary. Only Coffey, who prepared the report, is fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes should be considered as the project develops. If another party undertakes the implementation of the recommendations of this report there is a risk that the report will be misinterpreted and Coffey cannot be held responsible for such misinterpretation.

Your report is prepared for specific purposes and persons

To avoid misuse of the information contained in your report it is recommended that you confer with Coffey before passing your report on to another party who may not be familiar with the background and the purpose of the report. Your report should not be applied to any project other than that originally specified at the time the report was issued.



Important information about your Coffey Report

Interpretation by other design professionals

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, retain Coffey to work with other project design professionals who are affected by the report. Have Coffey explain the report implications to design professionals affected by them and then review plans and specifications produced to see how they incorporate the report findings.

Data should not be separated from the report*

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way.

Logs, figures, drawings, etc. are customarily included in our reports and are developed by scientists, engineers or geologists based on their interpretation of field logs (assembled by field personnel) and laboratory evaluation of field samples. These logs etc. should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

Geoenvironmental concerns are not at issue

Your report is not likely to relate any findings, conclusions, or recommendations about the potential for hazardous materials existing at the site unless specifically required to do so by the client. Specialist equipment, techniques, and personnel are used to perform a geoenvironmental assessment.

Contamination can create major health, safety and environmental risks. If you have no information about the potential for your site to be contaminated or create an environmental hazard, you are advised to contact Coffey for information relating to geoenvironmental issues.

Rely on Coffey for additional assistance

Coffey is familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to a project, from design to construction. It is common that not all approaches will be necessarily dealt with in your site assessment report due to concepts proposed at that time. As the project progresses through design towards construction, speak with Coffey to develop alternative approaches to problems that may be of genuine benefit both in time and cost.

Responsibility

Reporting relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it, which is far less exact than the design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. To help prevent this problem, a number of clauses have been developed for use in contracts, reports and other documents. Responsibility clauses do not transfer appropriate liabilities from Coffey to other parties but are included to identify where Coffey's responsibilities begin and end. Their use is intended to help all parties involved to recognise their individual responsibilities. Read all documents from Coffey closely and do not hesitate to ask any questions you may have.

* For further information on this aspect reference should be made to "Guidelines for the Provision of Geotechnical Information in Construction Contracts" published by the Institution of Engineers Australia, National Headquarters, Canberra, 1987.

Figures

ACID SULFATE SOIL, CONTAMINATION AND GEOTECHNICAL INVESTIGATION BOMADERRY NSW



original size

A3

Horizontal Scale (metres) 1:20 000

PROPOSED PIPELINE ROUTE WITH COFFEY TEST LOCATIONS

project no: ENAUWOLL04006AA-R01

figure no: FIGURE 1







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client:	MANILDRA GROUP PTY LTD				
project:	ject: ACID SULFATE SOIL, CONTAMINATION AND GEOTECHNICAL INVESTIGATION PROPOSED GAS PIPLINE, BOMADERRY, NSW				
title: C	APPROXIMATE SAMPLIN ARRIED OUT IN PREVIOUS COI	G LOCATIONS FFEY INVESTIGATION			
project no:	ENAUWOLL04006AA-R01	figure no: FIGURE 1C			

Map Class Description	Depth to Acid Sulfate Soil Materials					
HIGH PROBABILITY	Below water level	Bottom sediments.				
High probability of occurrence of acid sulfate soil materials within the soil profile.		At or near the ground surface.				
The environment of deposition has been suitable for the formation of ocid sulfate soil materials.		Within 1 metre of the ground surface.				
Acid sulfate soit materials are widespread or sporadic and may be buried by alluvium or windblown sediments.		Between 1 and 3 metres below the ground surface.				
		Greater than 3 metres below the ground surface.*				
LOW PROBABILITY	Below water level	Bottom sediments.				
Low probability of occurrence of acid sulfate soil materials within the soil profile.		At or near the ground surface.				
The environment of deposition has generally not been suitable for the formation of acid sulfate soil materials. Soil materials are often Pleistocene in age.		Within 1 metre of the ground surface.				
Acid sulfate soil materials, if present, are sporadic and may be buried by alluvium or windblown sediments.		Between 1 and 3 metres below the ground surface.				
		Greater than 3 metres below the ground surface.*				
NO KNOWN OCCURRENCE Acid sulfate sols are not known or expected to occur in these environments		No known occurrences of ocid sulfate soil materials.				





REFERNCE: BURRIER/BERRY 1:25 000 ACID SOIL RISK MAP (1997) EDITION 2, PREPARED BY THE NSW DEPARTMENT OF LAND AND WATER CONSERVATION (DLWC)



description	drawn	approved	date		drawn	CA/AW	
					approved	CA	coffey
					date	28/07/11	environments
					scale	AS SHOWN	SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMAN
				Horizontal Scale (metres) 1:20 000	original size	A3]

revision

Appendix A Site History Information and Groundwater Bore Search

ACID SULFATE SOIL, CONTAMINATION AND GEOTECHNICAL INVESTIGATION BOMADERRY NSW

Registered Groundwater Bores Within 500m Radius of Pipeline Route

Map created with NSW Natural Resource Atlas - http://www.nratlas.nsw.gov.au



Symbol	Layer	Custor
•	Cities and large towns renderImage: Cannot build image from features	
Cowrai O	Populated places renderImage: Cannot build image from features	
•	Towns	
•	Groundwater Bores	
~	Catchment Management Authority boundaries	
\sim	Major rivers	
 Primary/arterial road Motorway/freeway Railwaγ Runway Contour Background 	Topographic base map	

Copyright © 2011 New South Wales Government. Map has been compiled from various sources and may contain errors or omissions. No representation is made as to its accuracy or suitability.



You are here: <u>Home</u> > <u>Contaminated land</u> > <u>Record of notices</u>

Search results

Your search for: LGA: Shoalhaven City Co		ty Council	Matched 4 notices relating to 2 sites.
			Search Again Refine Search
Suburb	Address	Site Name	Notices related to this site
Nowra	Lamonds Lane	<u>Nowra Gasworks</u>	2 current
Nowra East Page 1 of 1	Kalandar Street	Nowra Mobil Service Static	on 2 current
			18 July 2011

DECCW | Search results

Print Report

Groundwater Works Summary

For information on the meaning of fields please see <u>Glossary</u> Document Generated on Wednesday, July 13, 2011

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW011750

Works Details (top)

GROUNDWATER NUMBER	GW011750
LIC-NUM	10BL004565
AUTHORISED-PURPOSES	DOMESTIC FARMING STOCK
INTENDED-PURPOSES	GENERAL USE
WORK-TYPE	Bore
WORK-STATUS	(Unknown)
CONSTRUCTION-METHOD	Cable Tool
OWNER-TYPE	Private
COMMENCE-DATE	
COMPLETION-DATE	
FINAL-DEPTH (metres)	12.10
DRILLED-DEPTH (metres)	12.20
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	MAYLANDS
GWMA	603 - SYDNEY BASIN
GW-ZONE	-
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	10 - SYDNEY SOUTH COAST
RIVER-BASIN	215 - SHOALHAVEN RIVER
AREA-DISTRICT	
CMA-MAP	9028-3N
GRID-ZONE	56/1
SCALE	1:25,000
ELEVATION	
ELEVATION-SOURCE	(Unknown)
NORTHING	6143898.00
EASTING	281222.00
LATITUDE	34 49' 25"
LONGITUDE	150 36' 28"
GS-MAP	0075C4

AMG-ZONE56COORD-SOURCEGD.,ACC.MAPREMARK

Form-A (top)

COUNTY	CAMDEN
PARISH	BUNBERRA
PORTION-LOT-DP	9

Licensed (top)

COUNTYCAMDENPARISHBUNBERRAPORTION-LOT-DP35 751258

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter; ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE- NO	PIPE- NO	COMPONENT- CODE	COMPONENT- TYPE	DEPTH- FROM (metres)	DEPTH- TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1	1	Casing	(Unknown)	0.00	3.30	152			(Unknown)
1	1	Casing	(Unknown)	0.00	12.10	127			Seated on Bottom
1	1	Opening	Slots	0.00	3.30	152		1	Mechanically Slotted; SL: 0mm; A: 0mm
1	1	Opening	Slots	0.00	12.10	127		2	Mechanically Slotted; SL: 0mm; A: 0mm

Water Bearing Zones (top)

FROM- DEPTH (metres)	TO- DEPTH (metres)	THICKNESS (metres)	ROCK-CAT- DESC	S- W-L	D- D- L	YIELD	TEST- HOLE- DEPTH (metres)	DURATION	SALINITY
1.20	1.20	0.00	Unconsolidated	0.00		0.05			(Unknown)

Drillers Log (top)

FROM	ТО	THICKNESS	DESC	GEO-MATERIAL COMMENT
0.00	12.19	12.19	Gravel Alluvial Water Supply	

Warning To Clients: This raw data has been supplied to the Department of Infrastructure, Planning and Natural Resources (DIPNR) by drillers, licensees and other sources. The DIPNR does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice

should be sought in interpreting and using this data.

Print Report

Groundwater Works Summary

For information on the meaning of fields please see <u>Glossary</u> Document Generated on Wednesday, July 13, 2011

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW028862

Works Details (top)

GW028862
10BL023183
DOMESTIC STOCK
DOMESTIC STOCK
Well
(Unknown)
Hand Dug
Private
1.80
1.80
N/A
603 - SYDNEY BASIN
-

Site Details (top)

REGION	10 - SYDNEY SOUTH COAST
RIVER-BASIN	215 - SHOALHAVEN RIVER
AREA-DISTRICT	
CMA-MAP	9028-3N
GRID-ZONE	56/1
SCALE	1:25,000
ELEVATION	
ELEVATION-SOURCE	(Unknown)
NORTHING	6144585.00
EASTING	280316.00
LATITUDE	34 49' 2"
LONGITUDE	150 35' 53"
GS-MAP	0075C4

AMG-ZONE 56 COORD-SOURCE GD.,ACC.MAP REMARK

Form-A (top)

COUNTY	CAMDEN
PARISH	BUNBERRA
PORTION-LOT-DP	9

Licensed (top)

COUNTY CAMDEN PARISH BUNBERRA PORTION-LOT-DP 44 751258

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter; ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE- NO	PIPE- NO	COMPONENT- CODE	COMPONENT- TYPE	DEPTH- FROM (metres)	DEPTH- TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1	1	Casing	Timber	0.30	0.30	914			(Unknown)

Water Bearing Zones (top)

no details

Drillers Log (top)

FROM	ТО	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	1.82	1.82	Alluvium Water Supply		

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Print Report

Groundwater Works Summary

For information on the meaning of fields please see <u>Glossary</u> Document Generated on Wednesday, July 13, 2011

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW110107

Works Details (top)

GROUNDWATER NUMBER	GW110107
LIC-NUM	10BL602979
AUTHORISED-PURPOSES	MONITORING BORE
INTENDED-PURPOSES	MONITORING BORE
WORK-TYPE	Well
WORK-STATUS	
CONSTRUCTION-METHOD	Auger - Solid Flight
OWNER-TYPE	Private
COMMENCE-DATE	
COMPLETION-DATE	2009-05-07
FINAL-DEPTH (metres)	6.00
DRILLED-DEPTH (metres)	6.00
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	SHOALHAVEN STARCHES PLANT
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	4.02
SALINITY	
YIELD	

Site Details (top)

REGION 10 - SYDNEY SOUTH COAST **RIVER-BASIN AREA-DISTRICT CMA-MAP GRID-ZONE** SCALE **ELEVATION ELEVATION-SOURCE** NORTHING 6140174.00 EASTING 281832.00 34 51' 27" LATITUDE LONGITUDE 150 36' 49" **GS-MAP**

AMG-ZONE 56 COORD-SOURCE REMARK

Form-A (top)

COUNTY	CAMDEN
PARISH	BUNBERRA
PORTION-LOT-DP	62//1078788

Licensed (top)

COUNTY	CAMDEN
PARISH	BUNBERRA
PORTION-LOT-DP	62 1078788

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter; ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE- NO	PIPE- NO	COMPONENT- CODE	COMPONENT- TYPE	DEPTH- FROM (metres)	DEPTH- TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1		Hole	Hole	0.00	6.00	100			Auger - Solid Flight
1	1	Casing	(Unknown)	0.00	3.00	50			Welded
1	1	Opening	Slots - Horizontal	3.00	6.00	50			(Unknown) Casing - Machine Slotted
1		Annulus	Waterworn/Rounded	2.80	6.00				Graded; GS: 0-2mm

Water Bearing Zones (top)

no details

Drillers Log (top)

 FROM
 TO
 THICKNESS
 DESC
 GEO-MATERIAL COMMENT

 0.00
 0.07
 0.07
 ASPHALT

 0.07
 0.50
 0.43
 FILL,GRAVEL,SAND

 0.50
 6.00
 5.50
 SAND/CLAY

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Print Report

Groundwater Works Summary

For information on the meaning of fields please see <u>Glossary</u> Document Generated on Wednesday, July 13, 2011

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW110108

Works Details (top)

GROUNDWATER NUMBER	GW110108
LIC-NUM	10BL602979
AUTHORISED-PURPOSES	MONITORING BORE
INTENDED-PURPOSES	MONITORING BORE
WORK-TYPE	Well
WORK-STATUS	
CONSTRUCTION-METHOD	Auger - Solid Flight
OWNER-TYPE	Private
COMMENCE-DATE	
COMPLETION-DATE	2009-05-08
FINAL-DEPTH (metres)	4.50
DRILLED-DEPTH (metres)	4.50
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	SHOALHAVEN STARCHES PLANT
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	0.64
SALINITY	
YIELD	

Site Details (top)

REGION 10 - SYDNEY SOUTH COAST **RIVER-BASIN AREA-DISTRICT CMA-MAP GRID-ZONE** SCALE **ELEVATION ELEVATION-SOURCE** NORTHING 6140292.00 EASTING 281877.00 34 51' 23" LATITUDE LONGITUDE 150 36' 51" **GS-MAP**

AMG-ZONE 56 COORD-SOURCE REMARK

Form-A (top)

COUNTY	CAMDEN
PARISH	BUNBERRA
PORTION-LOT-DP	1//838753

Licensed (top)

COUNTY	CAMDEN
PARISH	BUNBERRA
PORTION-LOT-DP	62 1078788

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter; ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE- NO	PIPE- NO	COMPONENT- CODE	COMPONENT- TYPE	DEPTH- FROM (metres)	DEPTH- TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1		Hole	Hole	0.00	4.50	100			Auger - Solid Flight
1	1	Casing	PVC Class 15	0.00	1.50	50			Welded - Collar
1	1	Opening	Slots - Horizontal	1.50	4.50	50			PVC Class 15
1		Annulus	Waterworn/Rounded	1.30	4.50				Graded; GS: 0- 2mm

Water Bearing Zones (top)

FROM- DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK- CAT- DESC	S- W-L	D- D- L	YIELD	TEST-HOLE- DEPTH (metres)	DURATION	SALINITY
0.00	0.00	0.00		0.64					

Drillers Log (top)

FROM	ТО	THICKNESS	DESC	GEO-MATERIAL COMMENT
0.00	0.09	0.09	ASPHALT	
0.09	1.05	0.96	FILL.SANDY GRAVEL	
1.05	4.50	3.45	SAND	

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Print Report

Groundwater Works Summary

For information on the meaning of fields please see <u>Glossary</u> Document Generated on Wednesday, July 13, 2011

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW110109

Works Details (top)

GW110109
10BL602979
MONITORING BORE
MONITORING BORE
Well
Auger - Solid Flight
Private
2009-05-08
4.00
4.00
SHOALHAVEN STARCHES PLANT
-
-
1.27

Site Details (top)

REGION 10 - SYDNEY SOUTH COAST **RIVER-BASIN AREA-DISTRICT CMA-MAP GRID-ZONE** SCALE **ELEVATION ELEVATION-SOURCE** NORTHING 6140372.00 EASTING 281920.00 34 51' 20" LATITUDE LONGITUDE 150 36' 52" **GS-MAP**

AMG-ZONE 56 COORD-SOURCE REMARK

Form-A (top)

COUNTY	CAMDEN
PARISH	BUNBERRA
PORTION-LOT-DP	1//838753

Licensed (top)

COUNTY	CAMDEN
PARISH	BUNBERRA
PORTION-LOT-DP	62 1078788

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter; ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE- NO	PIPE- NO	COMPONENT- CODE	COMPONENT- TYPE	DEPTH- FROM (metres)	DEPTH- TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1		Hole	Hole	0.00	4.00	100			Auger - Solid Flight
1	1	Casing	PVC Class 15	0.00	1.00	50			Welded
1	1	Opening	Slots - Horizontal	1.00	4.00	50			PVC Class 15; Casing - Machine Slotted
1		Annulus	Waterworn/Rounded	0.80	4.00				Graded; GS: 0- 2mm

Water Bearing Zones (top)

FROM- DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK- CAT- DESC	S- W-L	D- D- L	YIELD	TEST-HOLE- DEPTH (metres)	DURATION	SALINITY
0.00	0.00	0.00		1.27					

Drillers Log (top)

FROM	то	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	0.14	0.14	ASPHALT		
0.14	0.40	0.26	FILL, SANDY CLAY		
0.40	4.00	3.60	SILTY SAND AND SILTY CLAY		

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A2 AERIAL PHOTOGRAPH REVIEW

A review of aerial photographs dating back to 1961, was conducted by Coffey Environments for the proposed pipeline route.

TABLE A2 – AERIAL PHOTOGRAPH REVIEW

DATE	OBSERVATIONS
21/9/1961	Lot 5 DP825808 and Lot 2 DP825808 appear to be vacant and grassed.
(black & white)	Railway Street is apparent in the photo and there are some structures/developments on either side (possibly commercial/industrial), some lots to the east are vacant.
	The remainder of the proposed pipeline route to the north appears to be vacant/rural landuses.
29/12/1974	Lot 5 DP825808 and Lot 2 DP825808 appear to be vacant and grassed.
(black & white)	Railway Street is apparent in the photo and there some structures/developments on either side (possibly commercial/industrial), some lots to the east are vacant.
	The remainder of the proposed pipeline route to the north appears to be vacant/rural landuses.
26/06/1979	Lot 5 DP825808 and Lot 2 DP825808 appear to be vacant and grassed.
(black & white)	Railway Street is apparent in the photo and there some structures/developments on either side (possibly commercial/industrial), some lots to the east are vacant. There appears to be some disturbance east of Railway Street
	The remainder of the proposed pipeline route to the north appears to be vacant/rural landuses.
February	Lot 5 DP825808 and Lot 2 DP825808 appear to be vacant and grassed.
1993 (colour)	Railway Street is apparent in the photo and there some structures/developments on either side (possibly commercial/industrial), some lots to the east are vacant. There appears to be some disturbance east of Railway Street which includes part of the sewerage treatment plant and at the north eastern end of railway street.
	The remainder of the proposed pipeline route to the north appears to be vacant/rural landuses.
24/03/2002	Lot 5 DP825808 and Lot 2 DP825808 appear to be vacant and grassed.
(Colour)	Development in Railway Street is apparent and appears medium dense in the colour photo and there some structures/developments on either side (possibly commercial/industrial), some lots to the east are vacant. There appears to be some disturbance at the northeast of Railway Street
	The remainder of the proposed pipeline route to the north appears to be vacant/rural landuses.

A search of the NSW OEH website did not show any listings of sites within the Bomaderry area.

Two phone interviews were conducted on the 18 July 2011 with Steve Thompson and Ron Arthur, who are responsible for rural properties located between Railway Street and Fletchers lane, Bomaderry. The interview was aimed at identifying potential areas of concern as a result of contaminating activities or events which may not have been recorded by the OEH database but may have had the potential to have an impact on the proposed pipeline route.

Steve Thompson indicated that he was not aware of any contaminating activities or large events occurring in the study area besides common agricultural practices.

Ron Arthur who has lived in the area for the last 20 years indicated that he has mechanically sprayed the weeds in his paddocks using the chemical Bromide in the past. He also indicated that the old rail yard located to the south of Cambewarra Road on the western side of Railway Street was known to have stored railway sleepers treated with copper arsenic in the past.
Appendix B Site Photographs

ACID SULFATE SOIL, CONTAMINATION AND GEOTECHNICAL INVESTIGATION BOMADERRY NSW



Photo 1 – Looking South-East Along Pestells Lane. The existing Eastern Gas Pipeline Transfer Station is shown to the left of frame



Photo 2 – Looking North-West Along Pestells Lane (SCC Owned Services Corridor)

drawn	СА		client:	MANILDRA GROUP	PTY LTD
approved	MF	coffev	project:	ACID SULFATE SOIL, CONTAMINAT INVESTIGATI	ION AND GEOTECHNICAL
date	14/07/2011	environments		PROPOSED GAS P BOMADERRY I	PIPELINE NSW
scale	NTS	SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE	title:	SITE PHOTO 1/PHOTO 2 SHOWING	THE PROPOSED ROUTE
original size	A4		project r	no: ENAUWOLL04006AA Pr	hoto Plate: 1



Photo 3 – Looking East Along Fletchers Lane.



Photo 4 - Looking South Along SCC Owned Service Corridor and Manildra Owned Land

drawn	СА		client:	MANILDRA GRO	UP PTY LTD
approved	MF	coffev	project:	roject: ACID SULFATE SOIL, CONTAMINATION AND GEOTECHN INVESTIGATION	
date	14/07/2011	environments		PROPOSED GAS BOMADERR	S PIPELINE YY NSW
scale	NTS	SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE	title:	SITE PHOTO 3/PHOTO 4 SHOWI	NG THE PROPOSED ROUTE
original size	A4		project r	no: ENAUWOLL04006AA	Photo Plate: 2



 $\label{eq:photo-star} \textbf{Photo-5} - \textbf{Looking South Along SCC Owned Service Corridor from CTP14} \ .$



Photo 6 – Looking North Along SCC Owned Service Corridor. Existing Gas Pipeline is Present at this location.

drawn	СА		client:	MANILDRA GRO	UP PTY LTD
approved	MF	coffev	project:	ect: ACID SULFATE SOIL, CONTAMINATION AND GEOTECHN INVESTIGATION	
date	14/07/2011	environments		PROPOSED GAS BOMADERR	S PIPELINE Y NSW
scale	NTS	SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE	title:	SITE PHOTO 5/PHOTO 6 SHOWI	NG THE PROPOSED ROUTE
original size	A4		project r	o: ENAUWOLL04006AA	Photo Plate: 3



Photo 7 – Looking South Along Railway Street with CTP03 approximately located 50m in front of silver car.



Photo 8 - Looking south along Railway Street. Gas Pipeline is proposed on western side (truck side) of road

drawn	СА		client:	MANILDRA GRO	UP PTY LTD
approved	MF	coffev	project:	ACID SULFATE SOIL, CONTAMIN INVESTIGA	ATION AND GEOTECHNICAL
date	14/07/2011	environments		PROPOSED GAS BOMADERR	S PIPELINE YY NSW
scale	NTS	SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE	title:	SITE PHOTO 7/PHOTO 8 SHOWI	NG THE PROPOSED ROUTE
original size	A4		project no	o: ENAUWOLL04006AA	Photo Plate: 4

Appendix C Engineering Logs of Boreholes and Test Pits

ACID SULFATE SOIL, CONTAMINATION AND GEOTECHNICAL INVESTIGATION BOMADERRY NSW



Soil Description Explanation Sheet (1 of 2)

DEFINITION:

In engineering terms soil includes every type of uncemented or partially cemented inorganic or organic material found in the ground. In practice, if the material can be remoulded or disintegrated by hand in its field condition or in water it is described as a soil. Other materials are described using rock description terms.

CLASSIFICATION SYMBOL & SOIL NAME

Soils are described in accordance with the Unified Soil Classification (UCS) as shown in the table on Sheet 2.

PARTICLE SIZE DESCRIPTIVE TERMS

NAME	SUBDIVISION	SIZE
Boulders		>200 mm
Cobbles		63 mm to 200 mm
Gravel	coarse	20 mm to 63 mm
	medium	6 mm to 20 mm
	fine	2.36 mm to 6 mm
Sand	coarse	600 μm to 2.36 mm
	medium	200 μm to 600 μm
	fine	75 μm to 200 μm

MOISTURE CONDITION

- Dry Looks and feels dry. Cohesive and cemented soils are hard, friable or powdery. Uncemented granular soils run freely through hands.
- Moist Soil feels cool and darkened in colour. Cohesive soils can be moulded. Granular soils tend to cohere.
- Wet As for moist but with free water forming on hands when handled.

CONSISTENCY OF COHESIVE SOILS

TERM	UNDRAINED STRENGTH S _U (kPa)	FIELD GUIDE
Very Soft	<12	A finger can be pushed well into the soil with little effort.
Soft	12 - 25	A finger can be pushed into the soil to about 25mm depth.
Firm	25 - 50	The soil can be indented about 5mm with the thumb, but not penetrated.
Stiff	50 - 100	The surface of the soil can be indented with the thumb, but not penetrated.
Very Stiff	100 - 200	The surface of the soil can be marked, but not indented with thumb pressure.
Hard	>200	The surface of the soil can be marked only with the thumbnail.
Friable	-	Crumbles or powders when scraped by thumbnail.

DENSITY OF GRANULAR SOILS

MINOR COMPONENTS

TERM	ASSESSMENT GUIDE	PROPORTION OF MINOR COMPONENT IN:
Trace of	Presence just detectable by feel or eye, but soil properties little or no different to general properties of primary component.	Coarse grained soils: <5% Fine grained soils: <15%
With some	Presence easily detected by feel or eye, soil properties little different to general properties of primary component.	Coarse grained soils: 5 - 12% Fine grained soils: 15 - 30%

SOIL STRUCTURE

	ZONING	CE	MENTING
Layers	Continuous across exposure or sample.	Weakly cemented	Easily broken up by hand in air or water.
Lenses	Discontinuous layers of lenticular shape.	Moderately cemented	Effort is required to break up the soil by hand in air or water.
Pockets	Irregular inclusions of different material.		

GEOLOGICAL ORIGIN WEATHERED IN PLACE SOILS Extremely Structure and fabric of parent rock visible. weathered material						
Residual soil	Structure and fabric of parent rock not visible.					
TRANODODTE	D 0011 0					
TRANSPORTE	DSOILS					
Aeolian soil	Deposited by wind.					
Alluvial soil	Deposited by streams and rivers.					
Colluvial soil	Deposited on slopes (transported downslope by gravity).					
Fill	Man made deposit. Fill may be significantly more variable between tested locations than naturally occurring soils.					
Lacustrine soil	Deposited by lakes.					
Marine soil	Deposited in ocean basins, bays, beaches and estuaries.					

coffey **>**

Soil Description Explanation Sheet (2 of 2)

(Exclu	FIELD IDENTIFICATION PROCEDURES (Excluding particles larger than 60 mm and basing fractions on estimated mass)					USC	PRIMARY NAME	
ø	barse .36 mm	EAN VELS ttle no es)	Wide range in grain size and substantial amounts of all intermediate particle sizes.			GW	GRAVEL	
3 mm i	si mm is	/ELS If of cc than 2.	GRA) GRA) (Li fin	Predo with r	ominantly one size or more intermediate siz	a range of sizes es missing.	GP	GRAVEL
SOILS s than 6	l eye)	GRAV than ha is larger	VELS FINES sciable punt nes)	Non- proce	plastic fines (for idented and a see ML below)	tification)	GM	SILTY GRAVEL
AllNED ials less 0.075 m	e nakeo	More fraction	GRA WITH (Appre amo of fij	Plasti see C	c fines (for identificat CL below)	ion procedures	GC	CLAYEY GRAVEL
ARSE GF of mate ger than	ible to th	arse 36 mm	EAN UDS tile no ss)	Wide amou	range in grain sizes a ints of all intermediat	and substantial e sizes	SW	SAND
tn 50% lar	icle vis	DS If of co: than 2.	CLE SAN (Litt	Predominantly one size or a range of sizes with some intermediate sizes missing.			SP	SAND
More tha	illest part	SAN e than hal is smaller	WITH FINES WITH FINES (Appreciable amount of fines)	Non-plastic fines (for identification procedures see ML below).			SM	SILTY SAND
	the sma	More		Plast see C	c fines (for identificat CL below).	tion procedures	SC	CLAYEY SAND
	out		IDENTIFICAT	ION PI	ROCEDURES ON FRA	ACTIONS <0.2 mm.		
Jan L	s ab	0	DRY STREN	GTH	DILATANCY	TOUGHNESS		
olLS less th 075 mi	rticle i	CLAYS limit in 50	None to Low	/	Quick to slow	None	ML	SILT
ED SC aterial ian 0.0	nm pa	TS & (iquid sss the	Medium to H	ligh	None	Medium	CL	CLAY
aRAIN of ma	.075 n	SIL	Low to medi	um	Slow to very slow	Low	OL	ORGANIC SILT
-INE G n 50% is sma	(A 0	AYS nit In 50	Low to medi	um	Slow to very slow	Low to medium	MH	SILT
F re thai 3 mm		S & Cl quid lir ter tha	High		None	High	СН	CLAY
M0 8		SILT	Medium to H	ligh	None	Low to medium	ОН	ORGANIC CLAY
HIGHL' SOILS	HIGHLY ORGANIC Readily identified by colour, odour, spongy feel and frequently by fibrous texture.					Pt	PEAT	

SOIL CLASSIFICATION INCLUDING IDENTIFICATION AND DESCRIPTION

• Low plasticity – Liquid Limit $w_{\rm L}$ less than 35%. • Medium plasticity – $w_{\rm L}$ between 35% and 50%. • High plasticity – $w_{\rm L}$ greater than 50%.

COMMON DEFECTS IN SOIL

TERM	DEFINITION	DIAGRAM	TERM	DEFINITION	DIAGRAM
PARTING	A surface or crack across which the soil has little or no tensile strength. Parallel or sub parallel to layering (eg bedding). May be open or closed.		SOFTENED ZONE	A zone in clayey soil, usually adjacent to a defect in which the soil has a higher moisture content than elsewhere.	ALCONTRACTOR OF
JOINT	A surface or crack across which the soil has little or no tensile strength but which is not parallel or sub parallel to layering. May be open or closed. The term 'fissure' may be used for irregular joints <0.2 m in length.		TUBE	Tubular cavity. May occur singly or as one of a large number of separate or inter-connected tubes. Walls often coated with clay or strengthened by denser packing of grains. May contain organic matter	
SHEARED ZONE	Zone in clayey soil with roughly parallel near planar, curved or undulating boundaries containing closely spaced, smooth or slickensided, curved intersecting joints which divide the mass into lenticular or wedge shaped blocks.		TUBE CAST	Roughly cylindrical elongated body of soil different from the soil mass in which it occurs. In some cases the soil which makes up the tube cast is cemented.	
SHEARED SURFACE	A near planar curved or undulating, smooth, polished or slickensided surface in clayey soil. The polished or slickensided surface indicates that movement (in many cases very little) has occurred along the defect.		INFILLED SEAM	Sheet or wall like body of soil substance or mass with roughly planar to irregular near parallel boundaries which cuts through a soil mass. Formed by infilling of open joints.	



Rock Description Explanation Sheet (1 of 2)

The descriptive to	erms us	ed by Coffey are given below. They are broadly co	onsistent with	n Austra	lian Standard	AS1726-1993.		
DEFINITIONS: Rock Substance	Rock s In engli disinte homog	substance, defect and mass are defined as follows: ineering terms roch substance is any naturally occurring grated or remoulded by hand in air or water. Other ma genous material, may be isotropic or anisotropic.	g aggregate of aterial is descr	f minera ibed usi	ls and organic ng soil descrip	material which cannot be tive terms. Effectively		
Defect Mass	Discor Any bo more s	tinuity or break in the continuity of a substance or sub ody of material which is not effectively homogeneous. It c substances with one or more defects.	ostances. an consist of tw	wo or mo	ore substances	without defects, or one or		
SUBSTANCE D	DESCR	IPTIVE TERMS:	ROCK SI	UBSTA	NCE STRE	NGTH TERMS		
ROCK NAME	Simpl geolo	e rock names are used rather than precise gical classification.	Term A i	bbrev- ation	Point Load Index, I _{s(50)} (MPa)	Field Guide		
PARTICLE SIZE Coarse grained Medium grained Fine grained	Grain s Mainly Mainly Mainly	size terms for sandstone are: 0.6mm to 2mm 0.2mm to 0.6mm 0.06mm (just visible) to 0.2mm	Very Low	VL	Less than 0.1	Material crumbles under firm blows with sharp end of pick; can be peeled with a knife; pieces un to 30mm thick can		
FABRIC	Terms cleava	for layering of penetrative fabric (eg. bedding, age etc.) are:				be broken by finger pressure.		
Massive	No lay	ering or penetrative fabric.	Low		01 to 03	Easily scored with a knife.		
Indistinct	Layerin	g or fabric just visible. Little effect on properties.	LOW	-	0.1 10 0.0	indentations 1mm to 3mm		
Distinct	Layeri easily	ng or fabric is easily visible. Rock breaks more parallel to layering of fabric.				pick point; has a dull sound under hammer. Pieces of		
CLASSIFICATIO	ON OF eviation	WEATHERING PRODUCTS Definition				diameter may be broken by hand. Sharp edges of core may be friable and break		
Residual F Soil	40	Soli derived from the weathering of rock; the mass structure and substance fabric are no longer evident; there is a large change in volume but the soil has not been significantly transported.	Medium	м	0.3 to 1.0	Readily scored with a knife; a piece of core 150mm long by 50mm diameter can be		
Extremely X Weathered Material	w	Material is weathered to such an extent that it has soil properties, ie, it either disintegrates or can be remoulded in water. Original rock fabric still visible	Hiah	н	1 to 3	broken by hand with difficulty. A piece of core 150mm long		
Highly H Weathered Rock	łW	Rock strength is changed by weathering. The whole of the rock substance is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Some minerals are decomposed				by 50mm can not be broken by hand but can be broken by a pick with a single firm blow; rock rings under hammer.		
		to clay minerals. Porosity may be increased by leaching or may be decreased due to the deposition of minerals in pores.	Very High	VH	3 to 10	Hand specimen breaks after more than one blow of a pick; rock rings under		
Moderately M Weathered Rock	ΛW	The whole of the rock substance is discoloured, usually by iron staining or bleaching, to the extent that the colour of the fresh rock is no longer recognisable.	Extremely	ЕН	More than 10	hammer. Specimen requires many		
Slightly S Weathered Rock	6W	Rock substance affected by weathering to the extent that partial staining or partial discolouration of the rock substance (usually by limonite) has taken place. The colour and texture of the fresh rock is recognisable; strength properties are essentially those of the fresh rock substance	High Notes on F	Rock Su	Ibstance Stre	blows with geological pick to break; rock rings under hammer.		
Fresh Bock	FR	Bock substance unaffected by weathering	perpendicu	lar to the	anisotropy. High	a strength anisotropic rocks may		
Notes on Weathe 1. AS1726 suggests substance weathe not practical to de advantage in mak given in AS1726. 2. Where physical an associated with ig "weathering" to g	the term ering con elineate b ing such nd chem gneous ro ive the al	"Distinctly Weathered" (DW) to cover the range of ditions between XW and SW. For projects where it is etween HW and MW or it is judged that there is no a distinction. DW may be used with the definition ical changes were caused by hot gasses and liquids icks, the term "altered" may be substituted for obreviations XA, HA, MA, SA and DA.	 The term "extremely low" is not used as a rock substance strength term. While the term is used in AS1726-1993, the field guide therein makes it clear that materials in that strength range are soils in engineering terms. The unconfined compressive strength for isotropic rocks (and anisotropic rocks which fall across the planar anisotropy) is typically 10 to 25 times the point load index I_S(50). The ratio may vary for different rock types. Lower strength rocks often have lower ratios than higher strength rocks. 					



Rock Description Explanation Sheet (2 of 2)

COMMON ROCK MA Term	I DEFECTS IN SSES Definition	Diagram	Map G Symbol	iraphic Log (Note 1)	DEFECT SHAPE Planar	TERMS The defect does not vary in orientation
Parting	A surface or crack across which the rock has little or no tensile strength.		20		Curved	The defect has a gradual change in orientation
	Parallel or sub parallel to layering (eg bedding) or a planar anisotropy		Beddin 20	g	Undulating	The defect has a wavy surface
	in the rock substance (eg, cleavage). May be open or closed.		Cleava	^{ge} (Note 2)	Stepped	The defect has one or more well defined steps
Joint	A surface or crack across which the rock has little or no tensile strength.	1.5.5			Irregular	The defect has many sharp changes of orientation
	but which is not parallel or sub parallel to layering or planar anisotropy in the rock substance.		60	(Note 2)	Note: The assess influenced	ment of defect shape is partly by the scale of the observation.
	May be open or closed.			(ROUGHNESS Slickensided	TERMS Grooved or striated surface, usually polished
Sheared Zone	Zone of rock substance with roughly parallel near planar, curved or				Polished	Shiny smooth surface
(1016-0)	undulating boundaries cut by closely spaced joints, sheared surfaces or other defects. Some of		35		Smooth	Smooth to touch. Few or no surface irregularities
	the defects are usually curved and intersect to divide the mass into lenticular or wedge shaped blocks.			<i>*</i> -	Rough	Many small surface irregularities (amplitude generally less than 1mm). Feels like fine to coarse sand paper.
Sheared Surface (Note 3)	A near planar, curved or undulating surface which is usually smooth, polished or slickensided.		40	10X80	Very Rough	Many large surface irregularities (amplitude generally more than 1mm). Feels like, or coarser than very coarse sand paper.
Crushed Seam	Seam with roughly parallel almost planar boundaries, composed of		50		COATING TER Clean	MS No visible coating
(1016-0)	fragments of the host rock substance which may be more			•••• • • • • • • •	Stained	No visible coating but surfaces are discoloured
	seam has soil properties.			17 1	Veneer	A visible coating of soil or mineral, too thin to measure; may be patchy
Infilled Seam	Seam of soil substance usually with distinct roughly parallel boundaries formed by the migration of soil into an open cavity or joint, infilled seams less than 1mm thick may be described as veneer or coating on joint surface.				Coating	A visible coating up to 1mm thick. Thicker soil material is usually described using appropriate defect terms (eg, infilled seam). Thicker rock strength material is usually described as a vein.
Extremely	Seam of soil substance, often with		. 32		BLOCK SHAPE Blocky	E TERMS Approximately equidimensional
weathered Seam	gradational boundaries. Formad by weathering of the rock substance in place.		TUTTUT		Tabular	Thickness much less than length or width
		Seam		~	Columnar	Height much greate than cross section
Notes on D 1. Usual	efects: Iy borehole logs show the true dip of defects a	and face sketch	es and sections t	he apparent dip		

2. Partings and joints are not usually shown on the graphic log unless considered significant.

^{3.} Sheared zones, sheared surfaces and crushed seams are faults in geological terms.



GEO 5.3 Issue 3 Rev.2



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z					-	-			FILL; Claye	y GRAVEL: Fine pale brown, well	e to coarse gra compacted, wi	ained, th some	D/M	_		FI	LL: OLD F	ROAD SURFACE	
			SERVED			-		GC	sand. Sandy Clay sub-angular grained san	ey GRAVEL: Fir sandstone grave	ne to coarse gi el, fine to medi	rained, um	D	-		R	ESIDUAL	SOIL	
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*bit	t shown I.	by Si A	uttix DT		water V vane shear (kPa) ▲ 10/1/98 water level P pressuremeter ● on date shown Bs bulk sample ► water inflow R refusal												U VD	dense verv dense	



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approved	CA	coffev	project: ACID SULFATE SOIL, CON INV	NTAMINATION AND GEOTECHNICA
date	19/07/2011	environments	PROPOS BOM	SED GAS PIPELINE MADERRY NSW
scale	NTS	SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE	title: PHOTO OF	F BOREHOLE CBH02
original size	A4		project no: ENAUWOLL04006AA-AA	A Photo Plate: 6

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drawn	RB		client: MANILDRA GROUP PTY LTD
approved	CA	coffev	project: ACID SULFATE SOIL, CONTAMINATION AND GEOTECHNIC INVESTIGATION
date	19/07/2011	environments	PROPOSED GAS PIPELINE BOMADERRY NSW
scale	NTS	SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE	title: PHOTO OF BOREHOLE CBH03
original size	A4		project no: ENAUWOLL04006AA-AA Photo Plate: 7

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ADV							- - 1. <u>0</u> - - 1. <u>5</u>		CL	Sandy CLA yellow/pale	Y: Low to med brown, and a tra	lium plasticity, p ace of fine grain	ale ed gravel.	Wp	F/St	·×				
				•			2. <u>0</u> 2. <u>0</u> - 2. <u>5</u>		СН	Sandy CLA orange/brow grained ang	Y: High plastic vn to red/brown, jular highly weat	ity, iron stained , with some fine thered sandston	to coarse e gravel.	>Wp	F	*	RES		SOIL	
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N			IE OBSERVED		-	- - 0. <u>5</u> -		CL	grained, brc Sandy CLA with some fi gravel, and	wn, with some s Y: Medium pla ine to coarse gra a trace of roots.	sil <u>t.</u> sticity, orange/b ained angular sa	rown, andstone	<wp< td=""><td>St</td><td></td><td>RESID</td><td>UAL SOIL</td><td></td></wp<>	St		RESID	UAL SOIL	
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						1.5 2. <u>0</u> - - - - - - - - - - - - - - - - -			orange/brov Borehole C	vn, medium stre	ngth. d at 1.5m					SANDS CBH05 refusal	STONE Terminated at on sandstone	
Me AS AD RR W CT HA DT B V T *bit	t shown	au au rol wa ca ha dia bla V I TC by suf	ger s ger c ler/tri ashbc ble to nd au atube ank b bit c bit fix	crewing* Irilling* cone ore ool uger it	su M C pei 1 M wa Wa	pport mud casing netratic 2 3 4 1 1 10/1/9 on dat water water	N no resista ranging to refusal 8 water e showr inflow outflow	nil ance b level	notes, sam U ₅₀ ur D di N st NC SI V va P pr Bs bu E er R re	ples, tests ndisturbed sample disturbed sample sturbed sample andard penetration PT - sample recov PT with solid cone ane shear (kPa) ressuremeter ulk sample nvironmental samp fusal	50mm diameter 63mm diameter n test (SPT) ered ble	classific soil des based or system D dr M m W we Wp pla W _L liq	et in	rmbols a classifica t	tion	Cons VS S F VSt H Fb VL L MD D VD	sistency/density very so soft firm stiff very st hard friable very lo loose mediu dense	index oft iff ose m dense

BOREHOLE ENAUWOLL04006AA - LOGS.GPJ COFFEY.GDT 29.7.11



drawn	RB		client:	MANILDRA GRO	UP PTY LTD
approved	СА	coffev	project: A	CID SULFATE SOIL, CONTAMINA INVESTIGA	ATION AND GEOTECHNICAL
date	19/07/2011	environments		PROPOSED GAS BOMADERR	S PIPELINE Y NSW
scale	NTS	SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE	title:	PHOTO OF BORE	HOLE CBH05
original size	A4		project no:	ENAUWOLL04006AA-AA	Photo Plate: 9

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Client:			MAN	VILD	RA (GRO	UP				Date s	tarteo	d:	21.6	2011	
Principa	al:										Date c	ompl	eteo	d: 21.6 .	2011	
Project:	:		CON	ITAI	ИIN,	ASS	5, GE	OTECH + GWATER AS	SSESSME	NT	Logge	d by:		CA		
Test pit	locat	ion:	PRC	POS	SED	GAS	S PIP	ELINE, BOMADERRY,	NSW, 254	1 1	Check	ed by	/:	SM		
equipme	nt type	e and	model:	5T EXC	CAVAT	OR		Pit Orientation: N-S	Easting:	281921	m		R.L	. Surface:	NOT MEASUR	ED
excavatio	on dim ation	info	ons: 2	2m lon	g 0.4	45m wi mat	erial s	ubstance	Northing:	614149	3 m		dat	um:	WGS84 (Appro	DX)
hod benetration	port	er	notes samples, tests, etc		d 14	ohic log	ssification	material		sture	dition sistency/ sity index	pocket די pocket	meter	addit	structure and ional observatio	ns
1 2	3 dns	wat	,	RL n	netres	gra	clas sym	colour, secondary and mino	or components.	, iou	con con den	100 200	400 x			
Ш	N				1 1			TOPSOIL; Gravelly CLAY: Low fine to coarse grained angular gra roots and fine to medium grained	plasticity, brow avel, with some sand.	'n, <w< td=""><td>/p St</td><td></td><td></td><td>TOPSOIL I</td><td>FILL</td><td>-</td></w<>	/p St			TOPSOIL I	FILL	-
		3SERVED			0. <u>5</u> - - 1.0		CL	Sandy CLAY: Medium plasticity stained red/brown pockets, with s grained angular sandstone grave roots.	, orange with irr come fine to coa I, and a trace of	on W arse f	p VSt		×	RESIDUAL	SOIL	 - - - - - - - -
		NONE OF			- - 1.5 - - - 2.0 - - - -		CL/CH	CLAY: Medium to high plasticity iron stained orange/brown to red/ some silt and fine to coarse grain sandstone gravel.	, pale grey with brown pockets, ed angular	with <	/р Н	-	609	EXTREME MATERIAL		- - - - - - - - - - - - - - - - - - -
					2.5	/////		Test pit CTP06 terminated at 2.5r	n					End on sid	w progress	
					- - 3.0											-
method				sup	port			notes, samples, tests	diameter	assification	a symbols a	and		consiste	ncy/density index	
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coney	enviro	Innents	Excav	vation No. CTP07
Engineerin	ng Log - Ex	cavation	Sheet	et 1 of 1 • Job No · FNAUWOLL04006AA
Client: MA	ANILDRA GROUP		Date s	started: 21.6.2011
Principal:			Date of	completed: 21.6.2011
Project: CC	ONTAMIN, ASS, GE	OTECH + GWATER ASSESS	MENT Logge	ed by: CA
Test pit location: PR	ROPOSED GAS PIP	ELINE, BOMADERRY, NSW,	2541 Check	sked by: SM
equipment type and model:	5T EXCAVATOR	Pit Orientation: N-S Eastir	g: 281946 m	R.L. Surface: NOT MEASURED
excavation dimensions: excavation informatio	n material	substance	ng: 6141587 m	datum: WGS84 (Approx)
notes sample water kests, e	s' esterna graphic log symbol	material soil type: plasticity or particle character	'sonsture moisture condition consistency/ density index	tisting kPa
Ц 123 0 > Ш N		TOPSOIL; Clayey SAND: Fine to medium	grained, M MD	
	CH 0.5 1.0 1.5 2.0 2.0 3.0	Sandy CLAY: High plasticity, orange/brow some fine to coarse grained angular sand gravel at 1.2m. Sandy CLAY: Low plasticity, grey, iron stra red/brown, with some highly weathered san gravel. SANDSTONE: Fine to medium grained, iro stained red/brown, medium strength. Test pit CTP07 terminated at 2m	stone <wp h<="" td=""><td>J IOPSOIL RESIDUAL SOIL -</td></wp>	J IOPSOIL RESIDUAL SOIL -
method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration 1 2 3 4 no resistance ranging to refusal water water level on date shown water inflow water outflow	notes, samples, tests Us0 undisturbed sample 50mm diameter Us3 undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols soil description based on unified classifie system moisture D dry M moist W wet Wp plastic limit W_L liquid limit	s and consistency/density index VS very soft S soft F firm St stilff VSt very stiff H hard Fb friable VL very losse L loose MD medium dense D dense VD very dense



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project no: ENAUWOLL04006AA-AA

NTS

A4

scale original

size

Photo Plate: 11

(20)f	fe	ev	2	e	nvi	ro	nments			Excav	ation I	No.	CTP08	
E	Ēnģ	gir	ne	ering	g l	-0(y -	Ex	cavation			Sheet Office	Job N	lo.:	1 of 1 ENAUWO	DLL04006AA
CI	ient:			MAI	NILL	ORA	GRO	UP				Date s	tarted	l:	21.6.201	<u></u> 1
Pr	incipa	al:										Date o	omple	eted	: 21.6.201	1
Dr	nioct			col		мілі	400	CF	OTECH + GWATER A	SSESSME	NT	Loggo	d by:		CA	
т.			4:					םום כי			14	LUgge	u by.		од СМ	
16	st pit	loca	tion:				GAS	SPIP	ELINE, BUMADERRY,	18577, 254		Check	ed by:	:	5M	
eq	uipme	nt typ	e and	a model:	51 E7		10R		Pit Orientation: N-S	Easting:	281965	om Cm		R.L.	. Surface: NOT	MEASURED
ex e	cavation xcavation	on dir	nensi ninfo	ons: ormation	1.5m	long	0.45m	erial s	ubstance	Northing:	614171	6 M		datu	im: WG	584 (Approx)
	u							ç				> X	t ę			
method	5 penetrati	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classificatio symbol	material soil type: plasticity or particle colour, secondary and mino	characteristics, or components.	, moisture	condition consistency density inde	100 200 A pocke	too b meter	structu additional o	ire and bservations
ш		N				_	313		TOPSOIL; Sandy CLAY/Clayey	SAND: Fine to	N	/ MD			TOPSOIL	
						0. <u>5</u>		СН	Sandy CLAY: High plasticity, pa yellow, fine to medium grained sa and silt.	ale brown/pale and, with some r	roots	/p F			ALLUVIAL SOIL	 - - -
			►	ASS	_	-					>V	Vp				-
				ASS		1.0		CL	Sandy CLAY: Medium plasticity red/brown with grey pockets, fine sand, with a trace of roots.	, iron stained to medium grai	ned W	/p VSt			RESIDUAL SOIL	 - -
						- 1. <u>5</u>										-
						-								×		-
						2. <u>0</u> -					<	Vp H				-
						-										
						2.5			Test pit CTP08 terminated at 2.5	m						
																-
	Sketo	:h				3.0			<u> </u>							
m N B R E	ethod	natu exis bacl bullo ripp exca	iral ex ting e khoe t dozer er avator	posure xcavation oucket blade	sı S pe 1	shoring	N on no resista ranging ta refusal	nil ance	notes, samples, tests U ₅₀ undisturbed sample 50mm U ₆₃ undisturbed sample 63mm D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample	n diameter n diameter n diameter sy m D	assificatio bil descript ased on uni rstem oisture dry	n symbols ion fied classific	and cation		consistency/der VS ve S sc F fir St st VS ve H ha	n sity index ery soft ff m iff ery stiff ard
						ater water - on dat - water water	level te showi inflow outflow	n	R refusal	M W W	moist wet p plastic L liquid l	limit imit			Fb fri VL ve L lo MD m D de VD ve	able ory loose ose edium dense onse ory dense



C	0	f	fc			e	nvi	iro	nments		_						
U	U			- y								Excava	atior	n No	CT	P09	
E	ng	ir	e	ering	g l	_0	J -	Ex	cavation			Sheet Office	Job	No.	1 of 1 : EN A	AUWOLL04000	<u>6AA</u>
Clie	nt:			MAI	NILL	ORA	GRO	UP				Date st	tarte	ed:	21.6	5.2011	
Prin	cipal											Date co	omp	olete	ed: 21.6	5.2011	
Proj	ect:			COI	NTA	MIN,	ASS	6, GE	OTECH + GWATER AS	SESSMEI	NT	Logged	d by	:	CA		
Test	t pit l	oca	ion:	PRC	DPO	SED	GAS	S PIP	ELINE, BOMADERRY,	NSW, 254	!1	Checke	ed b	by:	SM		
equip	oment	type	e anc	l model:	5T EX	(CAVA	TOR		Pit Orientation: N-S	Easting:	281992 m			R.I	L. Surface:	NOT MEASURED	,
exca exc	vatior	i dim	iensi	ons: prmation	1.5m	long	0.45m	wide erial s	ubstance	Northing:	6141863 ı	n		da	tum:	WGS84 (Approx)	
	tion							E E				ex <	et	r ç			
nethod	penetrat	support	water	notes samples, tests, etc	RI	depth	graphic log	classificatic	material	characteristics,	noisture	consistency density inde	0 + pocke	Penet	addi	structure and tional observations	
ш	123	N	_					0 0	TOPSOIL; Sandy CLAY: High pla	asticity, brown,	>Wp	S	28	2 8 9 	TOPSOIL		
						-		СН	fine to medium grained sand, with	some roots.	<u></u>						
					_	0. <u>5</u>			silt and fine grained sand, and a tr	ace of roots.			×		Slight S04	odour	-
000000			-	ASS		-									Test pit w	all falling in under owr	, -
						-									weight at	0.6m	-
000000					_	1.0											_
				ASS		-											_
000000						-		CL	CLAY: Medium plasticity, pale ye with some fine grained sand, and a	ellow/pale brown a trace of roots	n,						-
					-	1. <u>5</u>		SC	Clavey SAND: Fine to medium of	rained arev wi	ith W	MD					_
				ASS					a trace of silt.	rainea, groy, m							
000000						-											-
					-	2.0	/ /										_
				ASS		-	/										
						-											-
						2.5			Test pit CTP09 terminated at 2.5m	1					End on st	eady progress	
						-	-										
						-											-
						3.0											
meti N	hod	natu	al ex	oosure	sı S	ipport shorina	N	l nil	notes, samples, tests U_{50} undisturbed sample 50mm of	diameter so	assification s il descriptior	ymbols a	and		consist VS	ency/density index very soft	
X BH		exist back	ing ex hoe b	cavation ucket	pe	enetratio	on		U ₆₃ undisturbed sample 63mm D disturbed sample	diameter ba sys	sed on unified	d classifica	ation		S F	soft firm	
B R		bulld rippe	ozer l r	blade		234	no resista ranging t	ance o	V vane shear (kPa) Bs bulk sample	mo	oisture				St VSt	stiff very stiff	
E		exca	vator		w	ater	refusal		E environmental sample R refusal	D	dry moist				H Fb	hard friable	
					_	water on dat	level te showi	n		W	p plastic lim	iit				very loose loose	
						water water	inflow outflow			vv.	L indono mum				D VD	dense very dense	



project no:	ENAUWOLL04006AA-AA
project no.	

A4

size

Photo Plate: 13

			≠y `	-	G	IV					E	Excava	tion	No.	СТР	10	
Eng	in	e	ering	gl	-00) -	Ex	cavation			(Sheet Office J	lob N	No.:	1 of 1 ENAU	JWOLL0400	6A/
Client:			MAN	VILE	DRA (GRO	OUP				[Date st	arteo	d:	21.6.2	2011	
Principal:											[Date co	ompl	ete	d: 21.6.2	2011	
Project:			CON	ITA	MIN,	AS	S, GE	OTECH + GWATER A	SSESSME	NT	L	ogged	l by:		CA		
Fest pit lo	ocat	ion:	PRC	PO	SED	GA	S PIP	ELINE, BOMADERRY	, NSW, 254	41	(Checke	ed by	<i>'</i> :	SM		
quipment	type	and	model:	5T EX	CAVAT	OR		Pit Orientation: N-S	Easting:	28201	l8 m			R.L	Surface:	NOT MEASURED)
xcavation	dim	ensio	ons: 2	2m lo	ng 0.	45m v	vide	ubstanco	Northing:	61420)18 m	1		dat	um:	WGS84 (Approx)	
EXCaval			mation			ma						\ X	t d	5			
letnod penetrati	upport	ater	notes samples, tests, etc		depth	raphic log	lassificatio ymbol	material soil type: plasticity or particl	e characteristics	,	ondition	onsistency ensity inde	A pocke	e meter	si additic	tructure and onal observations	
[⊨] 123	N	3		RL	metres			colour, secondary and min TOPSOIL; Sandy CLAY: Low t pale yellow/brown, fine to mediu some roots.	or components. o medium plastic m grained sand,	city, , with	M	MD	200	400	TOPSOIL		
					0.5			Sandy CLAY: Madium placticit	v red/orange w		Wn	St					-
					-		CL	some silt, and a trace of roots ar grained angular sandstone grave	ad fine to coarse		wp	51			REGIDURE		-
					1.0								×				-
					1. <u>5</u>		CL	Sandy Gravelly CLAY: Medium orange/brown with some pale ye	n plasticity, llow/pale brown			Н			EXTREMEL MATERIAL	Y WEATHERED	
					 2. <u>0</u>			sandstone gravel.	neu nginy neu					×			
		Seepage			-										End on clow		-
					2.5	[]]]]	1	Test pit CTP10 terminated at 2.5	śm						End on slow	progress	
																	-
Sketch					3.0												
method N r X e BH t B t R r E e	natur existi backl bullde rippe excav	al exp ng ex noe b ozer b r vator	oosure cavation ucket olade	su s pe 1 ₩ Wi ¥	shoring enetratio 2 3 4 ater water - on dat - water	n no resis anging refusal level e shov inflow	N nil tance to	notes, samples, tests Uso undisturbed sample 50mm Uso undisturbed sample 63mm D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	n diameter n diameter sy m D M W W W W W	lassificati oil descri ased on u ystem noisture dry mois / wet /p plast /_ liquic	t t t t ic limit	mbols a classifica	nd		consisten VS F St VSt H Fb VL L MD D	cy/density index very soft soft firm stiff very stiff hard friable very loose loose medium dense dense	

TESTPIT ENAUWOLL04006AA - LOGS.GPJ COFFEY.GDT 29.7.11



C	0	f	fc			e	nvi	ro	nments		_					
		4		- y							l	Excava	tion N	o. C	CTP11	
E	ng	jir	e	ering	g l	_0	J -	Ex	cavation		:	Sheet Office J	lob No	1 of .: E	1 INAUWOLL04	006AA
Cli	ent:			MAN	VILL	DRA	GRO	UP				Date st	arted:	2	1.6.2011	
Pri	ncipal	:									I	Date co	mplet	ed: 2	1.6.2011	
Pro	oject:			CON	ITA	MIN,	ASS	6, GE	OTECH + GWATER AS	SESSMEN	NT I	Logged	by:	С	A	
Те	st pit l	ocat	ion:	PRC	PO	SED	GAS	S PIP	ELINE, BOMADERRY, I	NSW, 254	1	Checke	d by:	S	М	
equ	ipmen	t type	e and	model:	5T EX	(CAVA	TOR		Pit Orientation: N-S	Easting:	282038 m		R	.L. Surfac	e: NOT MEASU	RED
exc ex	avatior cava	n dim tion	iensio info	ons: ormation	1.5m	long	0.45m mat	wide erial s	substance	Northing:	6142154 n	า	d	atum:	WGS84 (App	rox)
	ation			notos			0	noi	material			dex	ket etro-	D.		
poq	enetra	port	er	samples,			ohic lo	sificat bol	material		sture	sistene sity inc	pend pend	a	structure and dditional observati	ons
met	123	Idns	wate	16313, 610	RL	depth metres	grap	clas sym	soil type: plasticity or particle c colour, secondary and minor	characteristics, components.	mois	cons	кга 300 200 200 200	400		
ш		N				-			TOPSOIL; Sandy CLAY: Low plas	sticity, brown,	<wp< td=""><td>F</td><td></td><td>TOPS</td><td></td><td></td></wp<>	F		TOPS		
						-		UL	Sandy CLAY: Medium plasticity, i orange/brown, with some fine to co	iron stained barse grained		VSI	×	RESIL	JUAL SOIL	-
			ED			0.5			angular sanusione graver, and a tra	ace of foots.						
			SERV			-								×		_
			E OB(-		CL	Sandy CLAY: Medium plasticity, o	orange/brown				EXTR	EMELY WEATHERE	D
			NON			1. <u>0</u>			angular sandstone gravel.	o coarse graine	a			MATE	RIAL	
						-										_
						4 -										-
						1. <u>5</u> _										
		8				_			SANDSTONE: Fine to medium gra	ained,					Y WEATHERED STONE	
						2.0			Test pit CTP11 terminated at 1.7m					End or	n very slow progress	-
						-										_
						-										_
						2. <u>5</u>										
						-										_
						-										_
\vdash						3.0										
	sketch	1														
me	thod				sı	upport			notes, samples, tests	cla	ssification s	/mbols a	nd	con	sistency/density inde	x
N X		natur exist	al exp ing exp	cavation	S	shoring	N	nil	U ₅₀ undisturbed sample 50mm d U ₆₃ undisturbed sample 63mm d	diameter soi diameter bas	I description sed on unified	classifica	ition	VS S	very soft soft	
BR		bulld	ozer t r	blade		2 3 4	no resista	ance	V vane shear (kPa) Bs bulk sample	mo	visture			St VSt	stiff very stiff	
E		exca	vator		 w	ater	refusal	U .	E environmental sample R refusal	D	dry moist			H Fb	hard friable	
					[⊥	water on dat	level te showi	٦		W Wp	wet plastic lim	t		VL L	very loose	
						- water water	inflow outflow			WL	iiquid limit			D VD	medium der dense very dense	ise



CC)f	fe	2V		e	nvi	ro	nments		-		<i></i>			
			- y	1							Excava	ition N	o. C	TP12	
Eng	gir	۱e	ering	g L	.00	J -	Ex	cavation			Sheet Office	Job No	1 of 1 o.: EN	IAUWOLL040	06AA
Client:			MAI	NILD	RA	GRO	UP				Date st	arted:	21	.6.2011	
Principa	al:										Date co	omplet	ed: 21	.6.2011	
Project	:		COI	VTAI	ИIN,	ASS	6, GE	OTECH + GWATER AS	SSESSME	NT	Logged	l by:	CA	1	
Test pit	loca	tion:	PRC)POS	SED	GAS	S PIP	ELINE, BOMADERRY,	NSW, 254	1	Checke	ed by:	SN	Λ	
equipme	nt typ	e and	d model:	5T EX(OR	ido	Pit Orientation: N-S	Easting:	282092 m	n m	R	L. Surface	: NOT MEASURE	ED ()
excavati	atior	n info	ormation	2111 1011	y 0.	mat	erial s	ubstance	Northing.	01424011		u	alum.	WG364 (Approx	()
lethod penetration	upport	ater	notes samples, tests, etc		depth	aphic log	assification /mbol	material soil type: plasticity or particle	characteristics	, loisture ondition	onsistency/ ensity index	k bocket benetro-	ad	structure and ditional observation	s
^Е 12 Ш	3 ⁰⁰	>		RL n	netres	ي ۲۱۱۲	S C	colour, secondary and mino TOPSOIL; CLAY: High plasticity	v, brown, with	E 8 >Wp	S S	200 300	⁸ ∣ TOPSO	IL	
					-			some silt and roots.							_
					-		СН	Sandy CLAY: High plasticity, bro	own, with some				ALLUVI	AL/ESTUARINE SOIL	
			ASS	-	0. <u>5</u>							×			_
					-										-
					1.0										_
			ASS		_										_
					-										_
				-	1. <u>5</u>		СН	Sandy CLAY: High plasticity, gr	ev. fine grained		St	×			
			ASS		-		-	sand, and some silt.	,, .,			×			_
					-										_
			ASS	-	2. <u>0</u>							×			_
				-	-										-
					2.5								End on	steady progress	-
					-			Test pit CTP12 terminated at 2.5r	n						_
					-										-
					3.0										
Sketo	h														
method				sup	oport			notes, samples, tests	cl	assification s	ymbols a	ind	consi	istency/density index	-+
N X BH	natu exis	ting ex	posure cavation	S s	snoring	N	nil	U ₅₀ undisturbed sample 50mm U ₆₃ undisturbed sample 63mm D disturbed sample	diameter so	ni description ased on unified stem	n d classifica	ation	VS S F	very soft soft firm	
BR	bullo	dozer er	blade	1 2		no resista	ance	V vane shear (kPa) Bs bulk sample	m	oisture			St VSt	stiff very stiff	
E	exca	avator		wat	ter	efusal	-	E environmental sample R refusal	D M	dry moist			H Fb	hard friable	
				┸	water I on date	level e showi	n		W	p plastic lim	nit +		VL L	very loose loose	
					water i water o	inflow outflow			vv	L indrara mutu			D VD	dense very dense	



CO		E	y		e	IV	-				Excava	ation No	D. CT	P13	
	ine	96		g L VILL) - GRC		cavation			Office	Job No.	.: ENA 22.6	UWOLL0400	6A/
Principal:										l	Date co	omplete	ed: 22.6	.2011	
Project:			cor	VTA	MIN,	AS	S, GE	OTECH + GWATER AS	SSESSMENT	r 1	Logged	d by:	СА		
Test pit lo	catio	n:	PRC)PO	SED	GA	S PIP	ELINE, BOMADERRY,	NSW, 2541		Checke	ed by:	SM		
quipment t	type a	nd r	nodel:	5T EX	(CAVAT	OR		Pit Orientation: N-S	Easting: 2	282129 m		R.	L. Surface:	NOT MEASURED)
xcavation of	dimer	sior	IS:	2m lo	ng 0	45m w	vide	what was	Northing: 6	6242631 n	n	da	atum:	WGS84 (Approx)	
Excavation S			mation			ma		Substance			<u> </u>	t Ģ			
method 5 penetrati	support	Matel	notes samples, tests, etc	RL	depth metres	graphic log	classificatio symbol	material soil type: plasticity or particle colour, secondary and mind	characteristics, or components.	moisture condition	consistency density inde	100 A penetr	addi	structure and ional observations	
	N		ASS	_	0. <u>5</u>			TOPSOIL; CLAY: High plasticity some roots and silt and a trace o	r, brown, with f fine grained sand.	Wp	VSt	×	TOPSOIL		-
			ASS	-	1. <u>0</u>		СН	CLAY: High plasticity, brown to iron stained orange/brown pocke trace of roots.	grey with some ts, some silt, and a	- <wp td="" w<=""><td>p</td><td>×</td><td>ALLUVIAL</td><td>SOIL</td><td>- </td></wp>	p	×	ALLUVIAL	SOIL	-
			455	-	1. <u>5</u>										
				-	2.0							×			-
			ASS	-	2.5			Test pit CTB12 terminoted at 2.5					End on slo	w progress	-
					3.0										-
Sketch															
method N n: X e: BH b: B b: R rij E e:	atural xisting ackho ulldoz pper xcava	expo exca e buo er bla	sure avation ket ade	si S per Wi	apport shoring 2 3 4 ater water - water	no resist ranging refusal level e show inflow	N nil tance to	notes, samples, tests U _{s0} undisturbed sample 50mm U _{s3} undisturbed sample 63mm D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	n diameter n diameter	ification sy lescription d on unified m ture dry moist wet plastic limit liquid limit	ymbols a classifica it	ation	Consiste VS F St VSt H Fb VL L MD D	ency/density index very soft soft firm stiff very stiff hard friable very loose loose medium dense dense	


coffev	enviror	nments	-			
concy				Excavation	n No.	CTP14
Engineering	Log - Ex	cavation		Sheet Office Job	1 of No.: 1	ENAUWOLL04006AA
Client: MANI	LDRA GROUP			Date starte	ed: 2	22.6.2011
Principal:				Date comp	oleted:	22.6.2011
Project: CONT	TAMIN, ASS, GE	OTECH + GWATER ASSESS	MENT	Logged by	: (CA
Test pit location: PROP	POSED GAS PIP	ELINE, BOMADERRY, NSW,	2541	Checked b	oy:	SM
equipment type and model: 5T		Pit Orientation: N-S Eastin	ig: 282149 m	n m	R.L. Surfa	Ace: NOT MEASURED
excavation information	material s	ubstance	11g. 0142740		datum:	WGS84 (Approx)
poulut de la construction de la	aphic log mbol	material	oistics, stics,	nsistency/ insity index pocket	b penetro- meter	structure and additional observations
Ē ₁₂₃ [₩] R	RL metres සි පී බි	colour, secondary and minor componer TOPSOIL: CLAY: High plasticity brown v	ents. Ēଔ	39 4 6		SOIL
ASS ASS ASS ASS ASS ASS ASS ASS ASS	0.5 0.5 1.0 1.0 CH CH CH 2.0 2.5	Some silt and roots. CLAY: High plasticity, brown with some of pockets, and some silt, and a trace of roots CLAY: High plasticity, orange/brown and gome fine to medium grained sand and silt. Some fine to medium grained sand and silt. Test pit CTP14 terminated at 2.5m	rey, wtih KWp/W	VSt >	×	JVIAL SOIL
Sketch	3.0					
method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration 1 2 3 4 no resistance ranging to refusal water water level on date shown water inflow water outflow	notes, samples, tests Us0 undisturbed sample 50mm diameter Us0 undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification s soil description based on unifier system moisture D dry M moist W wet Wp plastic lim W _L liquid limit	symbols and n d classification hit	St VS S F H Fb VL Mi D V V V V V V V V V V V V V V V V V V	nsistency/density index S very soft soft firm stiff St very stiff hard friable very loose loose D medium dense dense very dense

			THE S			
					R	
drawn	RB		client:	M	ANILDRA GRO	
approved	CA	coffev	project:	ACID SULFATE SO	IL, CONTAMIN INVESTIGA	ATION AND GEOTECHNICAL
date	19/07/2011	environments		Р	ROPOSED GAS BOMADERR	S PIPELINE Y NSW
scale	NTS	SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE	title:	Р	HOTO OF TEST	PIT CTP14
original size	A4		project n	D: ENAUWOLL0400)6AA-AA	Photo Plate: 18

CO	ff	ev	2	e	nvi	roi	nments							
		Cy								Excava	ation N	0.	CTP15	
Engi	ine	erin	g l	-0] -	Ex	cavation			Sheet Office	Job No	1 5.:	of 1 ENAUWO	LL04006AA
Client:		MA	NILL	ORA	GRO	UP				Date st	tarted:		22.6.2011	
Principal:										Date c	omplet	ed:	22.6.2011	
Project:		CO	NTA	MIN,	ASS	, GE	OTECH + GWATER AS	SESSME	NT	Logged	d by:		CA	
Test pit lo	catior	n: PR	OPO	SED	GAS	S PIP	ELINE, BOMADERRY,	NSW, 254	1	Checke	ed by:		SM	
equipment t	type ar	nd model:	5TEX		TOR 45m wi	do	Pit Orientation: N-S	Easting:	282169 n	n	F	R.L. Si	urface: NOT	MEASURED
excavation	on in	formation	211110	ng u.	mat	erial s	ubstance	Northing.	0142831		0	atum.	. wgs	
method 5 penetration	support water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle colour, secondary and minor	characteristics,	, moisture condition	consistency/ density index	100 A pocket 200 A penetro-	400 meter	structur additional ob	e and oservations
ш	N			-			TOPSOIL; CLAY: High plasticity, with some silt and roots, and a tra-	black/dark gre	ed <wp< td=""><td>o St</td><td></td><td>T</td><td>OPSOIL</td><td>_</td></wp<>	o St		T	OPSOIL	_
				0. <u>5</u>		СН	sand. CLAY: High plasticity, grey with s orange/brown pockets, with a trac grained sand and fine to coarse gr ground	some iron stain e of roots, fine rained angular	ed Wp	VSt	×	A	LLUVIAL SOIL	
		ASS	_	-			gravei.							-
														-
	SERV	ASS		1. <u>0</u> _					<wp< td=""><td>,</td><td>×</td><td></td><td></td><td></td></wp<>	,	×			
				-										-
	2 Z			1. <u>5</u>							×			-
				-										-
				-										-
				2.0						Н		×		_
				-										_
				25									nd on slow progre	- 224
				2.5			Test pit CTP15 terminated at 2.5m	1					in on oron progre	_
				-										-
				3.0										-
Sketch														
Method N n: X e: BH b: B bi R ri E e:	atural e xisting ackhoe ulldoze pper excavato	exposure excavation bucket r blade or	si S produce w W	apport shoring enetratic 2 3 4 ater water - on dat - water water	N no resista ranging to refusal level te showr inflow outflow	nil Ince	notes, samples, tests U ₅₀ undisturbed sample 50mm U ₈₃ undisturbed sample 63mm D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	diameter diameter diameter D M W W W W	assification ii descriptio ased on unifie rstem oisture dry moist wet p plastic lin L liquid lim	symbols a n d classific: nit it	and		consistency/density VS ver S soft F firm St stift VSt ver H hai Fb firia VL ver L loo MD me D der VD ver	sity index y soft t n f y stiff d ble y loose se dium dense nse y dense



рното	OF	TEST	ΡΙΤ	CTP15
111010	U			011 10

project no: ENAUWOLL04006AA-AA

date

scale original

size

NTS

A4

Photo Plate: 19

CO	Π	эу (e			intents		-	Excava	tion No	. CT	P16	
Engi	ne	ering	g Lo	<u>- g</u>	Ex	cavation			Sheet Office	Job No.	1 of 1 : ENA	AUWOLL040	06AA
Client:		MAN	NILDRA	A GR	OUP				Date st	arted:	22.6	5.2011	
Principal:									Date co	omplete	ed: 22.6	5.2011	
Project:		CON		V, AS	SS, GE	OTECH + GWATER AS	SESSMEN	IT	Logged	l by:	CA		
Test pit loo	cation:	PRC	POSE	D GA	AS PIP	ELINE, BOMADERRY,	NSW, 2541	1	Checke	ed by:	SM		
equipment ty	ype and	i model:	51 EXCAV	0.45m	wide	Pit Orientation: N-S	Easting:	282191 m	m	R.I	L. Surface:	NOT MEASURE	ED
excavation	on info	ormation	Ziniong	0.40m	aterial s	ubstance	Northing.	01423331		ua	tum.	WG364 (Applo.	×)
method penetration	support vater	notes samples, tests, etc	dep RI metri	8 th graphic log	symbol	material soil type: plasticity or particle	characteristics,	moisture	consistency/ density index	00 × pocket 00 × penetro- 00 meter	addi	structure and itional observation	IS
— 123 Ш	N				}	TOPSOIL; CLAY: High plasticity	, brown, with	<wp< td=""><td>F</td><td>2 2 8 4</td><td>TOPSOIL</td><td></td><td>_</td></wp<>	F	2 2 8 4	TOPSOIL		_
		ASS ASS ASS			СН	Some roots. CLAY: High plasticity, grey with orange/brown pockets, with a trac to coarse grained sub-angular gra Sandy CLAY: High plasticity, gre orange/brown pockets, with a trac to coarse grained sub-angular gra Test pit CTP16 terminated at 2.5m	some iron staine e of roots and fir vel.	he Wp	St	× ×	End on st	eady progress	
Sketch N na X ey BH ba B bu R rig E ey	atural ex xisting ex ackhoe b ulldozer l pper xcavator	posure ccavation ucket olade	suppor S shori 1 2 3 water water	t ing ation rangin rangin refusa ter level date sho	N nil istance ig to	notes, samples, tests Us0 undisturbed sample 50mm Us3 undisturbed sample 63mm D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	diameter diameter diameter D M W W P W L	ssification s I description ed on unified tem isture dry moist wet plastic lim liquid limit	ymbols a l l classifica	ind ation	Consist VS S F St VSt H Fb VL L MD	ency/density index very soft soft firm stiff very stiff hard friable very loose loose medium dense	

approved CA project: ACID SULFATE SOIL, CONTAMINATION AND GEOTECH
date 19/07/2011 COTTEY INVESTIGATION PROPOSED GAS PIPELINE BOMADERRY NSW
scale NTS SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE title: PHOTO OF TEST PIT CTP16
original project no: ENAUWOLL04006AA-AA Photo Plate: 20

~~	f	Fc		Pe	nvi	iro	nments		_					
	1		-y						_	Excava	tion N	0.	CTP17	
Enç	gir	e	erin	g Loợ	J -	Ex	cavation			Sheet Office	Job No	1 .:	of 1 ENAUWOLLO	4006AA
Client:			MAI	NILDRA	GRO	UP				Date st	arted:		22.6.2011	
Principa	al:									Date co	omplet	ed:	22.6.2011	
Project:			COI	NTAMIN,	ASS	6, GE	OTECH + GWATER AS	SESSME	NT	Logged	l by:		CA	
Test pit	locat	ion:	PRC	POSED	GAS	S PIP	ELINE, BOMADERRY,	NSW, 254	!1	Checke	ed by:		SM	
equipmer	nt type	e and	model:	5T EXCAVA	TOR		Pit Orientation:	Easting:	282284 m		R	.L. Sı	Inface: NOT MEAS	JRED
excavation excavation	on dim Ation	info	ons: ormation	2m long 0.	.45m w mat	ide erial s	substance	Northing:	6143258 r	n	da	atum:	WGS84 (Ap	orox)
hod benetration	port	er	notes samples, tests, etc	d a set th	ohic log	ssification	material	- L	sture dition	sistency/ sity index	pocket penetro- motor		structure and additional observat	ions
1 2 E	3 dns	wat	,	RL metres	gral	clas sym	colour, secondary and mino	r components.	moi	con den	300 10 300 10	400		
Ш	N			-			TOPSOL; CLAY: Medium plastic some fine grained roots.	city, brown, with	wp	F		Т	DPSOIL	-
				-		СН	CLAY: High plasticity, brown wit	h some orange		VSt				
				0.5			pockets, with a trace of fine graine fine to coarse grained gravel.	ed sand, roots a	and		×			-
			ASS											-
] -										_
		RVED		1.0							×			_
		BSEI	ASS											-
		NE C		-										-
		Q		1.5										
			ASS											-
				1 -										_
				2.0							×			-
				-										-
														-
				2.5								Er	nd on steady progress	-
					-		Test pit CTP17 terminated at 2.5r	n						-
														-
				3.0	-									-
Sketc	h				•									
method	nativ	alev	osure	support	N	l nil	notes, samples, tests	diameter	assification s	ymbols a	nd	Τ	consistency/density inde	ex
X	existi	ng ex	cavation	o shoring	N		U ₆₃ undisturbed sample 50mm	diameter ba	ised on unified	classifica	ation		S soft	
B	bulld	ozer l r	blade	penetratio	on no resista	ance	V vane shear (kPa)	sy	oisturo			-	St stiff	
E	exca	vator			ranging t refusal	0	E environmental sample	D	dry				H hard	
				water water	level		iv relusal	W	wet	i+			VL very loose	
				on dat	inflow	1		W	Plastic IIm L liquid limit	n.			MD medium de	ense
				water	outflow								VD dense VD very dense	



coffey 🗸	enviro	nments		-	Excava	ition No.	CTP18
Engineering Lo	g - Ex	cavation			Sheet Office	Job No.:	1 of 1 ENAUWOLL04006AA
Client: MANILDR	A GROUP				Date st	arted:	4.5.2011
Principal:					Date co	ompleted	: 4.5.2011
Project: CONTAM	V. ASS. GE	OTECH + GWATER AS	SESSMEN	т	Logged	l by:	СА
Test pit location: PROPOSE	D GAS PIP	PELINE. BOMADERRY.	NSW. 2541		Checke	ed by:	SM
equipment type and model: 7T CAT B	ACKHOE	Pit Orientation: E-W	Easting:	282230 m	1	R.L.	Surface: NOT MEASURED
excavation dimensions: 2m long	0.45m wide		Northing:	6143289	m	datu	ım: WGS84 (Approx)
excavation information	material	substance					
notes samples, et do tests, etc de tests, etc de de tests, etc de tests, etc de tests,	8 Ho graphic log classification symbol	material soil type: plasticity or particle of colour, secondary and minor	characteristics,	moisture condition	consistency/ density index	00 A pocket 00 ad penetro- 00 meter	structure and additional observations
U 123 E E 0 ASS 0 ASS 1 ASS 1 ASS 2 ASS		TOPSOIL; CLAY: Medium plastic some roots and silt, with a trace of grained sand and fine to coarse gr gravel. CLAY: Medium plasticity, brown/g iron stained orange/brown pockets and fine to medium grained sand, a fine to medium grained sand, a CLAY: High plasticity, iron staine with grey pockets, some fine to me sand, and a trace of fine to mediur sub-angular ironstone gravel.	d orange/brown d orange/brown adianed angular		St/VSt	X X X X X X X	TOPSOIL
Sketch method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator water V V on	t ng N nil tion and resistance ranging to refusal refusal er level date shown	notes, samples, tests U ₅₀ undisturbed sample 50mm of U ₆₃ undisturbed sample 63mm of D disturbed sample 63mm of Sturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	diameter diameter diameter	sification s description don unified em sture dry moist wet plastic lim ilquid limi	ymbols a h d classifica	ind ation	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense



CO	I	E	y		e	IV		intents			Ē	Excava	tion No	D. (CTP19	
Engi	ne	96	erin	g I	_oç	J -	Ex	cavation			5 (Sheet Office J	lob No	1 of .: E	1 E NAUWOL	.L04006A
Client:			MAI	NILL	ORA (GRC	DUP				[Date sta	arted:	4	4.5.2011	
Principal:											[Date co	mplete	ed: 4	4.5.2011	
Project:			COI	NTA	MIN,	ASS	S, GE	OTECH + GWATER A	SSESSME	NT	L	.ogged	by:	C	CA	
Test pit loo	catio	n:	PRC		SED	GA.	S PIP	ELINE, BOMADERRY	, NSW, 254	41	(Checke	ed by:	5	SM	
equipment ty	ype a dimer	nd r	nodel:	71 C/ 2m lo	AT BAC	КНОЕ 45m м	vide	Pit Orientation: E-W	Easting:	2818	332 m 3349 m		R.	.L. Surfa	wgsa	EASURED
excavation	on ir	for	mation	211110	ng o.	ma	terial s	ubstance	Noruning.	014	50-10 m		uc	atum.	W000-	
ethod penetration	pport		notes samples, tests, etc		depth	aphic log	assification mbol	material	e characteristics	s.	oisture ndition	nsistency/ nsity index	A pocket benetro- meter		structure additional obs	and ervations
^۳ 123	ns :	Ň		RL	metres	ы Б	sy cla	colour, secondary and min	or components.	icity	Ĕ S	de Co Co Co Co Co Co Co Co Co Co Co Co Co	300 2 00		SOIL	
-			E	_	-			brown, with some silt and roots, grained gravel.	and a trace of fi	ine	<wb< td=""><td>51</td><td></td><td></td><td>SOIL</td><td>-</td></wb<>	51			SOIL	-
					0.5		СН	CLAY: High plasticity, grey to d	ark grey mottle		Wp			ALLU		
			ASS		-			pale orange/pale brown, with somedium grained sand.	me roots and fin	ne to	·					
					-											-
		ן נ ן			1.0								×			-
			ASS	-	-								×			-
					-											-
				_	1.5								×			-
		┢	ASS	-	-		СН	sandy CLAY; High plasticity, g orange/brown iron stained pocke grained sand, and some silt and	rey with ets, fine to medii	um						-
					-			grained sand, and some sin and	10013.							-
				_	2.0								×			-
		┢	ASS	-												-
					-											-
	_				2.5		1	Test pit CTP19 terminated at 2.5	m					CTP1	19 Terminated a	-
					-			Test pit CTF 19 terminated at 2.3	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					stead	ly progress	
					-											-
					3.0											_
Skeich																
method N na X ex BH ba B bu R rip E ex	atural xisting ackho ulldoz pper xcava	expo exc e bu er bla	avation cket ade	si S pi 1 W V	shoring enetratio 2 3 4 ater water - on dat	no resist ranging refusal level e show inflow	N nil ance to	notes, samples, tests U ₅₀ undisturbed sample 50mr U ₆₃ undisturbed sample 63mr D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	n diameter s b diameter f m D M V V V V	classifica coil desc assed on cystem noisture o dry A mo V wel V wel V p pla: V _L liqu	ation sy ription unified ist ist t stic limit id limit	mbols a classifica	nd tion	CO VS S F VS H Fb VL L MI D	nsistency/densii S very soft firm stiff St very hard friabl . very loose D medi dens	y index soft stiff e loose e um dense e

TESTPIT ENAUWOLL04006AA - LOGS.GPJ COFFEY.GDT 29.7.11



oof	Ŧ,				<u>av</u> i	ro	omente					
COI	IE	 Эу		CI	IVI				E	Excava	tion No	D. CTP20
Engiı	ne	erin	g L	-00	J -	Ex	cavation		9 (Sheet Office J	lob No.	1 of 1 :: ENAUWOLL04006AA
Client:		MAI	NILC	ORA (GRO	UP			[Date st	arted:	4.5.2011
Principal:									[Date co	mplete	ed: 4.5.2011
Project:		CON	NTA	MIN,	ASS	6, GE	OTECH + GWATER ASSESSME	INT	L	ogged	by:	CA
Fest pit loca	ation:	PRC	PO	SED	GAS	S PIP	ELINE, BOMADERRY, NSW, 254	41	(Checke	ed by:	SM
equipment typ	pe and	I model:	7T CA	T BACI	KHOE		Pit Orientation: E-W Easting:	2815	12 m		R.	L. Surface: NOT MEASURED
excavation di	mensi n info	ons: ormation	1.5m I	ong	mat	erial s	ubstance	6143	395 m	1	da	atum: WGS84 (Approx)
etration		notes			log	ation	material		θĒ	ency/ index	ocket enetro- eter	structure and
bene pene 1 5 3	water	tests, etc	RL I	depth metres	graphic	classific symbol	soil type: plasticity or particle characteristics colour, secondary and minor components.	s,	moistur conditio	consiste density	4 ق ق kPa وو 20 00 00	additional observations
	1			-			TOPSOIL; CLAY: Medium plasticity, brown, wi some silt and roots, and a trace of fine to medius grained sand.	ith Im	<wp< td=""><td>F</td><td></td><td>TOPSOIL</td></wp<>	F		TOPSOIL
		E		0.5		СН	CLAY: High plasticity, dark grey/black with son pale orange/pale brown iron stained pockets, with	ne ith	Wp	St/VSt		
		ASS		-			some slit, roots and tine to medium grained sand	α.			×	-
				-							×	_
		ASS	-	1. <u>0</u>								
												-
	flow)			1.5		СН	Sandy CLAY: High plasticity, grey with orange/brown pockets, fine to medium grained s	sand,	>Wp	F/St		-
	not inf	ASS		-			with some roots and silt.					
	bage (-							×	-
	See			2. <u>0</u>							×	-
				-							×	-
				-								-
				2.5			Test pit CTP20 terminated at 2.5m				<u>^</u>	CTP20 Terminated at 2.5m on
												steady progress -
				20								-
Sketch				3.0								
method N nati X exis BH bac B bull R ripp E exc	ural ex sting ex khoe b ldozer l ber :avator	posure acavation uucket blade	su S pe M wa	pport shoring <u>netratio</u> <u>2 3 4</u> <u>ater</u> water I • on date • water I water I	N no resista anging t efusal evel e shown nflow putflow	I nil ance o	notes, samples, tests c U ₅₀ undisturbed sample 50mm diameter b U ₆₃ undisturbed sample 63mm diameter b D disturbed sample b V vane shear (kPa) m Bs bulk sample m R refusal M V v v V vane shear (kPa) m V v v Bs bulk sample m V v v V v v V v v	classificat soil description vased on u system noisture O dry M moist N wet Np plas NL liqui	ion sy iption Inified st tic limit d limit	mbols a classifica	nd tion	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

			<image/>
drawn	RB		client: MANILDRA GROUP PTY LTD
approved	CA	coffev	project: ACID SULFATE SOIL, CONTAMINATION AND GEOTECHNICAL INVESTIGATION
date	19/07/2011	environments	PROPOSED GAS PIPELINE BOMADERRY NSW
scale	NTS	SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE	E title: PHOTO OF TEST PIT CTP20
original size	A4		project no: ENAUWOLL04006AA-AA Photo Plate: 24
5120			

oof	f,			P	nvi	ro	oments							
COI	It	Эу		CI	IVI				E	xcava	tion N	0.	CTP21	
Engir	ne	erin	gl	_00	J -	Ex	cavation		S	Sheet Office J	lob No	1 p.:	of 1 ENAUWOLL040)6AA
Client:		MAI	VILE	ORA	GRO	UP			0	Date st	arted:		4.5.2011	
Principal:									0	Date co	mplet	ed:	4.5.2011	
Project:		CON	VTA	MIN,	ASS	5, GE	OTECH + GWATER ASSESSMEN	NT	L	ogged	by:		СА	
Test pit loca	ation:	PRC)PO	SED	GAS	S PIP	ELINE, BOMADERRY, NSW, 254	1	C	Checke	d by:		SM	
equipment typ	be and	d model:	7T CA	AT BAC	KHOE		Pit Orientation: E-W Easting:	28116	62 m		F	R.L. S	urface: NOT MEASURE	D
excavation dir	nensi	ons:	1.5m	long	0.45m	wide orial s	Northing:	61434	135 m		d	atum	: WGS84 (Appro>)
					mat	ç				/×	ç t			
method 5 penetrat support	water	notes samples, tests, etc	RL	depth metres	graphic log	classificatio symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.		condition	consistency density inde	200 kb pocke	100 meter	structure and additional observation	S
W N		E	-	-			FILL; Sandy Gravelly CLAY: Low plasticity, brow fine to coarse grained sandstone and basalt grave with some roots.	wn, < el,	Wp	VSt		Т	OPSOIL FILL	-
		ASS	-	0.5		СН	CLAY: High plasticity, brown/orange, with some fine roots and some fine to medium grained sand, with a trace of silt.	,		Н	 >	Ā		-
	IVED			1. <u>0</u>						St/VSt	×			-
	NE OBSER	ASS	-	-		CL	Sandy CLAY: Medium plasticity, mottled orange/brown/grey, with a trace of fine roots and f to medium grained ironstone gravel.	fine		VSt	×			-
	Q			1. <u>5</u>										
				2.0						ц		×		-
				-										-
				2.5			Test pit CTP21 terminated at 2.5m					C	TP21 Terminated at 2.5m o teady progress	ר - -
				3.0										-
method N natı X exis BH bac B bull R ripp E exc	ural ex sting ex khoe b dozer l er avator	posure ccavation bucket blade	sis s pi₁ ₩ ₩ ►	apport shoring 2 3 4 ater water 1 - on dat - water 1 water 1 water 1	N no resista ranging to refusal level e showr inflow outflow	nil ance o	notes, samples, tests classify U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample R refusal M W W Wp	issificati il descrij sed on ur stem bisture dry moist wet p plasti liquic	t t t t t t t t t t t t t t t t	mbols a	nd tion		consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense	

drawn	RB		Client:		MANILDRA GRO	UP PTY LTD
approved	CA	coffey	project: AC	D SULFATE	SOIL, CONTAMIN	ATION AND GEOTECHNICAL
date	19/07/2011	environments			PROPOSED GAS BOMADERR	S PIPELINE LY NSW
scale	NTS	SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE	title:		PHOTO OF TEST	F PIT CTP21
original size	A4		project no:	ENAUWOLL0	4006AA-AA	Photo Plate: 25

~		۶,					iro	amonte								
CC	וו	It	≯y		EI	IV				E	Excava	tion No	Э.	CTP2	2	
Eng	gir	e	ering	g I	Log) -	Ex	cavation		(Sheet Office J	lob No	1 c .:	of 2 ENAU	WOLL0400	<u>)6AA</u>
Client:			MAI	VILL	DRA	GRC	DUP			[Date st	arted:		4.5.20	11	
Principa	al:									[Date co	omplete	ed:	4.5.20	11	
Project:			CON	VTA	MIN,	ASS	S, GE	OTECH + GWATER ASSESS	MENT	L	ogged	l by:		CA		
Test pit	loca	tion:	PRC	PO	SED	GA	S PIP	ELINE, BOMADERRY, NSW,	2541	C	Checke	ed by:		SM		
equipme	nt type	e and	model:	7T C/	AT BAC	KHOE		Pit Orientation: E-W Easti	ng: 280	0967 m		R.	.L. Sur	face: N	NOT MEASURE	D
excavatio	on dim	ensi	ons:	2.5m	long	0.45m	wide	North	ing: 614	13645 m	1	da	atum:	١	NGS84 (Approx)
excava	ation	info	ormation			ma	terial s	ubstance			ž	Å				
method penetratio	support	water	notes samples, tests, etc	RL	depth	graphic log	classification symbol	material soil type: plasticity or particle characte colour, secondary and minor compon	ristics, ents.	moisture condition	consistency/ density index	00 A pocket		stru addition	ucture and al observation:	5
— 12 Ш	N		E					TOPSOIL; CLAY: Medium to high plastici brown, with some silt and roots.	iy,	Wp	F/St	30 20	TO	PSOIL		
					0.5		СН	CLAY: Medium to high plasticity, brown, wand roots.	vith silt	Wp/>Wp	VSt	×	ALL	UVIAL SC		
							СН	CLAY: High plasticity, orange/brown, with fine to medium grained sand and silt, with a roots.	some a trace of	Wp		×				-
		VED			1. <u>0</u> –							×				
		VE OBSER			1. <u>5</u>		CL	Sandy Gravelly CLAY: Low to medium pl mottled orange/brown, red/brown, grey and fine to coarse grained sub-angular latite gra to medium grained sand, with some sub-ro	asticity, l yellow, avel, fine unded	<wp< td=""><td>Н</td><td>60</td><td>99₄</td><td></td><td></td><td>-</td></wp<>	Н	60	99 ₄			-
		ION			-			latite cobbles, and a trace of fine roots.								-
					2.0											
					2. <u>5</u>											-
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CC)T	TE	ЭУ		e	nvi	ror	nments		-	Excava	ation N	۱o.	СТР	22	
End	air	e	erin	a l	_00	1 -	Ex	cavation			Sheet		2	of 2		~ • •
Client [.]	<u>J</u>		MAI			, GRO					Office	Job N arted	0.:	ENA 4.5.2	0WOLL04000	<u>6AA</u>
Principa	al:						•				Date co	omple	ted:	4.5.2	2011	
Proiect	:		cor	VTA	MIN.	ASS	6. GE	OTECH + GWATER AS	SESSME	NT	Loaaed	d bv:		CA		
Test pit	t loca	tion:	PRO	PO	SED	GAS	S PIP	ELINE, BOMADERRY,	NSW, 254	1	Checke	ed by:		SM		
equipme	ent type	e and	l model:	7T CA	AT BACI	KHOE		Pit Orientation: E-W	Easting:	280967 m		-	R.L. S	urface:	NOT MEASURED)
excavati	ion dim	iensi	ons:	2.5m	long	0.45m	wide	ubstanco	Northing:	6143645 (n		datum	:	WGS84 (Approx)	
excav			mation			mai		ubstance			×ex	r t t				
method 1 2 penetrat	support 3	water	notes samples, tests, etc	RL	depth metres	graphic log	classificatic symbol	material soil type: plasticity or particle colour, secondary and mino	characteristics, r components.	moisture condition	consistency density inde	200 A penet	400 meter	addit	structure and ional observations	
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method				51	Ipport			notes, samples, tests	cli	assification	vmbols =	and		consiste	ncv/density index	\square
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BH B	back bulld	hoe b ozer b	ucket blade	ре 1	enetratio	n no resist:	ance	D disturbed sample V vane shear (kPa)	sy	stem				F St	firm stiff	
к Е	rippe exca	r vator			ing in the second secon	anging t	0	Bs bulk sample E environmental sample B refueat	m D	dry moist				VSt H Fb	very stiff hard friable	
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drawn RB approved CA date 19/07/2011 scale NTS original A4			<image/>		
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approved CA approved CA date 19/07/2011 scale NTS original A4	drawn	RB		client: MANILDRA GROU	UP PTY LTD
date 19/07/2011 PROPOSED GAS PIPELINE BOMADERRY NSW scale NTS SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE title: original aizo A4 Project no: ENAUWOLL04006AA-AA	approved	СА	coffey	project: ACID SULFATE SOIL, CONTAMINA INVESTIGA	ATION AND GEOTECHNICAL
scale NTS SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE title: PHOTO OF TEST PIT CTP22 original aiza A4 project no: ENAUWOLL04006AA-AA Photo Plate: 26	date	19/07/2011	environments	PROPOSED GAS BOMADERR	S PIPELINE Y NSW
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	original size	A4		project no: ENAUWOLL04006AA-AA	Photo Plate: 26

coffey *	enviro	nments		-	Excava	ition No.	СТР23
Engineering Lo	g - Ex	cavation			Sheet Office 、	Job No.:	1 of 1 ENAUWOLL04006AA
Client: MANILDRA Principal:	A GROUP				Date st Date co	arted: ompleted	4.5.2011 ± 4.5.2011
Project: CONTAMI Test pit location: PROPOSE	N, ASS, GE D GAS PIP	OTECH + GWATER AS ELINE, BOMADERRY,	SSESSMEN NSW, 2541	Т	Loggec Checke	l by: ed by:	CA SM
equipment type and model: 7T CAT B.	ACKHOE	Pit Orientation: E-W	Easting:	280856 m	_	R.L	. Surface: NOT MEASURED
excavation dimensions: 2.3m long excavation information	material s	substance	Northing:	6143748 r	n	dati	um: WGS84 (Approx)
notes amples, amples, amples, amples, amples, tests, etc dej tests, etc dej RL meti	8 th graphic log classification symbol	material soil type: plasticity or particle colour, secondary and minoi	characteristics, r components.	moisture condition	consistency/ density index	00 y pocket 200 d penetro- 100 meter	structure and additional observations
IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII		TOPSOIL; CLAY: Medium to hig brown, wtih some silt and roots, w medium grained sand. CLAY: Medium to high plasticity some silt and roots. CLAY: High plasticity, brown with stained orange/brown pockets, wi trace of roots and fine to medium Sandy CLAY: Medium plasticity, orange/brown, brown and dark gre to medium grained angular ironsto trace of fine roots. Test pit CTP23 terminated at 2.5n	h plasticity, ith a trace of fine , brown, with h some iron th some silt, with grained sand. mottled grey, ey, with some fine one gravel, and a n	to a a Wp	St/VSt	X X X	TOPSOIL
Sketch method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator water Image: Support Image: Support	t ng N nil 4 no resistance ranging to 3 refusal er level date shown er inflow	notes, samples, tests U ₅₀ undisturbed sample 50mm U ₆₃ undisturbed sample 63mm D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	diameter diameter diameter D M W Wp WL	sification s description d on unified am sture dry moist wet plastic lim liquid limit	ymbols a classifica it	nd	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense

drawn RB Client: MANILDRA GROUP PTY LTD	
approved CA project: ACID SULFATE SOIL, CONTAMINATION AND GEOTE	CHNICAL
date 19/07/2011 environments PROPOSED GAS PIPELINE BOMADERRY NSW	
scale NTS SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE title: PHOTO OF TEST PIT CTP23	
original A4 project no: ENAUWOLL04006AA-AA Photo Plate: 27	

CC	of	fe	ev	2	e	nv	iro	nments			_	Evcava	tion No		D0 4	
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Eng	gir		erin	gl	<u>_0(</u>] -	EX	cavation			(Sheet Office J	lob No.	: EN /	AUWOLL04	006AA
Client:			MAI	NILI	DRA	GRC	DUP				I	Date st	arted:	4.5.2	2011	
Principa	al:										I	Date co	omplete	ed: 4.5. 2	2011	
Project:			COI	NTA	MIN,	ASS	S, GE	OTECH + GWATE	R ASSESSN	<i>IENT</i>	l	_ogged	l by:	CA		
Test pit	locat	ion:	PRO		SED	GA	S PIP	ELINE, BOMADER	2RY, NSW, 2	2541	(Checke	ed by:	SM		
equipmei	nt type on dim	e and ensid	I model:	1 5m	AT BAC	KHOE 0 45m	wide	Pit Orientation: E-W	Easting	g: 280	0808 m 43805 m	h	R. da	L. Surface:	WGS84 (Apr	
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ration			notes			bo	ation	mat	erial			ncy/ ndex	cket netro- ster		atructure and	
thod	port	ter	samples, tests, etc		denth	phic I	ssifice	soil type: plasticity or r	narticle characteris	tics	isture	nsister nsity ii	ĕ₫≝ kPa	addi	tional observat	ions
۳ 12	3 Ins	wa		RL	metres	gra	syr	colour, secondary an	d minor componer	nts.	ÊŌ		100 200 300 400	TODSON		
ш	N				-			brown, wtih some silt and r	n to high plasticity, oots, with a trace of medium grained se	of fine	<vvp td="" vv<=""><td>s St</td><td></td><td>TOPSOIL</td><td></td><td>-</td></vvp>	s St		TOPSOIL		-
			E	-	-		CL	CLAY: Medium plasticity,	pale orange/pale	brown,	Wp	н			SOIL	
					0. <u>5</u>			with some silt and fine to m a trace of roots.	edium grained sar	nd, and			×			
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					-		CL	Sandy CLAY: Medium pla grey, orange/brown and br	asticity, mottled da own, with a trace c	irk of fine	1	Н		×		-
								roots and fine to medium g gravel.	rained angular iror	nstone						-
					2.0											
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				-	2.5	/////		Test pit CTP24 terminated	at 2.5m					CTP24 Te	erminated at 2.5r	n on _
					-									steady pro	Jyress	-
																-
Sketc	h				3.0							1				
method				s	upport			notes, samples, tests	t	classifi	cation sy	/mbols a	nd	consist	ency/density inde	x
N X	natur exist	al exp ng ex	cavation	S	shoring	1	N nil	U ₅₀ undisturbed sample U ₆₃ undisturbed sample	e 50mm diameter e 63mm diameter	soil des based o	cription n unified	classifica	ation	VS S	very soft soft	
BH B	back bulld	noe b ozer b r	ucket plade	p 1	enetratic 2 3 4	on no resist	ance	D disturbed sample V vane shear (kPa)	F	system				F St	firm stiff	
к Е	rippe exca	ı vator				ranging refusal	to	E environmental sam	ıple	D di	e ry voist			H	very stiff hard	
					water	level	'n	is reiusai		Wn n	iuisi et lastic limi	t		VL I	very loose	
					- water	inflow	11			W _L lie	quid limit	•		MD	medium de	nse
					water	outflow		1						VD	verv dense	

TESTPIT ENAUWOLL04006AA - LOGS.GPJ COFFEY.GDT 29.7.11



Excavation No. CTP25 Engineering Log - Excavation Sheet 1 of 1 Office Job No.: ENAUWOLLO. Client: MANILDRA GROUP Date started: 4.5.2011 Principal: Date completed: 4.5.2011 Project: CONTAMIN, ASS, GEOTECH + GWATER ASSESSMENT Logged by: CA Test pit location: PROPOSED GAS PIPELINE, BOMADERRY, NSW, 2541 Checked by: SM equipment type and model: 7T CAT BACKHOE Pit Orientation: E-W Easting: 280550 m R.L. Surface: NOT MEAS excavation dimensions: 1.5m long 0.45m wide Northing: 6144015 m datum: WGS84 (Ap pogu ugged by: tots soil type: plasticity or particle characteristics, colour, secondary and minor components. origin of additional observal structure and additional observal pogu ugged by: totage of additional observal soil type: plasticity or particle characteristics, colour, secondary and minor components. additional observal	4006A <i>F</i>
Engineering Log - Excavation Sheet of 1 of 1 Office Job No.: 1 of 1 ENAUWOLLO. Client: MANILDRA GROUP Date started: 4.5.2011 Principal: Date completed: 4.5.2011 Project: CONTAMIN, ASS, GEOTECH + GWATER ASSESSMENT Logged by: CA Test pit location: PROPOSED GAS PIPELINE, BOMADERRY, NSW, 2541 Checked by: SM equipment type and model: 7T CAT BACKHOE Pit Orientation: E-W Easting: 280550 m R.L. Surface: NOT MEASI excavation dimensions: 1.5m long 0.45m wide Northing: 6144015 m datum:< WGS84 (Ap upguing updue data notes samples, tests, etc. of yig tests o	4006AA
Client: MANILDRA GROUP Date started: 4.5.2011 Principal: Date completed: 4.5.2011 Project: CONTAMIN, ASS, GEOTECH + GWATER ASSESSMENT Logged by: CA Test pit location: PROPOSED GAS PIPELINE, BOMADERRY, NSW, 2541 Checked by: SM equipment type and model: 7T CAT BACKHOE Pit Orientation: E-W Easting: 280550 m R.L. Surface: NOT MEAS excavation dimensions: 1.5m long 0.45m wide Northing: 6144015 m datum: WGS84 (Ap vigt notes anderial substance soil type: plasticity or particle characteristics, colour, secondary and minor components. unitype of the appendic of t	
Principal: Date completed: 4.5.2011 Project: CONTAMIN, ASS, GEOTECH + GWATER ASSESSMENT Logged by: CA Test pit location: PROPOSED GAS PIPELINE, BOMADERRY, NSW, 2541 Checked by: SM equipment type and model: 7T CAT BACKHOE Pit Orientation: E-W Easting: 280550 m R.L. Surface: NOT MEASI excavation dimensions: 1.5m long 0.45m wide Northing: 6144015 m datum: WGS84 (Ap vigting type and type and type and model: 1.5m long 0.45m wide material soil type: plasticity or particle characteristics, tests, etc. material Soil type: plasticity or particle characteristics, cloup, secondary and minor components. Integrad additional observal	
Project: CONTAMIN, ASS, GEOTECH + GWATER ASSESSMENT Logged by: CA Test pit location: PROPOSED GAS PIPELINE, BOMADERRY, NSW, 2541 Checked by: SM equipment type and model: 7T CAT BACKHOE Pit Orientation: E-W Easting: 280550 m R.L. Surface: NOT MEASI excavation dimensions: 1.5m long 0.45m wide material Northing: 6144015 m datum: WGS84 (Ap origin to the samples, tests, etc Motes samples, tests, etc Soil type: plasticity or particle characteristics, colour, secondary and minor components. Notes samples, tests, etc Methy to the samples, colour, secondary and minor components.	
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Notes Notes Solution Solution 1223 additional observation tests, etc. depth RL metres boold column at column column at column solution solutio	prox)
ite notes of oit material of oit structure and population ites samples, itests, etc depth	
	tions
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E 0.5 0.1 CERT ingriplication, norm, will come sine and a property for the contraction of	
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	-
L CL Sandy CLAY: Medium plasticity, mottled dark grey, orange, red/brown and yellow, with a trace of	
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	_
	-
	-
Z.5 Z.5 <td>im on</td>	im on
- Steady progress	-
	-
Sketch	
method support notes, samples, tests classification symbols and consistency/density ind	lex
N Inatural explosure S shoring N min U ₅₀ Uninstructed sample dominitier Soil description VS Very Soil X existing excavation U ₆₃ undisturbed sample 63mm diameter based on unified classification S soft BH backhoe bucket penetration D disturbed sample 63mm diameter system F firm	
B bulldozer blade 1 2 3 4 0 resistance Bs bulk sample 5,000 St stiff ranging to Bs bulk sample VSt very stiff	
E excavator water R refusal D dry H hard water R refusal M moist Fb friable	
water level VL very loose Vp plastic limit L loose	
water inflow WL liquid limit MD medium de D dense	ense



CC	f	f¢		2	e	nvi	ro	nments			_						
			<i>y</i>								E	xcava	tion N	0.	CTF	26	
Enç	gir	e	erin	g L	-00	J -	Ex	cavation			S	Sheet Office J	ob No	1 .:	of 1 ENA	UWOLL040	06AA
Client:			MAI	NILD	RA (GRO	UP				0	Date st	arted:		4.5.2	011	
Principa	al:										0	Date co	mplet	ed:	4.5.2	011	
Project:			COI	ITA	MIN,	ASS	5, GE	OTECH + GWATER AS	SESSME	ENT	L	.ogged	by:		CA		
Test pit	loca	ion:	PRC)PO	SED	GAS	S PIP	ELINE, BOMADERRY,	NSW, 25	41	C	Checke	d by:		SM		
equipmer	nt type	e and	I model:	7T CA	T BAC	KHOE	ماماني	Pit Orientation: E-W	Easting:	2803	330 m		R	.L. Su	urface:	NOT MEASURI	ED
excavation excavation	ation	info	ormation	1.5m l	ong	mat	erial s	ubstance	Northing:	6144	4221 m		d	atum:		WGS84 (Appro	()
ation			notes			bo	tion	material				icy/ idex	ket ietro-	D.			
method 5 penetr	support	water	samples, tests, etc	RL r	depth metres	graphic lo	classificat symbol	soil type: plasticity or particle colour, secondary and mino	characteristic or components	:S,	moisture condition	consisten density in	kPa		s additi	structure and onal observatior	IS
Ш	N		E	-	-			FILL; Sandy Gravelly CLAY: Me brown, fine to coarse grained ang fine to coarse grained sand, and s	edium plasticit jular basalt/silt some roots.	y, tstone,	<wp< td=""><td>VSt</td><td>×</td><td>FI</td><td>LL: ROAI</td><td>D SHOULDER</td><td></td></wp<>	VSt	×	FI	LL: ROAI	D SHOULDER	
			E	-	0.5												-
		0			-		CL/CH	CLAY: Medium to high plasticity orange/brown and grey, with som grained sand, and a trace of fine t angular ironstone gravel and silt.	, mottled e fine roots ar to medium gra	nd fine ained			×	Āİ		SOIL	
		DBSERVEI	E	-	1.0								×				
		NONE			1. <u>5</u>		CL	Sandy CLAY: Medium plasticity, grey, orange, red/brown and yellc fine roots.	, mottled dark w, with a trace	e of		Н		×			-
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					2.5			Test pit CTP26 terminated at 2.5r	n					C ste	TP26 Ter eady prog	minated at 2.5m c gress	- n _ _
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Sketc	h				3.0												
method N X BH B R E	natu exist back bulld rippe exca	ral exp ing exp hoe b ozer b r vator	coosure icavation ucket olade	suj sei pei wa wa	pport shoring 2 3 4 ter water on dat	N no resista ranging to refusal level e showr inflow outflow	nil Ince	notes, samples, tests U _{s0} undisturbed sample 50mm U _{s0} undisturbed sample 63mm D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	diameter diameter s	classifica soil desc based on system moisture D dry M mo W we Wp pla W _L liqu	ation sy ription unified of ist t stic limit	mbols a	nd tion		consister VS F St VSt H Fb VL L MD D VD	ncy/density index very soft soft firm stiff very stiff hard friable very loose loose medium dense dense very dense	



Appendix D Results of Soil Vapour Testing

ACID SULFATE SOIL, CONTAMINATION AND GEOTECHNICAL INVESTIGATION BOMADERRY NSW ACN 090 522 759 ABN 45 090 522 759

Photoionisation Detector Results



job no.: ENAUWOLL 04006AA

Client:	MANILDRA GR	JUP				Office:	Office: WOLLONGONG Date: 4/05/2011 and 14/06/2011 MBy: CA				
Principal:						Date:	4/05/2011 and 14/06/2011				
Location:	PROPOSED G/	AS PIPELINE,	BOMADERR'	ID SULFATE SC Y. NSW 2541	JIL ASSESSIVI	ву: Checked by:	CA				
PID Serial N	umber:	MINI RAE 2000	110-008460			Lamp Voltage:	10.6eV				
Last checked	d/calibrated:					0ppm Calibratior	ก:				
Calibration g	jas type/concent	tration:	Isobutylene/1	00ppm		100ppm Calibrat	ion:				
Location Number	Test	Bore or sample probe depth (m)	Duration (mins)	Background Reading (ppm)	last reading (ppm)	Maximum Reading (ppm)	Notes				
CTP26	HS	0.1-0.2	1	0.0	0.6	9.5	No odour/no staining				
CTP26	HS	1.0-1.1	1	0.0	0.4	0.7	No odour/no staining				
CTP25	HS	0.3-0.4	1	0.4	0.4	0.4	No odour/no staining				
CTP24	HS	0.2-0.3	1	0.0	0.2	0.3	No odour/no staining				
CTP23	HS	0.3-0.4	1	0.0	0.1	0.1	No odour/no staining				
CTP22	HS	0.1-0.2	1	0.0	0.0	0.0	No odour/no staining				
CTP21	HS	0.1-0.2	1	0.0	0.2	0.2	No odour/no staining				
CTP20	HS	0.2-0.3	1	0.0	1.2	1.5	No odour/no staining				
CTP19	HS	0.2-0.3	1	0.0	0.2	0.2	No odour/no staining				
CTP18	HS	0.2-0.3	1	0.0	0.1	0.2	No odour/no staining				
SS03	HS	0.0-0.1	1	0.0	0.8	5.3	No odour/no staining				
SS06	HS	0.0-0.1	1	0.0	4	8	No odour/no staining				
SS15	HS	0.0-0.1	1	0.2	6	7.7	No odour/no staining				
SS11	HS	0.0-0.1	1	0.0	1.4	4.7	No odour/no staining				
SS08	HS	0.0-0.1	1	0.0	1.5	3	No odour/no staining				
SS16	HS	0.0-0.1	1	0.0	1.4	1.4	No odour/no staining				
SS10	HS	0.0-0.1	1	0.0	1.3	1.5	No odour/no staining				
SS05	HS	0.0-0.1	1	0.0	3	3	No odour/no staining				
SS17	HS	0.0-0.1	1	0.0	1.2	2	No odour/no staining				
SS04	HS	0.0-0.1	1	0.0	1.5	1.7	No odour/no staining				
SS12	HS	0.0-0.1	1	0.0	0.6	0.7	No odour/no staining				
SS09	HS	0.0-0.1	1	0.0	0.4	0.6	No odour/no staining				
SS13	HS	0.0-0.1	1	0.0	0.9	1	No odour/no staining				
SS14	HS	0.0-0.1	1	0.0	1	1.3	No odour/no staining				
SS07	HS	0.0-0.1	1	0.0	1.4	1.4	No odour/no staining				
SS02	HS	0.0-0.1	1 1	0.0	0.5	0.6	No odour/no staining				

*Fill in the test type as follows:-

BH () = soil gas probe sample

HS () = headspace sample

ACN 090 522 759 ABN 45 090 522 759

Photoionisation Detector Results



job no.: ENAUWOLL 04006AA

Client:	MANILDRA GRO	OUP				Office:	WOLLONGONG
Principal:						Date:	4/05/2011 and 14/06/2011
Project:	CONTAMINATIO	ON, GEOTECHN	ICAL AND AC	ID SULFATE SO	DIL ASSESSM	By:	CA
Location:	PROPOSED GA	AS PIPELINE,	BOMADERRY	Y, NSW 2541		Checked by:	
PID Serial Nu	ımber:	MINI RAE 2000	110-008460			Lamp Voltage:	10.6eV
Last checked	l/calibrated:					Oppm Calibration	1:
Calibration g	as type/concent	tration:	Isobutylene/1	00ppm		100ppm Calibrat	ion:
Location Number	Test	Bore or sample probe depth (m)	Duration (mins)	Background Reading (ppm)	last reading (ppm)	Maximum Reading (ppm)	Notes
SS01	HS	0.0-0.1	1	0.0	0.8	0.8	No odour/no staining

Appendix E Laboratory Reports – Chemical Testing

ACID SULFATE SOIL, CONTAMINATION AND GEOTECHNICAL INVESTIGATION BOMADERRY NSW

TABLE E1: SUMMARY OF LABORATORY RESULTS FOR SOIL SAMPLES

Heavy Metals, TPH, BTEX, PAH, OCP, OPP, PCB and Asbestos

(All results in mg/kg)

O-mula ID			0004	0000	0000	(Duplicate of SS03/0.0-	0004	0005	0000	0011	0010	0045	0017	OTDIA	OTDOO	OTDO	OTDOD	OTDOS	OTDOG	(Duplicate of CTP26/0.4-	0000	0004	0000	0000	0004
Sample ID Madia	-		SS01	SS02	SS03	0.1m)	SS04	SS05	SS06	SS11	SS12	SS15	SS17	CIP19	CTP20	CTP21	CTP23	CTP25	CTP26	0.5m)	SS30	SS31	SS32	SS33	SS34
Date of Sampling	HIL (NEHE E)	FII	09-Jun-11	09lun-11	09-Jun-11	09-Jun-11	09-Jun-11	09-Jun-11	09-Jun-11	09-Jun-11	09-Jun-11	09-Jun-11	09-Jun-11	04-May-11	04-May-11	04-May-11	04-May-11	04-May-11	04-May-11	04-May-11	25-Jul-11	25-Jul-11	25-Jul-11	25-Jul-11	25-Jul-1
Unit			Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Depth (m)	-		0.0m - 0.10m	0.0m - 0.10m	0.0m - 0.10m	0.0m - 0.10m	0.0m - 0.10m	0.0m - 0.10m	0.0m - 0.10m	0.0m - 0.10m	0.0m - 0.10m	0.0m - 0.10m	0.0m - 0.10m	0.2-0.3	0.2-0.3	0.1-0.2	0.3-0.4	0.3-0.4m	0.4-0.5m	0.4-0.5m	0.0m - 0.10m	0.0m - 0.10m	0.0m - 0.10m	0.0m - 0.10m	0.0m - 0.10
HEAVY METALS																									L
Arsenic	500 ¹	20 1	<3	4	3	<3	4	3	17	4	4	4	4	4	4	4	<3	5	<3	3	-	-	-	-	
Cadmium	100 ¹	3 1	<0.3	<0.3	0.5	0.4	<0.3	<0.3	0.8	<0.3	<0.3	<0.3	<0.3	0.3	0.3	0.4	0.3	0.4	<0.3	<0.3	-	-	-	-	
Chromium	600,000 ^{1a}	400 ^{1a}	22	50	26	11	14	18	30	14	18	12	16	17	21	17	11	22	9.3	9.8	-	-	-	-	
Copper	5,000 ¹	100 ¹	82	110	13	11	25	54	31	3	35	26	36	21	8.5	56	12	7.8	13	15	-	-	-	-	
Lead	1,500 ¹	600 ¹	17	17	65	76	25	22	16	8	34	28	17	14	11	97	13	10	9.7	9.9	-	-	-	-	
Nickel	3,000 ¹	60 ¹	6.4	17	1.2	1	4.3	5.8	9.5	1.1	7.5	7.6	8.6	9.3	3.2	4.4	4.7	2.5	7.4	11	-	-	-	-	
Zinc	35,000 ¹	200 1	96	110	72	43	45	62	89	12	70	130	100	54	19	63	27	17	31	42	-	-	-	-	
Mercury	75 ^{1b}	1 ¹¹	< 0.05	<0.05	0.16	0.16	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	
TOTAL PETROLEUM HYDROCARBONS																									
C6 - C9 Fraction	65 ²		<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	-	-	-	-	-
C10 - C14 Fraction			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	-	-	-	-	
C15 - C28 Fraction			<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	-	-	-	-	
C29 - C36 Fraction			<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	-	-	-	-	
Total C10-C36	1,000 ²		<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td></td></lor<></td></lor<>	<lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td></td></lor<>	-	-	-	-	
BTEX																									
Benzene	1 2		<01	<0.1	<01	<01	<01	<0.1	<01	<01	<0.1	<01	<01	<01	<0.1	<01	<01	<0.1	<01	<01	-	_			-
Toluene	130 ²		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-
Ethylbenzene	50 ²		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		_		-	-
Total Xylene	25 ²		<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3				-	
POLYCYCLIC AROMATIC HYDROCARB	ONS																								
Benzo(a)pyrene	51		<0.1	<0.1	<01	<01	<01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<01	<0.1	<0.1	<0.1	-	-	-	-	-
Total PAH	100 ¹		<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<>	<lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<>	-	-	-	-	-
																									l
Heptachlor	50 ¹		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-
Chlordane	250 ¹		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	< 0.2	< 0.2	<0.2	<0.2	<0.2	-	-	-	-	-
Aldrin + Dieldrin	50 ¹		<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<>	<lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<>	-	-	-	-	-
DDT + DDE + DDD	1.000 ¹		<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<></td></lor<>	<lor< td=""><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></lor<>	-	-	-	-	-
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ORGANOPHOSPHOROUS PESTICIDES																									
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POLYCHLORINATED BIPHENYLS	+				·	····	+		· · · · · · · · · · · · · · · · · · ·				· · · · · · · · · · · · · · · · · · ·		+		+					····			<u> </u>
Total PCB	50 ¹		<lor< td=""><td><lor< td=""><td></td><td></td><td>-</td><td></td><td></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td></td><td></td><td>-</td><td></td><td></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td></td><td></td><td>-</td><td></td><td></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td></td><td></td><td>-</td><td></td><td></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td></td><td></td><td>-</td><td></td><td></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td></td><td></td><td>-</td><td></td><td></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td></td><td></td><td>-</td><td></td><td></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td></td><td></td><td>-</td><td></td><td></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td></td><td></td><td>-</td><td></td><td></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td></td><td></td><td>-</td><td></td><td></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td></td><td></td><td>-</td><td></td><td></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td></td><td></td><td>-</td><td></td><td></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td></td><td></td><td>-</td><td></td><td></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td></td><td></td><td>-</td><td></td><td></td></lor<></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td><lor< td=""><td></td><td></td><td>-</td><td></td><td></td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td><lor< td=""><td></td><td></td><td>-</td><td></td><td></td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td></td><td></td><td>-</td><td></td><td></td></lor<></td></lor<>	<lor< td=""><td></td><td></td><td>-</td><td></td><td></td></lor<>			-		
	++			+	<u> </u>		1								1	Chrysotile						<u> </u>			
ASBESTOS	ND ³		ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	asbestos detected	ND	ND	ND	-	ND	ND	ND	ND	ND
NOTEO																									
NUTES: Bold	Concentration exce	eds the Human	Health Investiga	ation Levels (HII)																					
Bold	Concentration exce	eds the Environ	mental Investiga	ation Levels (EIL)																					

Concentration exceeds the Human Health Investigation Levels (HIL) Concentration exceeds the Environmental Investigation Levels (EIL) ¹ Based on NSW DEC (2006), Guidelines for the NSW Site Auditor Scheme 2nd Edition and NEPM (1999). ^a Based on Chromium III ^b Based on Inorganic Mercury ² Based on NSW EPA (1994), Guidelines for Assessing Service Station Sites ³ On the advice of the NSW Department of Health, the NSW EPA have advised NSW Site Auditors (Site Auditors Meeting 1 March 2000) that "no asbestos in the soil at the surface is permitted". The phrase 'at the surface' has not been defined.

The phrase 'at the surface' has not been defined. ND Not Detected

Not Analysed LOR Limits of Reporting See original laboratory reports for detection limits

F:\ENVI\WOLLONGONG\EAW04000-EAW04050\ENAUWOLL04006AA\Reports\ENAUWOLL04006AA-R01 Laboratory Results

TABLE E1: SUMMARY OF LABORATORY RESULTS FOR SOIL SAMPLES

Heavy Metals, TPH, BTEX, PAH, OCP, OPP, PCB and Asbestos

(All results in mg/kg)

<u> </u>							
Sample ID			SS35	SS36	SS37	SS38	SS39
Media			Soil	Soil	Soil	Soil	Soil
Date of Sampling	HIL (NEHF F)	EIL	25-Jul-11	25-Jul-11	25-Jul-11	25-Jul-11	25-Jul-11
Unit			Soil	Soil	Soil	Soil	Soil
Depth (m)			0.0m - 0.10m				
HEAVY METALS							
Arsenic	500 ¹	20 ¹	-	-	-	-	-
Cadmium	100 ¹	3 ¹	-	-	-	-	-
Chromium	600,000 ^{1a}	400 ^{1a}	-	-	-	-	-
Copper	5,000 ¹	100 ¹	-	-	-	-	-
Lead	1,500 ¹	600 ¹	-	-	-	-	-
Nickel	3,000 ¹	60 ¹	-	-	-	-	-
Zinc	35.000 ⁻¹	200 ¹	-	-	-	-	-
Mercury	75 ^{1b}	1 ^{1b}	-	-	-	-	-
morodry							
TOTAL PETROLEUM HYDROCARBONS							
C6 - C9 Fraction	65 ²		-	-	-	-	-
C10 - C14 Fraction			-	-	-	-	-
C15 - C28 Fraction			-	-	-	-	-
C29 - C36 Fraction			-	-	-	-	-
Total C10-C36	1,000 ²		-	-	-	-	-
втех							
Benzene	1 ²		-	-	-	-	-
Toluene	130 ²		_	-	-	-	-
Ethylbenzene	50 ²		-	_		-	
Total Xylene	25 2		-	-	-	-	-
POLYCYCLIC AROMATIC HYDROCARBO	NS						
Benzo(a)pyrene	51				-		
Total PAH	100 1			_			
	100						
ORGANOCHI ORINE PESTICIDES							
Hentachlor	50 ¹		-	_	-		-
Chlordono	250 1						
	230 50 ¹			-	-	-	-
	50		-	-	-		-
	1,000			-	-	-	-
Other OCP			-	-	-	-	-
ORGANOPHOSPHOROUS PESTICIDES							
Total OPP	-		-	-	-	-	-
T L LOOD							
I OTAI PCB	50 '		-	-	-	-	-
ASBESTOS	ND ³		ND	ND	ND	ND	ND
1	1			1		1	1

NOTES:

Bold Bold

Concentration exceeds the Human Health Investigation Levels (HIL) Concentration exceeds the Environmental Investigation Levels (EIL) ¹ Based on NSW DEC (2006), Guidelines for the NSW Site Auditor Scheme 2nd Edition and NEPM (1999). ^a Based on Chromium III ^b Based on Inorganic Mercury ² Based on NSW EPA (1994), Guidelines for Assessing Service Station Sites ³ On the advice of the NSW Department of Health, the NSW EPA have advised NSW Site Auditors (Site Auditors Meeting 1 March 2000) that 'no asbestos in the soil at the surface is permitted''. The phrase 'at the surface' has not been defined

The phrase 'at the surface' has not been defined. ND Not Detected

Not Analysed LOR Limits of Reporting See original laboratory reports for detection limits

F:\ENVI\WOLLONGONG\EAW04000-EAW04050\ENAUWOLL04006AA\Reports\ENAUWOLL04006AA-R01 Laboratory Results



ANALYTICAL REPORT

19 May 2011

Coffey Environments Pty Ltd

118 Auburn Street Wollongong **NSW 2500**

Attention:	Manuel Fernandez
------------	-------------------------

Your Reference: ENAUWOLL04006AA

Our Reference: SE87472 Samples: 15 Soils Received: 6/5/11

Preliminary Report Sent: Not Issued

These samples were analysed in accordance with your written instructions.

For and on Behalf of: SGS ENVIRONMENTAL SERVICES

Sample Receipt: **Production Manager:** Angela Mamalicos Huong Crawford

AU.SampleReceipt.Sydney@sgs.com Huong.Crawford@sgs.com

Results Approved and/or Authorised by:

Dong Liang Inorganic/Metal Superviso

Huong Crawford

Metals Signatory

Ravee Sivasubramaniam Asbestos Signatory

Ly Kim Ha

Organics Signatory Organics Signatory



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www.au.sgs.com

PROJECT: ENAUWOLL04006AA

BTEX in Soil						
Our Reference:	UNITS	SE87472-1	SE87472-2	SE87472-4	SE87472-6	SE87472-8
Your Reference		CTP26	QA01	CTP25	CTP23	CTP21
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth		0.4-0.5m	0.4-0.5m	0.3-0.4m	0.3-0.4	0.1-0.2
Date Sampled		4/05/2011	4/05/2011	4/05/2011	4/05/2011	4/05/2011
Date Extracted (BTEX)		13/05/2011	13/05/2011	13/05/2011	13/05/2011	13/05/2011
Date Analysed (BTEX)		13/05/2011	13/05/2011	13/05/2011	13/05/2011	13/05/2011
Benzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3
BTEX Surrogate (%)	%	108	104	96	107	103

BTEX in Soil					
Our Reference:	UNITS	SE87472-9	SE87472-1	SE87472-1	SE87472-1
			0	4	5
Your Reference		CTP20	CTP19	TRIP	TRIP SPIKE
				BLANK	
Sample Matrix		Soil	Soil	Soil	Soil
Depth		0.2-0.3	0.2-0.3	-	-
Date Sampled		4/05/2011	4/05/2011		
Date Extracted (BTEX)		13/05/2011	13/05/2011	13/05/2011	13/05/2011
Date Analysed (BTEX)		13/05/2011	13/05/2011	13/05/2011	13/05/2011
Benzene	mg/kg	<0.1	<0.1	<0.1	90%
Toluene	mg/kg	<0.1	<0.1	<0.1	93%
Ethylbenzene	mg/kg	<0.1	<0.1	<0.1	96%
Total Xylenes	mg/kg	<0.3	<0.3	<0.3	97%
BTEX Surrogate (%)	%	101	102	102	104



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 Unit 16/33 Maddox Street
 Alexandria NSW 2015
 Australia

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 f + 61 (0)2 8594 0499
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PROJECT: ENAUWOLL04006AA

TRH C6-C9 by P/T ONLY- in Soil		
Our Reference:	UNITS	SE87472-1 4
Your Reference		TRIP BLANK
Sample Matrix		Soil
Depth		-
Date Sampled		
Date Extracted (TRH C6-C9 PT)		13/05/2011
Date Analysed (TRH C6-C9 PT)		13/05/2011
TRH C6 - C9 P&T	mg/kg	<20



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TRH in soil with C6-C9 by P/T						
Our Reference:	UNITS	SE87472-1	SE87472-2	SE87472-4	SE87472-6	SE87472-8
Your Reference		CTP26	QA01	CTP25	CTP23	CTP21
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth		0.4-0.5m	0.4-0.5m	0.3-0.4m	0.3-0.4	0.1-0.2
		4/05/2011	4/05/2011	4/05/2011	4/05/2011	4/05/2011
Date Extracted (TRH C6-C9 PT)		13/05/2011	13/05/2011	13/05/2011	13/05/2011	13/05/2011
Date Analysed (TRH C6-C9 PT)		13/05/2011	13/05/2011	13/05/2011	13/05/2011	13/05/2011
TRH C6 - C9 P&T	mg/kg	<20	<20	<20	<20	<20
Date Extracted (TRH C10-C36)		13/05/2011	13/05/2011	13/05/2011	13/05/2011	13/05/2011
Date Analysed (TRH C10-C36)		13/05/2011	13/05/2011	13/05/2011	13/05/2011	13/05/2011
TRH C10 - C14	mg/kg	<20	<20	<20	<20	<20
TRH C15 - C28	mg/kg	<50	<50	<50	<50	<50
TRH C29 - C36	mg/kg	<50	<50	<50	<50	<50

TRH in soil with C6-C9 by P/T			
Our Reference:	UNITS	SE87472-9	SE87472-1
			0
Your Reference		CTP20	CTP19
Sample Matrix		Soil	Soil
Depth		0.2-0.3	0.2-0.3
Date Sampled		4/05/2011	4/05/2011
Date Extracted (TRH C6-C9 PT)		13/05/2011	13/05/2011
Date Analysed (TRH C6-C9 PT)		13/05/2011	13/05/2011
TRH C6 - C9 P&T	mg/kg	<20	<20
Date Extracted (TRH C10-C36)		13/05/2011	13/05/2011
Date Analysed (TRH C10-C36)		13/05/2011	13/05/2011
TRH C10 - C14	mg/kg	<20	<20
TRH C15 - C28	mg/kg	<50	<50
TRH C29 - C36	mg/kg	<50	<50



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PAHs in Soil						
Our Reference:	UNITS	SE87472-1	SE87472-2	SE87472-4	SE87472-6	SE87472-8
Your Reference		CTP26	QA01	CTP25	CTP23	CTP21
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth		0.4-0.5m	0.4-0.5m	0.3-0.4m	0.3-0.4	0.1-0.2
Date Sampled		4/05/2011	4/05/2011	4/05/2011	4/05/2011	4/05/2011
Date Extracted		13/05/2011	13/05/2011	13/05/2011	13/05/2011	13/05/2011
Date Analysed		13/05/2011	13/05/2011	13/05/2011	13/05/2011	13/05/2011
Naphthalene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthylene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Fluorene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Phenanthrene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Anthracene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Fluoranthene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Pyrene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo[a]anthracene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Chrysene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo[b]fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo[k]fluoranthene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo[a]pyrene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Indeno[123-cd]pyrene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Dibenzo[ah]anthracene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo[ghi]perylene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Total PAHs (sum)	mg/kg	<2	<2	<2	<2	<2
Nitrobenzene-d5	%	110	114	78	107	127
2-Fluorobiphenyl	%	108	126	75	100	107
p -Terphenyl-d14	%	120	118	79	104	96



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PAHs in Soil			
Our Reference:	UNITS	SE87472-9	SE87472-1 0
Your Reference		CTP20	CTP19
Sample Matrix		Soil	Soil
Depth		0.2-0.3	0.2-0.3
Date Sampled		4/05/2011	4/05/2011
Date Extracted		13/05/2011	13/05/2011
Date Analysed		13/05/2011	13/05/2011
Naphthalene	mg/kg	<0.10	<0.10
Acenaphthylene	mg/kg	<0.10	<0.10
Acenaphthene	mg/kg	<0.10	<0.10
Fluorene	mg/kg	<0.10	<0.10
Phenanthrene	mg/kg	<0.10	<0.10
Anthracene	mg/kg	<0.10	<0.10
Fluoranthene	mg/kg	<0.10	<0.10
Pyrene	mg/kg	<0.10	<0.10
Benzo[a]anthracene	mg/kg	<0.10	<0.10
Chrysene	mg/kg	<0.10	<0.10
Benzo[b]fluoranthene	mg/kg	<0.1	<0.1
Benzo[k]fluoranthene	mg/kg	<0.10	<0.10
Benzo[a]pyrene	mg/kg	<0.10	<0.10
Indeno[123-cd]pyrene	mg/kg	<0.10	<0.10
Dibenzo[ah]anthracene	mg/kg	<0.10	<0.10
Benzo[ghi]perylene	mg/kg	<0.10	<0.10
Total PAHs (sum)	mg/kg	<2	<2
Nitrobenzene-d5	%	114	122
2-Fluorobiphenyl	%	106	119
p -Terphenyl-d14	%	110	112



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OC Pesticides in Soil						
Our Reference:	UNITS	SE87472-1	SE87472-2	SE87472-4	SE87472-6	SE87472-8
Your Reference		CTP26	QA01	CTP25	CTP23	CTP21
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Deta Sampled		0.4-0.5m	0.4-0.5m	0.3-0.4m	0.3-0.4	0.1-0.2
		4/05/2011	4/05/2011	4/05/2011	4/05/2011	4/05/2011
Date Extracted		13/05/2011	13/05/2011	13/05/2011	13/05/2011	13/05/2011
Date Analysed		13/05/2011	13/05/2011	13/05/2011	13/05/2011	13/05/2011
НСВ	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC (Lindane)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
o,p-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-Endosulfan	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Chlordane (gamma)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
cis-Chlordane (alpha)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
p,p-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
o,p-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
o,p-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>beta</i> -Endosulfan	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
p,p-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
p,p-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
2,4,5,6-Tetrachloro-m-xylene (Surrogate	%	127	124	129	127	127



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Our Reference: UNITS SE87472-9 0 SE87472-9 0 Your Reference	OC Pesticides in Soil			
Your Reference Sample Matrix $$ Soil CTP20 Soil CTP30 Soil Depth $0.2-0.3$ $4/05/2011$ $0.2-0.3$ Date Sampled $13/05/2011$ $13/05/2011$ $13/05/2011$ Date Extracted $13/05/2011$ $13/05/2011$ $13/05/2011$ Date Analysed mg/kg <0.1 <0.1 HCB mg/kg <0.1 <0.1 alpha-BHC mg/kg <0.1 <0.1 gamma-BHC(Lindane) mg/kg <0.1 <0.1 Heptachlor mg/kg <0.1 <0.1 Aldrin mg/kg <0.1 <0.1 Heptachlor Epoxide mg/kg <0.1 <0.1 $0.\rho$ -DDE mg/kg <0.1 <0.1 $alpha-Endosulfan$ mg/kg <0.1 <0.1 $cis-Chlordane (alpha)$ mg/kg <0.1 <0.1 $cis-Chlordane (alpha)$ mg/kg <0.1 <0.1 $cis-Chlordane (alpha)$ mg/kg <0.1 <0.1	Our Reference:	UNITS	SE87472-9	SE87472-1
Your Reference CTP20 CTP19 Sample Matrix Soil Soil O.2-0.3 Depth 0.2-0.3 4/05/2011 4/05/2011 Date Sampled 13/05/2011 13/05/2011 13/05/2011 Date Extracted 13/05/2011 13/05/2011 13/05/2011 Date Analysed mg/kg <0.1				0
Sample Matrix Soil Soil 0.2-0.3 0.2-0.3 Depth 0.2-0.3 4/05/2011 4/05/2011 Date Sampled 13/05/2011 13/05/2011 Date Extracted 13/05/2011 13/05/2011 Date Analysed 13/05/2011 13/05/2011 HCB mg/kg <0.1	Your Reference		CTP20	CTP19
Depti $0.2-0.3$ $4/05/2011$ $0.2-0.3$ $4/05/2011$ $0.2-0.3$ $4/05/2011$ Date Sampled $13/05/2011$ $13/05/2011$ Date Extracted $13/05/2011$ $13/05/2011$ Date Analysed $13/05/2011$ $13/05/2011$ HCBmg/kg <0.1 <0.1 alpha-BHCmg/kg <0.1 <0.1 gamma-BHC (Lindane)mg/kg <0.1 <0.1 Heptachlormg/kg <0.1 <0.1 Aldrinmg/kg <0.1 <0.1 beta-BHCmg/kg <0.1 <0.1 delta-BHCmg/kg <0.1 <0.1 $0.p$ -DDEmg/kg <0.1 <0.1 a/pha -Endosulfanmg/kg <0.1 <0.1 $1a/pha$ -Endosulfanmg/kg <0.1 <0.1 <	Sample Matrix		Soil	Soil
Date campled HOULD IT HOULD IT Date Extracted 13/05/2011 13/05/2011 Date Analysed 13/05/2011 13/05/2011 HCB mg/kg <0.1	Depth Date Sampled		0.2-0.3	0.2-0.3
Date Extracted13/05/201113/05/2011Date Analysed13/05/201113/05/2011HCBmg/kg<0.1			4/03/2011	4/05/2011
Date Analysed13/05/201113/05/2011HCBmg/kg<0.1	Date Extracted		13/05/2011	13/05/2011
HCBmg/kg<0.1<0.1 $alpha$ -BHCmg/kg<0.1	Date Analysed		13/05/2011	13/05/2011
alpha-BHC mg/kg <0.1 <0.1 gamma-BHC (Lindane) mg/kg <0.1	НСВ	mg/kg	<0.1	<0.1
gamma-BHC (Lindane)mg/kg<0.1<0.1Heptachlormg/kg<0.1	alpha-BHC	mg/kg	<0.1	<0.1
Heptachlor mg/kg <0.1 <0.1 Aldrin mg/kg <0.1	gamma-BHC (Lindane)	mg/kg	<0.1	<0.1
Aldrin mg/kg <0.1 <0.1 beta-BHC mg/kg <0.1	Heptachlor	mg/kg	<0.1	<0.1
beta-BHC mg/kg <0.1 <0.1 delta-BHC mg/kg <0.1	Aldrin	mg/kg	<0.1	<0.1
delta-BHCmg/kg<0.1<0.1Heptachlor Epoxidemg/kg<0.1	beta-BHC	mg/kg	<0.1	<0.1
Heptachlor Epoxide mg/kg <0.1 <0.1 o,p-DDE mg/kg <0.1	delta-BHC	mg/kg	<0.1	<0.1
o,p-DDE mg/kg <0.1 <0.1 alpha-Endosulfan mg/kg <0.1	Heptachlor Epoxide	mg/kg	<0.1	<0.1
alpha-Endosulfan mg/kg <0.1 <0.1 trans-Chlordane (gamma) mg/kg <0.1	o,p-DDE	mg/kg	<0.1	<0.1
trans-Chlordane (gamma) mg/kg <0.1 <0.1 cis-Chlordane (alpha) mg/kg <0.1	alpha-Endosulfan	mg/kg	<0.1	<0.1
cis-Chlordane (alpha) mg/kg <0.1 <0.1 trans-Nonachlor mg/kg <0.1	trans-Chlordane (gamma)	mg/kg	<0.1	<0.1
trans-Nonachlormg/kg<0.1<0.1 p,p -DDEmg/kg<0.1	cis-Chlordane (alpha)	mg/kg	<0.1	<0.1
p,p-DDE mg/kg <0.1 <0.1 Dieldrin mg/kg <0.1	trans-Nonachlor	mg/kg	<0.1	<0.1
Dieldrin mg/kg <0.1 <0.1 Endrin mg/kg <0.1	p,p-DDE	mg/kg	<0.1	<0.1
Endrin mg/kg <0.1 <0.1 o,p-DDD mg/kg <0.1	Dieldrin	mg/kg	<0.1	<0.1
o,p-DDD mg/kg <0.1 <0.1 o,p-DDT mg/kg <0.1	Endrin	mg/kg	<0.1	<0.1
o,p-DDT mg/kg <0.1 <0.1 beta-Endosulfan mg/kg <0.1	o,p-DDD	mg/kg	<0.1	<0.1
beta-Endosulfan mg/kg <0.1 <0.1 ρ,ρ -DDD mg/kg <0.1	o,p-DDT	mg/kg	<0.1	<0.1
p,p-DDD mg/kg <0.1 <0.1 p,p-DDT mg/kg <0.1	beta-Endosulfan	mg/kg	<0.1	<0.1
p,p-DDT mg/kg <0.1 <0.1 Endosulfan Sulphate mg/kg <0.1	p,p-DDD	mg/kg	<0.1	<0.1
Endosulfan Sulphatemg/kg<0.1<0.1Endrin Aldehydemg/kg<0.1	p,p-DDT	mg/kg	<0.1	<0.1
Endrin Aldehydemg/kg<0.1<0.1Methoxychlormg/kg<0.1	Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor mg/kg <0.1 <0.1 Endrin Ketone mg/kg <0.1	Endrin Aldehyde	mg/kg	<0.1	<0.1
Endrin Ketonemg/kg<0.1<0.12,4,5,6-Tetrachloro-m-xylene (Surrogate%126127	Methoxychlor	mg/kg	<0.1	<0.1
2,4,5,6-Tetrachloro-m-xylene (Surrogate % 126 127	Endrin Ketone	mg/kg	<0.1	<0.1
	2,4,5,6-Tetrachloro-m-xylene (Surrogate	%	126	127



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OP Pesticides in Soil by GCMS						
Our Reference:	UNITS	SE87472-1	SE87472-2	SE87472-4	SE87472-6	SE87472-8
Your Reference		CTP26	QA01	CTP25	CTP23	CTP21
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth		0.4-0.5m	0.4-0.5m	0.3-0.4m	0.3-0.4	0.1-0.2
Date Sampled		4/05/2011	4/05/2011	4/05/2011	4/05/2011	4/05/2011
Date Extracted		13/05/2011	13/05/2011	13/05/2011	13/05/2011	13/05/2011
Date Analysed		13/05/2011	13/05/2011	13/05/2011	13/05/2011	13/05/2011
Dichlorvos	mg/kg	<1	<1	<1	<1	<1
Dimethoate	mg/kg	<1	<1	<1	<1	<1
Diazinon	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20
Chlorpyrifos-ethyl	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Bromofos-ethyl	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20
2-fluorobiphenyl (Surr)	%	108	126	108	104	106
d14-p-Terphenyl (Surr)	%	120	118	116	124	126

OP Pesticides in Soil by GCMS			
Our Reference:	UNITS	SE87472-9	SE87472-1 0
Your Reference		CTP20	CTP19
Sample Matrix		Soil	Soil
Depth		0.2-0.3	0.2-0.3
Date Sampled		4/05/2011	4/05/2011
Date Extracted		13/05/2011	13/05/2011
Date Analysed		13/05/2011	13/05/2011
Dichlorvos	mg/kg	<1	<1
Dimethoate	mg/kg	<1	<1
Diazinon	mg/kg	<0.5	<0.5
Fenitrothion	mg/kg	<0.2	<0.2
Malathion	mg/kg	<0.20	<0.20
Chlorpyrifos-ethyl	mg/kg	<0.2	<0.2
Parathion-ethyl	mg/kg	<0.2	<0.2
Bromofos-ethyl	mg/kg	<0.2	<0.2
Methidathion	mg/kg	<0.5	<0.5
Ethion	mg/kg	<0.2	<0.2
Azinphos-methyl	mg/kg	<0.20	<0.20
2-fluorobiphenyl (Surr)	%	112	118
d14-p-Terphenyl (Surr)	%	126	128



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PCBs in Soil						
Our Reference:	UNITS	SE87472-1	SE87472-2	SE87472-4	SE87472-6	SE87472-8
Your Reference		CTP26	QA01	CTP25	CTP23	CTP21
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth		0.4-0.5m	0.4-0.5m	0.3-0.4m	0.3-0.4	0.1-0.2
Date Sampled		4/05/2011	4/05/2011	4/05/2011	4/05/2011	4/05/2011
Date Extracted		13/05/2011	13/05/2011	13/05/2011	13/05/2011	13/05/2011
Date Analysed		13/05/2011	13/05/2011	13/05/2011	13/05/2011	13/05/2011
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1262	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1268	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total Positive PCB	mg/kg	<0.90	<0.90	<0.90	<0.90	<0.90
PCB_Surrogate 1	%	127	124	129	127	127

PCBs in Soil			
Our Reference:	UNITS	SE87472-9	SE87472-1
			0
Your Reference		CTP20	CTP19
Sample Matrix		Soil	Soil
Depth		0.2-0.3	0.2-0.3
Date Sampled		4/05/2011	4/05/2011
Date Extracted		13/05/2011	13/05/2011
Date Analysed		13/05/2011	13/05/2011
Arochlor 1016	mg/kg	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1
Arochlor 1262	mg/kg	<0.1	<0.1
Arochlor 1268	mg/kg	<0.1	<0.1
Total Positive PCB	mg/kg	<0.90	<0.90
PCB_Surrogate 1	%	126	127



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Metals in Soil by ICP-OES						
Our Reference:	UNITS	SE87472-1	SE87472-2	SE87472-4	SE87472-6	SE87472-8
Your Reference		CTP26	QA01	CTP25	CTP23	CTP21
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth		0.4-0.5m	0.4-0.5m	0.3-0.4m	0.3-0.4	0.1-0.2
Date Sampled		4/05/2011	4/05/2011	4/05/2011	4/05/2011	4/05/2011
Date Extracted (Metals)		16/05/2011	16/05/2011	16/05/2011	16/05/2011	16/05/2011
Date Analysed (Metals)		16/05/2011	16/05/2011	16/05/2011	16/05/2011	16/05/2011
Arsenic	mg/kg	<3	3	5	<3	4
Cadmium	mg/kg	<0.3	<0.3	0.4	0.3	0.4
Chromium	mg/kg	9.3	9.8	22	11	17
Copper	mg/kg	13	15	7.8	12	56
Lead	mg/kg	9.7	9.9	10	13	97
Nickel	mg/kg	7.4	11	2.5	4.7	4.4
Zinc	mg/kg	31	42	17	27	63

UNITS	SE87472-9	SE87472-1
		0
	CTP20	CTP19
	Soil	Soil
	0.2-0.3	0.2-0.3
	4/05/2011	4/05/2011
	10/05/0011	10/05/0011
	16/05/2011	16/05/2011
	16/05/2011	16/05/2011
mg/kg	4	4
mg/kg	0.3	0.3
mg/kg	21	17
mg/kg	8.5	21
mg/kg	11	14
mg/kg	3.2	9.3
mg/kg	19	54
	UNITS mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	UNITS SE87472-9 CTP20 Soil 0.2-0.3 4/05/2011 16/05/2011 16/05/2011 16/05/2011 mg/kg 4 mg/kg 21 mg/kg 8.5 mg/kg 11 mg/kg 11 mg/kg 3.2 mg/kg 19



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Mercury Cold Vapor/Hg Analyser						
Our Reference:	UNITS	SE87472-1	SE87472-2	SE87472-4	SE87472-6	SE87472-8
Your Reference		CTP26	QA01	CTP25	CTP23	CTP21
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth		0.4-0.5m	0.4-0.5m	0.3-0.4m	0.3-0.4	0.1-0.2
Date Sampled		4/05/2011	4/05/2011	4/05/2011	4/05/2011	4/05/2011
Date Extracted (Mercury)		16/05/2011	16/05/2011	16/05/2011	16/05/2011	16/05/2011
Date Analysed (Mercury)		16/05/2011	16/05/2011	16/05/2011	16/05/2011	16/05/2011
Mercury	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

Mercury Cold Vapor/Hg Analyser			
Our Reference:	UNITS	SE87472-9	SE87472-1
			0
Your Reference		CTP20	CTP19
Sample Matrix		Soil	Soil
Depth		0.2-0.3	0.2-0.3
Date Sampled		4/05/2011	4/05/2011
Date Extracted (Mercury)		16/05/2011	16/05/2011
Date Analysed (Mercury)		16/05/2011	16/05/2011
Mercury	mg/kg	<0.05	<0.05



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Asbestos ID in soil						
Our Reference:	UNITS	SE87472-1	SE87472-4	SE87472-6	SE87472-8	SE87472-9
Your Reference		CTP26	CTP25	CTP23	CTP21	CTP20
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth		0.4-0.5m	0.3-0.4m	0.3-0.4	0.1-0.2	0.2-0.3
Date Sampled		4/05/2011	4/05/2011	4/05/2011	4/05/2011	4/05/2011
Date Analysed		17/05/2011	17/05/2011	17/05/2011	17/05/2011	17/05/2011
Sample Description		40g Soil	17g Soil,clay	30g Soil,clay	37g Soil,rocks	25g Soil,rocks
Asbestos ID in soil	-	No asbestos detected Organic fibres detected	No asbestos detected	No asbestos detected Organic fibres detected	Chrysotile asbestos detected Organic fibres detected	No asbestos detected Organic fibres detected

Asbestos ID in soil		
Our Reference:	UNITS	SE87472-1
		0
Your Reference		CTP19
Sample Matrix		Soil
Depth		0.2-0.3
Date Sampled		4/05/2011
Date Analysed		17/05/2011
Sample Description		29g
		Soil,rocks
Asbestos ID in soil	-	No
		asbestos
		detected
		Organic
		fibres
		detected



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Moisture						
Our Reference:	UNITS	SE87472-1	SE87472-2	SE87472-4	SE87472-6	SE87472-8
Your Reference		CTP26	QA01	CTP25	CTP23	CTP21
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth		0.4-0.5m	0.4-0.5m	0.3-0.4m	0.3-0.4	0.1-0.2
Date Sampled		4/05/2011	4/05/2011	4/05/2011	4/05/2011	4/05/2011
Date Analysed (moisture)		13/05/2011	13/05/2011	13/05/2011	13/05/2011	13/05/2011
Date Analyseu (moisture)		13/03/2011	13/03/2011	13/03/2011	13/03/2011	13/03/2011
Moisture	%	21	15	18	25	15

Moisture Our Reference:	UNITS	SE87472-9	SE87472-1	SE87472-1
Your Reference		CTP20	0 CTP19	4 TRIP BLANK
Sample Matrix		Soil	Soil	Soil
Depth Date Sampled		0.2-0.3 4/05/2011	0.2-0.3 4/05/2011	-
Date Analysed (moisture)		13/05/2011	13/05/2011	13/05/2011
Moisture	%	21	29	19



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Method ID	Methodology Summary
AN410	BTEX / C6-C9 Hydrocarbons - Soil samples are extracted with methanol, purged and concentrated by a purge
	and trap apparatus, and then analysed using GC/MS technique. Water samples undergo the same analysis
	without the extraction step. Based on USEPA 5030B and 8260B.
AN403	Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36, in accordance with the Australian Institute of Petroleum (AIP). Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Petroleum Hydrocarbons (TPH) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the elluent solvents. The GC/FID method is not well suited to the analysis of refined high boiling point materials (i.e. lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol (if care to control volatility is taken). This method will detect naturally occurring hydrocarbons, lipids, organic acids, phenols and PAHs if they are present at sufficient levels, dependant on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN422	Polynuclear Aromatic Hydrocarbons - determined by solvent extraction with dichloromethane / acetone for soils and dichloromethane for waters, followed by instrumentation analysis using GC/MS SIM mode.
AN400	The determination of organochlorine (OC) and organophosphorus (OP) pesticides and polychlorinated biphenyls (PCBs) in soils, sludges and groundwater. (Based on USEPA methods 3510, 3550, 8140 and 8080.)
AN420	Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates, and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD/FID technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN320	
AN312	After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN602	Analysed using in house method AN602 - Qualitative identification of Asbestos Fibres, Synthetic Mineral Fibres and Organic Fibres in bulk samples (including building materials and soils) using Polarised Light Microscopy and Dispersion Staining Techniques. This method complies with AS4964-2004: Method for the Qualitative Identification of Asbestos in Bulk Samples.
AN002	



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REPORT NO: SE87472

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
BTEX in Soil						Base + Duplicate + %RPD		Duplicate + %RPD
Date Extracted (BTEX)				13/05/1 1	SE87472-6	13/05/2011 13/05/2011	SE87472-8	13/05/11
Date Analysed (BTEX)				13/05/1 1	SE87472-6	13/05/2011 13/05/2011	SE87472-8	13/05/11
Benzene	mg/kg	0.1	AN410	<0.1	SE87472-6	<0.1 <0.1	SE87472-8	114%
Toluene	mg/kg	0.1	AN410	<0.1	SE87472-6	<0.1 <0.1	SE87472-8	120%
Ethylbenzene	mg/kg	0.1	AN410	<0.1	SE87472-6	<0.1 <0.1	SE87472-8	123%
Total Xylenes	mg/kg	0.3	AN410	<0.3	SE87472-6	<0.3 <0.3	SE87472-8	118%
BTEX Surrogate (%)	%	0	AN410	121	SE87472-6	107 100 RPD: 7	SE87472-8	106%

QUALITY CONTROL	UNITS	LOR	METHOD	Blank
TRH C6-C9 by P/T				
ONLY- in Soil				
Date Extracted (TRH				13/05/1
C6-C9 PT)				1
Date Analysed (TRH				13/05/1
C6-C9 PT)				1
TRH C6 - C9 P&T	mg/kg	20	AN410	<20

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
by P/T						8ase + Duplicate + %RPD		Duplicate + %RPD
Date Extracted (TRH C6-C9 PT)				13/05/1 1	SE87472-6	13/05/2011 13/05/2011	SE87472-8	13/05/11
Date Analysed (TRH C6-C9 PT)				13/05/1 1	SE87472-6	13/05/2011 13/05/2011	SE87472-8	13/05/11
TRH C6 - C9 P&T	mg/kg	20	AN410	<20	SE87472-6	<20 <20	SE87472-8	111%
Date Extracted (TRH C10-C36)				13/05/2 011	SE87472-6	13/05/2011 13/05/2011	[NR]	[NR]
Date Analysed (TRH C10-C36)				13/05/2 011	SE87472-6	13/05/2011 13/05/2011	[NR]	[NR]
TRH C10 - C14	mg/kg	20	AN403	<20	SE87472-6	<20 [N/T]	[NR]	[NR]
TRH C15 - C28	mg/kg	50	AN403	<50	SE87472-6	<50 [N/T]	[NR]	[NR]
TRH C29 - C36	mg/kg	50	AN403	<50	SE87472-6	<50 [N/T]	[NR]	[NR]



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REPORT NO: SE87472

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
PAHs in Soil						Base + Duplicate + %RPD		Duplicate + %RPD
Date Extracted				13/05/1 1	SE87472-1	13/05/2011 13/05/2011	LCS	13/05/11
Date Analysed				13/05/1 1	SE87472-1	13/05/2011 13/05/2011	LCS	13/05/11
Naphthalene	mg/kg	0.1	AN422	<0.10	SE87472-1	<0.10 <0.10	LCS	92%
Acenaphthylene	mg/kg	0.1	AN422	<0.10	SE87472-1	<0.10 <0.10	LCS	91%
Acenaphthene	mg/kg	0.1	AN422	<0.10	SE87472-1	<0.10 <0.10	LCS	104%
Fluorene	mg/kg	0.1	AN422	<0.10	SE87472-1	<0.10 <0.10	[NR]	[NR]
Phenanthrene	mg/kg	0.1	AN422	<0.10	SE87472-1	<0.10 <0.10	LCS	96%
Anthracene	mg/kg	0.1	AN422	<0.10	SE87472-1	<0.10 <0.10	LCS	105%
Fluoranthene	mg/kg	0.1	AN422	<0.10	SE87472-1	<0.10 <0.10	LCS	96%
Pyrene	mg/kg	0.1	AN422	<0.10	SE87472-1	<0.10 <0.10	LCS	105%
Benzo[a]anthracene	mg/kg	0.1	AN422	<0.10	SE87472-1	<0.10 <0.10	[NR]	[NR]
Chrysene	mg/kg	0.1	AN422	<0.10	SE87472-1	<0.10 <0.10	[NR]	[NR]
Benzo[b]fluoranthene	mg/kg	0.1	AN422	<0.1	SE87472-1	<0.1 <0.1	[NR]	[NR]
Benzo[k]fluoranthene	mg/kg	0.1	AN422	<0.10	SE87472-1	<0.10 <0.10	[NR]	[NR]
Benzo[a]pyrene	mg/kg	0.1	AN422	<0.10	SE87472-1	<0.10 <0.10	LCS	90%
Indeno[<i>123-cd</i>]pyren e	mg/kg	0.1	AN422	<0.10	SE87472-1	<0.10 <0.10	[NR]	[NR]
Dibenzo[<i>ah</i>]anthrace ne	mg/kg	0.1	AN422	<0.10	SE87472-1	<0.10 <0.10	[NR]	[NR]
Benzo[ghi]perylene	mg/kg	0.1	AN422	<0.10	SE87472-1	<0.10 <0.10	[NR]	[NR]
Total PAHs (sum)	mg/kg	1.6	AN422	<2	SE87472-1	<2 <2	[NR]	[NR]
Nitrobenzene-d5	%	0	AN422	121	SE87472-1	110 114 RPD: 4	LCS	127%
2-Fluorobiphenyl	%	0	AN422	110	SE87472-1	108 122 RPD: 12	LCS	127%
p -Terphenyl-d 14	%	0	AN422	114	SE87472-1	120 110 RPD: 9	LCS	112%



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REPORT NO: SE87472

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
OC Pesticides in Soil						Base + Duplicate + %RPD		Duplicate + %RPD
Date Extracted				13/05/2 011	SE87472-2	13/05/2011 13/05/2011	LCS	13/05/2011
Date Analysed				13/05/2 011	SE87472-2	13/05/2011 13/05/2011	LCS	13/05/2011
НСВ	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	[NR]	[NR]
gamma-BHC (Lindane)	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	[NR]	[NR]
Heptachlor	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	LCS	127%
Aldrin	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	LCS	112%
beta-BHC	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	[NR]	[NR]
delta-BHC	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	LCS	111%
Heptachlor Epoxide	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	[NR]	[NR]
o,p-DDE	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	[NR]	[NR]
alpha-Endosulfan	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	[NR]	[NR]
trans-Chlordane (gamma)	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	[NR]	[NR]
cis-Chlordane (alpha)	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	[NR]	[NR]
trans-Nonachlor	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	[NR]	[NR]
p,p-DDE	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	[NR]	[NR]
Dieldrin	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	LCS	110%
Endrin	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	LCS	123%
o,p-DDD	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	[NR]	[NR]
o,p-DDT	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	[NR]	[NR]
beta-Endosulfan	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	[NR]	[NR]
p,p-DDD	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	[NR]	[NR]
p,p-DDT	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	LCS	118%
Endosulfan Sulphate	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	[NR]	[NR]
Methoxychlor	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	[NR]	[NR]
Endrin Ketone	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	[NR]	[NR]
2,4,5,6-Tetrachloro-m-xy lene (Surrogate	%	0	AN400	117	SE87472-2	124 129 RPD: 4	LCS	123%



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REPORT NO: SE87472

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate	Duplicate	Spike Sm#	Matrix Spike %
OP Pesticides in Soil by GCMS					Sill#	Base + Duplicate + %RPD		Duplicate + %RPD
Date Extracted				13/05/2 011	SE87472-1	13/05/2011 13/05/2011	LCS	13/05/2011
Date Analysed				13/05/2 011	SE87472-1	13/05/2011 13/05/2011	LCS	13/05/2011
Dichlorvos	mg/kg	1	AN420	<1	SE87472-1	<1 <1	LCS	90%
Dimethoate	mg/kg	1	AN420	<1	SE87472-1	<1 <1	[NR]	[NR]
Diazinon	mg/kg	0.5	AN420	<0.5	SE87472-1	<0.5 <0.5	LCS	89%
Fenitrothion	mg/kg	0.2	AN420	<0.2	SE87472-1	<0.2 <0.2	[NR]	[NR]
Malathion	mg/kg	0.2	AN420	<0.20	SE87472-1	<0.20 <0.20	[NR]	[NR]
Chlorpyrifos-ethyl	mg/kg	0.2	AN420	<0.2	SE87472-1	<0.2 <0.2	LCS	100%
Parathion-ethyl	mg/kg	0.2	AN420	<0.2	SE87472-1	<0.2 <0.2	[NR]	[NR]
Bromofos-ethyl	mg/kg	0.2	AN420	<0.2	SE87472-1	<0.2 <0.2	[NR]	[NR]
Methidathion	mg/kg	0.5	AN420	<0.5	SE87472-1	<0.5 <0.5	[NR]	[NR]
Ethion	mg/kg	0.2	AN420	<0.2	SE87472-1	<0.2 <0.2	LCS	90%
Azinphos-methyl	mg/kg	0.2	AN420	<0.20	SE87472-1	<0.20 <0.20	[NR]	[NR]
2-fluorobiphenyl (Surr)	%	0	AN420	82	SE87472-1	108 122 RPD: 12	LCS	108%
d14-p-Terphenyl (Surr)	%	0	AN420	94	SE87472-1	120 110 RPD: 9	LCS	114%

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate	Duplicate	Spike Sm#	Matrix Spike %
PCBs in Soil					511#	Base + Duplicate + %RPD		Duplicate + %RPD
Date Extracted				13/05/2 011	SE87472-2	13/05/2011 13/05/2011	SE87472-4	13/05/2011
Date Analysed				13/05/2 011	SE87472-2	13/05/2011 13/05/2011	SE87472-4	13/05/2011
Arochlor 1016	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	[NR]	[NR]
Arochlor 1221	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	[NR]	[NR]
Arochlor 1232	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	[NR]	[NR]
Arochlor 1242	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	[NR]	[NR]
Arochlor 1248	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	[NR]	[NR]
Arochlor 1254	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	[NR]	[NR]
Arochlor 1260	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	SE87472-4	80%
Arochlor 1262	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	[NR]	[NR]
Arochlor 1268	mg/kg	0.1	AN400	<0.1	SE87472-2	<0.1 <0.1	[NR]	[NR]
Total Positive PCB	mg/kg	0.9	AN400	<0.90	SE87472-2	<0.90 <0.90	[NR]	[NR]
PCB_Surrogate 1	%	0	AN400	117	SE87472-2	124 129 RPD: 4	SE87472-4	129%



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REPORT NO: SE87472

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
Metals in Soil by ICP-OES						Base + Duplicate + %RPD		Duplicate + %RPD
Date Extracted (Metals)				16/05/2 011	[NT]	[NT]	LCS	16/05/2011
Date Analysed (Metals)				16/05/2 011	[NT]	[NT]	LCS	16/05/2011
Arsenic	mg/kg	3	AN320	<3	[NT]	[NT]	LCS	92%
Cadmium	mg/kg	0.3	AN320	<0.3	[NT]	[NT]	LCS	99%
Chromium	mg/kg	0.3	AN320	<0.3	[NT]	[NT]	LCS	100%
Copper	mg/kg	0.5	AN320	<0.5	[NT]	[NT]	LCS	94%
Lead	mg/kg	1	AN320	<1	[NT]	[NT]	LCS	97%
Nickel	mg/kg	0.5	AN320	<0.5	[NT]	[NT]	LCS	100%
Zinc	mg/kg	0.5	AN320	<0.5	[NT]	[NT]	LCS	97%

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
Mercury Cold Vapor/Hg Analyser						Base + Duplicate + %RPD		Duplicate + %RPD
Date Extracted (Mercury)				16/05/1 1	SE87472-1	16/05/2011 16/05/2011	SE87472-2	16/05/11
Date Analysed (Mercury)				16/05/1 1	SE87472-1	16/05/2011 16/05/2011	SE87472-2	16/05/11
Mercury	mg/kg	0.05	AN312	<0.05	SE87472-1	<0.05 <0.05	SE87472-2	104%

QUALITY CONTROL	UNITS	LOR	METHOD	Blank
Asbestos ID in soil				
Date Analysed				[NT]

QUALITY CONTROL	UNITS	LOR	METHOD	Blank
Hold sample- NO test required				
Sample on HOLD		[NT]		[NT]

QUALITY CONTROL	UNITS	LOR	METHOD	Blank
Moisture				
Date Analysed (moisture)				[NT]
Moisture	%	1	AN002	<1



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QUALITY CONTROL	UNITS	Dup. Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
TRH in soil with C6-C9 by P/T			Base + Duplicate + %RPD		Duplicate + %RPD
Date Extracted (TRH C6-C9 PT)		SE87472-1	13/05/2011 13/05/2011	[NR]	[NR]
Date Analysed (TRH C6-C9 PT)		SE87472-1	13/05/2011 13/05/2011	[NR]	[NR]
Date Extracted (TRH C10-C36)		SE87472-1	13/05/2011 13/05/2011	LCS	13/05/2011
Date Analysed (TRH C10-C36)		SE87472-1	13/05/2011 13/05/2011	LCS	13/05/2011
TRH C10 - C14	mg/kg	SE87472-1	<20 <20	LCS	87%
TRH C15 - C28	mg/kg	SE87472-1	<50 <50	LCS	84%
TRH C29 - C36	mg/kg	SE87472-1	<50 <50	LCS	85%



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Result Codes

Report Comments Sampled by the client

[LOR] :

 [INS]
 :
 Insufficient Sample for this test

 [NR]
 :
 Not Requested

 [NT]
 :
 Not tested

Limit of reporting

[RPD] : Relative Percentage Difference

- : Not part of NATA Accreditation
- [N/A] : Not Applicable

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

No respirable fibres detected using trace analysis technique.

Sample #8: 1-2mm length fibre bundle hand picked and found loose in sample.

Asbestos analysed by Approved Identifier Yusuf Kuthpudin.

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

Date Organics extraction commenced:

NATA Corporate Accreditation No. 2562, Site No 4354

Note: Test results are not corrected for recovery (excluding Air-toxics and Dioxins/Furans*) This document is issued by the Company subject to its General Conditions of Service (www.sgs.com/terms_and_conditions.htm). Attention is drawn to the limitations of liability, indemnification and jurisdictional issues established therein.

This document is to be treated as an original within the meaning of UCP 600. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

Quality Control Protocol

Method Blank: An analyte free matrix to which all reagents are added in the same volume or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. A method blank is prepared every 20 samples.

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

Surrogate Spike: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. Surrogates are added to samples before extraction to monitor extraction efficiency and percent recovery in each sample.

Internal Standard: Added to all samples requiring analysis for organics (where relevant) or metals by ICP after the extraction/digestion process; the compounds/elements serve to give a standard of retention time and/or response, which is invariant from run-to-run with the instruments.

Laboratory Control Sample: A known matrix spiked with compound(s) representative of the target analytes. It is used to document laboratory performance. When the results of the matrix spike analysis indicates a potential problem due to the sample matrix itself, the LCS results are used to verify that the laboratory can perform the analysis in a clean matrix.

Matrix Spike: An aliquot of sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.

Quality Acceptance Criteria

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: http://www.au.sgs.com/sgs-mp-au-env-qu-022-qa-qc-plan-en-09.pdf



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SGS Australia Pty Ltd ABN 44 000 964 278



SAMPLE RECEIPT ADVICE (SRA)

12 May 2011

Client Details Requested By Client Contact Address	:	Manuel Fernandez Coffey Environments Pty Ltd Manuel Fernandez 118 Auburn Street Wollongong NSW 2500	Laborat Laborat Manage Address	tory Details ory : s :	SGS Environmental Services Edward Ibrahim Unit 16, 33 Maddox Street Alexandria NSW 2015
Email Telephone Facsimile	:	manuel_fernandez@coffey.com 02 4201 1400 02 4201 1401	Email Telepho Facsimil	ne : e :	au.samplereceipt.sydney@sgs.com 61 2 8594 0400 61 2 8594 0499
Project Order Number Samples	:	ENAUWOLL04006AA 28763 15 Soils	Report No. of S Due Dat	No : amples : re :	SE87472 15 17/05/2011
Date Instructions Received Sample Receipt Date	:	11/05/2011 6/5/11			
Samples received in good orde Samples received without head Upon receipt sample temperatu Sample containers provided by Turnaround time requested	r dspao re :	: YES DOI YES Cool : SGS : Standard	Samples received in correc Sufficient quantity supplied Cooling Method Samples clearly Labelled Completed documentation re	t container:; : : eceived :	YES YES Ice Pack YES YES

Samples will be held for 1 month for water samples and 3 months for soil samples from date of receipt of samples, unless otherwise instructed.

Comments

Extra samples CTP03(0.2-0.3) and QA02(0.1-0.2) received.

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

The signed chain of custody will be returned to you with the original report.



81 Autorio 119 100 | Unit 16, 33 Maddox Street Alexandria New South Wales 2015 t+61 (0)2 8594 0400 f+61 (0)2 85940499 www.au.sgs.com



SAMPLE RECEIPT ADVICE (SRA) - continued

Client	:	Coffey Environments Pty Ltd	Report No	:	SE87472
Project	:	ENAUWOLL04006AA			

Summary of Samples and Requested Analysis

The table below represents SGS Environmental Service's understanding and interpretation of the customer supplied sample request.

Please indicate ASAP if your request differs from these details.

Testing shall commence immediately as per this table, unless the customer intervenes with a correction prior to testing. Note that a small X in the table below indicates some testing has not been requested in the package.

Sample No.	Description	Metals Prep, soil 8 HM	BTEX in Soil	TRH C6-C9 by P/T ONLY- in Soil	TRH in soil with C6-C9 by P/T	PAHs in Soil	OC Pesticides in Soil	OP Pesticides in Soil by GCMS	PCBs in Soil	Metals in Soil by ICP-OES	Mercury Cold Vapor/Hg Analyser	Asbestos ID in soil	Hold sample-NO test required	Moisture
1	CTP26	Х	Х		Х	Х	Х	Х	Х	Х	Х	Х		Х
2	QA01	Х	Х		Х	Х	Х	Х	Х	Х	Х			Х
3	CTP26												Х	
4	CTP25	Х	Х		Х	Х	Х	Х	Х	Х	Х	Х		Х
5	CTP24												Х	
6	CTP23	Х	Х		Х	Х	Х	Х	Х	Х	Х	Х		Х
7	CTP22												Х	
8	CTP21	Х	Х		Х	Х	Х	Х	Х	Х	Х	Х		Х
9	CTP20	Х	Х		Х	Х	Х	Х	Х	Х	Х	Х		Х
10	CTP19	Х	Х		Х	Х	Х	Х	Х	Х	Х	Х		Х
11	CTP18												Х	
12	CTP03												Х	
13	QA02												Х	
14	TRIP BLANK		Х	Х										Х
15	TRIP SPIKE		Х											



SAMPLE RECEIPT ADVICE (SRA) - continued

Client Project	:	Coffey Environments Pty Ltd ENAUWOLL04006AA	Report No	:	SE87472

Sample No.	Description
1	CTP26
2	QA01
3	CTP26
4	CTP25
5	CTP24
6	CTP23
7	CTP22
8	CTP21
9	CTP20
10	CTP19
11	CTP18
12	CTP03
13	QA02
14	TRIP BLANK
15	TRIP SPIKE

coffey?	Chain of Custody	Laboratory Quotation / Orde	ar No:	JOB NOTEN HEALDUIC LO PONDE	No: 28 103
Dispatch to: SGS ENV Address & UNIT 16, 33	Maddox St, Alexandria	Sampled by: CHILIS APPER	EAMP	Consigning Officer CA Date Dispatched: 5/5/20/	
Attention: Stranpue fil	ECENT	Project Manager: (report results to) CHILI	S APPEURAM	Courier Service: M+6 Consignment Note No: 359	735
Relinquished by:	1	Date:) Time:	Received hv:		2
1 CHURY 2 CAR STOHO	N	575/7 11			vale: lime:
		1.20101		0	1 2/9
	ix		*	Antilyses Required	(AP) (AAY) Et
Comments	Sample Mat Container Type and Preservative	Sample No.	Date Sample PAHs PAHs MAHs = BTEX	Metals: *	Stoc (PCC C6-C9/B BTECX tocd Sample Condition
0.4 - 0.5 M	Soil 250% Jar 10	1. 92,10	4/52011		
0-4-0.5m	W N N N N N N N N N N N N N N N N N N N	NA OI	1/2/1/1	1	
0.1 -0. Zrm	11 Zip Bag	26 3 S d L	4/5/201 .		
Wh-0-50	11/1 250, Qr/210 C	4 52 dL	4/2/104 1		
2.4 1 2.0	1 20 1 20	11-4	a wallelb		1
0.1 - 0.2	A dim 1 mil me	1772 C	1 20 0 1 1 1		
0.1 - 0.2		2001	1100 10 10 10		
50-20 WONAVEND	0 1) W	1970 8	4/5/2001		
0-2 - 0-25		1919 10	1 10415/0		
5:0-2-2-0	1 4 h	11 8121	4/5/101	and an and a street	
		10-0 50-1- 10			
-		TOTO GRAAL IS	1	01VED 6 1 4 4	. Am
0.1-0.2	8	CT103 12	1	77	
3.1-0.2		DAOL 13	8	mplas intac 7 h	
				The state of the s	
Special Laboratory Instructions:	(arsenic, cadmium, chippy	ium, icipal, land,	Mercury, Nicker	ALTER FOCULON (ST UNDER POLICIES) (ST UNDER POLICIES) (13, ADE	JOB NUMBER MUST REFERENCED ON A



ANALYTICAL REPORT

21 June 2011

Coffey Environments Pty Ltd

118 Auburn Street Wollongong **NSW 2500**

Attention: **Chris Appelkamp**

Your Reference: ENAUWOLL04006AA

Our Reference: SE88232

Samples: Received: 20 Soil, 1 Water 14/06/2011

Preliminary Report Sent: Not Issued

These samples were analysed in accordance with your written instructions.

For and on Behalf of: SGS ENVIRONMENTAL SERVICES

Sample Receipt: **Production Manager:** Angela Mamalicos Huong Crawford

AU.SampleReceipt.Sydney@sgs.com Huong.Crawford@sgs.com

Results Approved and/or Authorised by:

Dong Liang Inorganic/Metal Superviso

Huong Crawford

Metals Signatory



Ly Kim Ha

Organics Signatory



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Environmental Services Unit 16/33 Maddox Street Alexandria NSW 2015 Australia t +61 (0)2 8594 0400 f + 61 (0)2 8594 0499

www.au.sgs.com

BTEX in Soil						
Our Reference:	UNITS	SE88232-2	SE88232-3	SE88232-4	SE88232-5	SE88232-6
Your Reference		SS01	SS02	SS03	QA11	SS04
Depth		0.0m -				
		0.10m	0.10m	0.10m	0.10m	0.10m
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		9/06/2011	9/06/2011	9/06/2011	9/06/2011	9/06/2011
Date Extracted (BTEX)		16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011
Date Analysed (BTEX)		17/06/2011	17/06/2011	17/06/2011	17/06/2011	17/06/2011
Benzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3
BTEX Surrogate (%)	%	96	105	98	99	91

BTEX in Soil						
Our Reference:	UNITS	SE88232-7	SE88232-8	SE88232-1	SE88232-1	SE88232-1
				4	5	8
Your Reference		SS05	SS06	SS11	SS12	SS15
Depth		0.0m -				
		0.10m	0.10m	0.10m	0.10m	0.10m
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		9/06/2011	9/06/2011	9/06/2011	9/06/2011	9/06/2011
Date Extracted (BTEX)		16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011
Date Analysed (BTEX)		17/06/2011	17/06/2011	17/06/2011	17/06/2011	17/06/2011
Benzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3
BTEX Surrogate (%)	%	95	94	100	91	87



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BTEX in Soil		
Our Reference:	UNITS	SE88232-2
		0
Your Reference		SS17
Depth		0.0m -
		0.10m
Sample Matrix		Soil
Date Sampled		9/06/2011
Date Extracted (BTEX)		16/06/2011
Date Analysed (BTEX)		17/06/2011
Benzene	mg/kg	<0.1
Toluene	mg/kg	<0.1
Ethylbenzene	mg/kg	<0.1
Total Xylenes	mg/kg	<0.3
BTEX Surrogate (%)	%	79



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SGS Australia Pty Ltd ABN 44 000 964 278

OC Pesticides in Soil						
Our Reference:	UNITS	SE88232-2	SE88232-3	SE88232-4	SE88232-5	SE88232-6
Your Reference		SS01	SS02	SS03	QA11	SS04
Depth		0.0m -				
Or much Matrix		0.10m	0.10m	0.10m	0.10m	0.10m
Date Sampled		5011 9/06/2011	50II 9/06/2011	5011 9/06/2011	5011 9/06/2011	5011 9/06/2011
		0/00/2011	0/00/2011	0/00/2011	0/00/2011	0/00/2011
Date Extracted		16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011
Date Analysed		16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011
НСВ	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC (Lindane)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
o,p-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-Endosulfan	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Chlordane (gamma)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
cis-Chlordane (alpha)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
p,p-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
o,p-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
o,p-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-Endosulfan	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
p,p-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
p,p-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
2,4,5,6-Tetrachloro-m-xylene (Surrogate	%	101	110	119	112	125



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SGS Australia Pty Ltd ABN 44 000 964 278

REPORT NO: SE88232

OC Pesticides in Soil						
Our Reference:	UNITS	SE88232-7	SE88232-8	SE88232-1	SE88232-1	SE88232-1
				4	5	8
Your Reference		SS05	SS06	SS11	SS12	SS15
Depth		0.0m -	0.0m -	0.0m -	0.0m -	0.0m -
Sample Matrix		0.10m Soil	0. TUTT Soil	0.10m Soil	0.10111 Soil	0.1011 Soil
Date Sampled		9/06/2011	9/06/2011	9/06/2011	9/06/2011	9/06/2011
Data Extracted		16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011
		16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011
HCB	ma/ka	<0.1	<0.1	<0.1	<0.1	<0.1
	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
	mg/kg	<0.1	<0.1	<0.1	-0.1	<0.1
gamma-BHC (Lindane)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
o,p-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-Endosulfan	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Chlordane (gamma)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
cis-Chlordane (alpha)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
p,p-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
o,p-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
o,p-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>beta</i> -Endosulfan	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
p,p-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
p,p-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
2,4,5,6-Tetrachloro-m-xylene (Surrogate	%	123	111	114	124	113



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OC Pesticides in Soil		
Our Reference:	UNITS	SE88232-2
		0
Your Reference		SS17
Depth		0.0m -
Somela Matrix		0.10m
Date Sampled		5011 9/06/2011
		0/00/2011
Date Extracted		16/06/2011
Date Analysed		16/06/2011
НСВ	mg/kg	<0.1
alpha-BHC	mg/kg	<0.1
gamma-BHC (Lindane)	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
Aldrin	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
o,p-DDE	mg/kg	<0.1
<i>alpha-</i> Endosulfan	mg/kg	<0.1
trans-Chlordane (gamma)	mg/kg	<0.1
cis-Chlordane (alpha)	mg/kg	<0.1
trans-Nonachlor	mg/kg	<0.1
p,p-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
o,p-DDD	mg/kg	<0.1
o,p-DDT	mg/kg	<0.1
<i>beta</i> -Endosulfan	mg/kg	<0.1
p,p-DDD	mg/kg	<0.1
p,p-DDT	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Endrin Ketone	mg/kg	<0.1
2,4,5,6-Tetrachloro-m-xylene (Surrogate	%	120



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PCBs in Soil						
Our Reference:	UNITS	SE88232-2	SE88232-3	SE88232-4	SE88232-5	SE88232-6
Your Reference		SS01	SS02	SS03	QA11	SS04
Depth		0.0m -				
		0.10m	0.10m	0.10m	0.10m	0.10m
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		9/06/2011	9/06/2011	9/06/2011	9/06/2011	9/06/2011
Date Extracted		16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011
Date Analysed		16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1262	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1268	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total Positive PCB	mg/kg	<0.90	<0.90	<0.90	<0.90	<0.90
PCB_Surrogate 1	%	101	110	119	112	125

PCBs in Soil						
Our Reference:	UNITS	SE88232-7	SE88232-8	SE88232-1	SE88232-1	SE88232-1
				4	5	8
Your Reference		SS05	SS06	SS11	SS12	SS15
Depth		0.0m -				
		0.10m	0.10m	0.10m	0.10m	0.10m
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		9/06/2011	9/06/2011	9/06/2011	9/06/2011	9/06/2011
Date Extracted		16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011
Date Analysed		16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1262	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1268	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total Positive PCB	mg/kg	<0.90	<0.90	<0.90	<0.90	<0.90
PCB_Surrogate 1	%	123	111	114	124	113



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PCBs in Soil		
Our Reference:	UNITS	SE88232-2
		0
Your Reference		SS17
Depth		0.0m -
		0.10m
Sample Matrix		Soil
Date Sampled		9/06/2011
Date Extracted		16/06/2011
Date Analysed		16/06/2011
Arochlor 1016	mg/kg	<0.1
Arochlor 1221	mg/kg	<0.1
Arochlor 1232	mg/kg	<0.1
Arochlor 1242	mg/kg	<0.1
Arochlor 1248	mg/kg	<0.1
Arochlor 1254	mg/kg	<0.1
Arochlor 1260	mg/kg	<0.1
Arochlor 1262	mg/kg	<0.1
Arochlor 1268	mg/kg	<0.1
Total Positive PCB	mg/kg	<0.90
PCB_Surrogate 1	%	120



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Metals in Soil by ICP-OES						
Our Reference:	UNITS	SE88232-2	SE88232-3	SE88232-4	SE88232-5	SE88232-6
Your Reference		SS01	SS02	SS03	QA11	SS04
Depth		0.0m -				
		0.10m	0.10m	0.10m	0.10m	0.10m
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		9/06/2011	9/06/2011	9/06/2011	9/06/2011	9/06/2011
Date Extracted (Metals)		16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011
Date Analysed (Metals)		16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011
Arsenic	mg/kg	<3	4	3	<3	4
Cadmium	mg/kg	<0.3	<0.3	0.5	0.4	<0.3
Chromium	mg/kg	22	50	26	11	14
Copper	mg/kg	82	110	13	11	25
Lead	mg/kg	17	17	65	76	25
Nickel	mg/kg	6.4	17	1.2	1.0	4.3
Zinc	mg/kg	96	110	72	43	45

Metals in Soil by ICP-OES						
Our Reference:	UNITS	SE88232-7	SE88232-8	SE88232-1	SE88232-1	SE88232-1
				4	5	8
Your Reference		SS05	SS06	SS11	SS12	SS15
Depth		0.0m -				
		0.10m	0.10m	0.10m	0.10m	0.10m
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		9/06/2011	9/06/2011	9/06/2011	9/06/2011	9/06/2011
Date Extracted (Metals)		16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011
Date Analysed (Metals)		16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011
Arsenic	mg/kg	3	17	4	4	4
Cadmium	mg/kg	<0.3	0.8	<0.3	<0.3	<0.3
Chromium	mg/kg	18	30	14	18	12
Copper	mg/kg	54	31	3.0	35	26
Lead	mg/kg	22	16	8	34	28
Nickel	mg/kg	5.8	9.5	1.1	7.5	7.6
Zinc	mg/kg	62	89	12	70	130



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Metals in Soil by ICP-OES		
Our Reference:	UNITS	SE88232-2
		0
Your Reference		SS17
Depth		0.0m -
		0.10m
Sample Matrix		Soil
Date Sampled		9/06/2011
Date Extracted (Metals)		16/06/2011
Date Analysed (Metals)		16/06/2011
Arsenic	mg/kg	4
Cadmium	mg/kg	<0.3
Chromium	mg/kg	16
Copper	mg/kg	36
Lead	mg/kg	17
Nickel	mg/kg	8.6
Zinc	mg/kg	100



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Mercury Cold Vapor/Hg Analyser						
Our Reference:	UNITS	SE88232-2	SE88232-3	SE88232-4	SE88232-5	SE88232-6
Your Reference		SS01	SS02	SS03	QA11	SS04
Depth		0.0m - 0.10m				
Sample Matrix Date Sampled		Soil 9/06/2011	Soil 9/06/2011	Soil 9/06/2011	Soil 9/06/2011	Soil 9/06/2011
Date Extracted (Mercury)		16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011
Date Analysed (Mercury)		16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011
Mercury	mg/kg	<0.05	<0.05	0.16	0.16	<0.05

Mercury Cold Vapor/Hg Analyser						
Our Reference:	UNITS	SE88232-7	SE88232-8	SE88232-1	SE88232-1	SE88232-1
				4	5	8
Your Reference		SS05	SS06	SS11	SS12	SS15
Depth		0.0m -				
		0.10m	0.10m	0.10m	0.10m	0.10m
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		9/06/2011	9/06/2011	9/06/2011	9/06/2011	9/06/2011
Date Extracted (Mercury)		16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011
Date Analysed (Mercury)		16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011
Mercury	mg/kg	<0.05	<0.05	<0.05	<0.05	0.07

Mercury Cold Vapor/Hg Analyser		
Our Reference:	UNITS	SE88232-2
		0
Your Reference		SS17
Depth		0.0m -
		0.10m
Sample Matrix		Soil
Date Sampled		9/06/2011
Date Extracted (Mercury)		16/06/2011
Date Analysed (Mercury)		16/06/2011
Mercury	mg/kg	<0.05



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Asbestos ID in soil						
Our Reference:	UNITS	SE88232-2	SE88232-3	SE88232-4	SE88232-6	SE88232-7
Your Reference		SS01	SS02	SS03	SS04	SS05
Depth		0.0m -				
		0.10m	0.10m	0.10m	0.10m	0.10m
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		9/06/2011	9/06/2011	9/06/2011	9/06/2011	9/06/2011
Date Analysed		20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011
Sample Description		37g	40g	62g	35g	30g
		Soil,rocks	Soil,rocks	Soil,rocks	Soil,rocks	Soil,rocks
Asbestos ID in soil	-	No	No	No	No	No
		asbestos	asbestos	asbestos	asbestos	asbestos
		detected	detected	detected	detected	detected
		Organic	Organic	Organic	Organic	Organic
		fibres	fibres	fibres	fibres	fibres
		detected	detected	detected	detected	detected

Asbestos ID in soil						
Our Reference:	UNITS	SE88232-8	SE88232-1	SE88232-1	SE88232-1	SE88232-2
			4	5	8	0
Your Reference		SS06	SS11	SS12	SS15	SS17
Depth		0.0m -				
		0.10m	0.10m	0.10m	0.10m	0.10m
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		9/06/2011	9/06/2011	9/06/2011	9/06/2011	9/06/2011
Date Analysed		20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011
Sample Description		20g	38g	24g	15g	19g
		Soil,rocks	Soil,rocks	Soil,rocks	Clay,rocks	clay,rocks
Asbestos ID in soil	-	No	No	No	No	No
		asbestos	asbestos	asbestos	asbestos	asbestos
		detected	detected	detected	detected	detected
		Organic	Organic	Organic	Organic	Organic
		fibres	fibres	fibres	fibres	fibres
		detected	detected	detected	detected	detected



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OC Pesticides in Water		
Our Reference:	UNITS	SE88232-1
Your Reference		R01
Depth		-
Sample Matrix		Water
Date Sampled		9/06/2011
Date Extracted		15/06/2011
Date Analysed		15/06/2011
НСВ	µg/L	<0.2
alpha-BHC	µg/L	<0.2
gamma-BHC(Lindane)	µg/L	<0.2
Heptachlor	µg/L	<0.2
Aldrin	µg/L	<0.2
beta-BHC	µg/L	<0.2
delta-BHC	µg/L	<0.2
Heptachlor Epoxide	µg/L	<0.2
o,p-DDE	µg/L	<0.2
alpha-Endosulfan	µg/L	<0.2
trans-Chlordane	µg/L	<0.2
<i>cis</i> -Chlordane	µg/L	<0.2
trans-Nonachlor	µg/L	<0.2
p,p-DDE	µg/L	<0.2
Dieldrin	µg/L	<0.2
Endrin	µg/L	<0.2
o,p-DDD	µg/L	<0.2
o,p-DDT	µg/L	<0.2
beta-Endosulfan	µg/L	<0.2
p,p-DDD	µg/L	<0.2
p,p-DDT	µg/L	<0.2
Endosulfan Sulphate	µg/L	<0.2
Endrin Aldehyde	µg/L	<0.2
Methoxychlor	µg/L	<0.2
Endrin Ketone	µg/L	<0.2
2,4,5,6-Tetrachloro-m-xylene (Surrogate	%	64



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| Trace HM (ICP-MS)-Dissolved | | |
|-------------------------------|-------|------------|
| Our Reference: | UNITS | SE88232-1 |
| Your Reference | | R01 |
| Depth | | - |
| Sample Matrix | | Water |
| Date Sampled | | 9/06/2011 |
| Date Extracted (Metals-ICPMS) | | 15/06/2011 |
| Date Analysed (Metals-ICPMS) | | 15/06/2011 |
| Arsenic | µg/L | <1 |
| Cadmium | µg/L | <0.1 |
| Chromium | µg/L | <1 |
| Copper | µg/L | <1 |
| Lead | µg/L | <1 |
| Nickel | µg/L | <1 |
| Zinc | µg/L | 37 |



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Mercury Cold Vapor/Hg Analyser		
Our Reference:	UNITS	SE88232-1
Your Reference		R01
Depth		-
Sample Matrix		Water
Date Sampled		9/06/2011
Date Extracted (Mercury)		16/06/2011
Date Analysed (Mercury)		16/06/2011
Mercury (Dissolved)	mg/L	<0.0001



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Moisture						
Our Reference:	UNITS	SE88232-2	SE88232-3	SE88232-4	SE88232-5	SE88232-6
Your Reference		SS01	SS02	SS03	QA11	SS04
Depth		0.0m -				
		0.10m	0.10m	0.10m	0.10m	0.10m
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		9/06/2011	9/06/2011	9/06/2011	9/06/2011	9/06/2011
Date Analysed (moisture)		16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011
Moisture	%	3	3	13	12	23

Moisture Our Reference:	UNITS	SE88232-7	SE88232-8	SE88232-1 4	SE88232-1 5	SE88232-1 8
Your Reference		SS05	SS06	SS11	SS12	SS15
Depth		0.0m - 0.10m				
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		9/06/2011	9/06/2011	9/06/2011	9/06/2011	9/06/2011
Date Analysed (moisture)		16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011
Moisture	%	16	33	19	40	47

Moisture		
Our Reference:	UNITS	SE88232-2
		0
Your Reference		SS17
Depth		0.0m -
		0.10m
Sample Matrix		Soil
Date Sampled		9/06/2011
Date Analysed (moisture)		16/06/2011
Moisture	%	49



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Method ID	Methodology Summary
AN410	BTEX / C6-C9 Hydrocarbons - Soil samples are extracted with methanol, purged and concentrated by a purge and trap apparatus, and then analysed using GC/MS technique. Water samples undergo the same analysis without the extraction step. Based on USEPA 5030B and 8260B.
AN400	The determination of organochlorine (OC) and organophosphorus (OP) pesticides and polychlorinated biphenyls (PCBs) in soils, sludges and groundwater. (Based on USEPA methods 3510, 3550, 8140 and 8080.)
AN320	Determination of elements by ICP-OES following appropriate sample preparation / digestion process. Based on USEPA 6010C / APHA 21st Edition, 3120B.
AN312	After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN602	Analysed using in house method AN602 - Qualitative identification of Asbestos Fibres, Synthetic Mineral Fibres and Organic Fibres in bulk samples (including building materials and soils) using Polarised Light Microscopy and Dispersion Staining Techniques. This method complies with AS4964-2004: Method for the Qualitative Identification of Asbestos in Bulk Samples.
AN318	Determination of elements at trace level in waters by ICP-MS technique, in accordance with USEPA 6020A.
AN002	



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REPORT NO: SE88232

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
BTEX in Soil						Base + Duplicate + %RPD		Duplicate + %RPD
Date Extracted (BTEX)				16/06/1 1	[NT]	[NT]	LCS	16/06/11
Date Analysed (BTEX)				17/06/1 1	[NT]	[NT]	LCS	17/06/11
Benzene	mg/kg	0.1	AN410	<0.1	[NT]	[NT]	LCS	123%
Toluene	mg/kg	0.1	AN410	<0.1	[NT]	[NT]	LCS	123%
Ethylbenzene	mg/kg	0.1	AN410	<0.1	[NT]	[NT]	LCS	124%
Total Xylenes	mg/kg	0.3	AN410	<0.3	[NT]	[NT]	LCS	122%
BTEX Surrogate (%)	%	0	AN410	100	[NT]	[NT]	LCS	105%

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
OC Pesticides in Soil						Base + Duplicate + %RPD		Duplicate + %RPD
Date Extracted				16/06/2 011	SE88232-2	16/06/2011 16/06/2011	SE88232-3	16/06/2011
Date Analysed				16/06/2 011	SE88232-2	16/06/2011 16/06/2011	SE88232-3	16/06/2011
HCB	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	[NR]	[NR]
gamma-BHC (Lindane)	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	[NR]	[NR]
Heptachlor	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	SE88232-3	128%
Aldrin	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	SE88232-3	117%
beta-BHC	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	[NR]	[NR]
delta-BHC	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	SE88232-3	106%
Heptachlor Epoxide	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	[NR]	[NR]
o,p-DDE	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	[NR]	[NR]
alpha-Endosulfan	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	[NR]	[NR]
trans-Chlordane (gamma)	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	[NR]	[NR]
<i>cis</i> -Chlordane <i>(alpha)</i>	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	[NR]	[NR]
trans-Nonachlor	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	[NR]	[NR]
p,p-DDE	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	[NR]	[NR]
Dieldrin	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	SE88232-3	114%
Endrin	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	SE88232-3	127%
o,p-DDD	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	[NR]	[NR]
o,p-DDT	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	[NR]	[NR]
beta-Endosulfan	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	[NR]	[NR]
p,p-DDD	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	[NR]	[NR]
<i>p,p</i> -DDT	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	SE88232-3	120%



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REPORT NO: SE88232

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
OC Pesticides in Soil						Base + Duplicate + %RPD		Duplicate + %RPD
Endosulfan Sulphate	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	[NR]	[NR]
Methoxychlor	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	[NR]	[NR]
Endrin Ketone	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	[NR]	[NR]
2,4,5,6-Tetrachloro-m-xy lene (Surrogate	%	0	AN400	91	SE88232-2	101 100 RPD: 1	SE88232-3	122%

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
PCBs in Soil						Base + Duplicate + %RPD		Duplicate + %RPD
Date Extracted				16/06/2 011	SE88232-2	16/06/2011 16/06/2011	SE88232-4	16/06/2011
Date Analysed				16/06/2 011	SE88232-2	16/06/2011 16/06/2011	SE88232-4	16/06/2011
Arochlor 1016	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	[NR]	[NR]
Arochlor 1221	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	[NR]	[NR]
Arochlor 1232	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	[NR]	[NR]
Arochlor 1242	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	[NR]	[NR]
Arochlor 1248	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	[NR]	[NR]
Arochlor 1254	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	[NR]	[NR]
Arochlor 1260	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	SE88232-4	127%
Arochlor 1262	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	[NR]	[NR]
Arochlor 1268	mg/kg	0.1	AN400	<0.1	SE88232-2	<0.1 <0.1	[NR]	[NR]
Total Positive PCB	mg/kg	0.9	AN400	<0.90	SE88232-2	<0.90 <0.90	[NR]	[NR]
PCB_Surrogate 1	%	0	AN400	91	SE88232-2	101 100 RPD: 1	SE88232-4	117%



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SGS Australia Pty Ltd ABN 44 000 964 278

REPORT NO: SE88232

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
Metals in Soil by ICP-OES						Base + Duplicate + %RPD		Duplicate + %RPD
Date Extracted (Metals)				16/06/2 011	SE88232-2	16/06/2011 16/06/2011	SE88232-3	16/06/2011
Date Analysed (Metals)				16/06/2 011	SE88232-2	16/06/2011 16/06/2011	SE88232-3	16/06/2011
Arsenic	mg/kg	3	AN320	<3	SE88232-2	<3 <3	SE88232-3	91%
Cadmium	mg/kg	0.3	AN320	<0.3	SE88232-2	<0.3 <0.3	SE88232-3	87%
Chromium	mg/kg	0.3	AN320	<0.3	SE88232-2	22 28 RPD: 24	SE88232-3	103%
Copper	mg/kg	0.5	AN320	<0.5	SE88232-2	82 66 RPD: 22	SE88232-3	100%
Lead	mg/kg	1	AN320	<1	SE88232-2	17 15 RPD: 12	SE88232-3	89%
Nickel	mg/kg	0.5	AN320	<0.5	SE88232-2	6.4 5.8 RPD: 10	SE88232-3	105%
Zinc	mg/kg	0.5	AN320	<0.5	SE88232-2	96 86 RPD: 11	SE88232-3	98%

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
Mercury Cold Vapor/Hg						Base + Duplicate +		Duplicate + %RPD
Analyser						%RPD		
Date Extracted (Mercury)				16/06/2 011	SE88232-2	16/06/2011 16/06/2011	SE88232-3	16/06/2011
Date Analysed				16/06/2	SE88232-2	16/06/2011	SE88232-3	16/06/2011
(Mercury)				011		16/06/2011		
Mercury	mg/kg	0.05	AN312	<0.05	SE88232-2	<0.05 <0.05	SE88232-3	100%

QUALITY CONTROL	UNITS	LOR	METHOD	Blank
Asbestos ID in soil				
Date Analysed				[NT]

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
OC Pesticides in Water						Base + Duplicate + %RPD		Duplicate + %RPD
Date Extracted				15/06/2 011	[NT]	[NT]	LCS	15/06/2011
Date Analysed				15/06/2 011	[NT]	[NT]	LCS	15/06/2011
НСВ	µg/L	0.2	AN400	<0.2	[NT]	[NT]	[NR]	[NR]
alpha-BHC	µg/L	0.2	AN400	<0.2	[NT]	[NT]	[NR]	[NR]
gamma-BHC(Lindane)	µg/L	0.2	AN400	<0.2	[NT]	[NT]	[NR]	[NR]
Heptachlor	µg/L	0.2	AN400	<0.2	[NT]	[NT]	LCS	94%
Aldrin	µg/L	0.2	AN400	<0.2	[NT]	[NT]	LCS	86%
beta-BHC	µg/L	0.2	AN400	<0.2	[NT]	[NT]	[NR]	[NR]
delta-BHC	µg/L	0.2	AN400	<0.2	[NT]	[NT]	LCS	76%



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REPORT NO: SE88232

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
OC Pesticides in Water						Base + Duplicate + %RPD		Duplicate + %RPD
Heptachlor Epoxide	µg/L	0.2	AN400	<0.2	[NT]	[NT]	[NR]	[NR]
o,p-DDE	µg/L	0.2	AN400	<0.2	[NT]	[NT]	[NR]	[NR]
alpha-Endosulfan	µg/L	0.2	AN400	<0.2	[NT]	[NT]	[NR]	[NR]
trans-Chlordane	µg/L	0.2	AN400	<0.2	[NT]	[NT]	[NR]	[NR]
cis-Chlordane	µg/L	0.2	AN400	<0.2	[NT]	[NT]	[NR]	[NR]
trans-Nonachlor	µg/L	0.2	AN400	<0.2	[NT]	[NT]	[NR]	[NR]
p,p-DDE	µg/L	0.2	AN400	<0.2	[NT]	[NT]	[NR]	[NR]
Dieldrin	µg/L	0.2	AN400	<0.2	[NT]	[NT]	LCS	76%
Endrin	µg/L	0.2	AN400	<0.2	[NT]	[NT]	LCS	87%
o,p-DDD	µg/L	0.2	AN400	<0.2	[NT]	[NT]	[NR]	[NR]
o,p-DDT	µg/L	0.2	AN400	<0.2	[NT]	[NT]	[NR]	[NR]
beta-Endosulfan	µg/L	0.2	AN400	<0.2	[NT]	[NT]	[NR]	[NR]
p,p-DDD	µg/L	0.2	AN400	<0.2	[NT]	[NT]	[NR]	[NR]
p,p-DDT	µg/L	0.2	AN400	<0.2	[NT]	[NT]	LCS	87%
Endosulfan Sulphate	µg/L	0.2	AN400	<0.2	[NT]	[NT]	[NR]	[NR]
Endrin Aldehyde	µg/L	0.2	AN400	<0.2	[NT]	[NT]	[NR]	[NR]
Methoxychlor	µg/L	0.2	AN400	<0.2	[NT]	[NT]	[NR]	[NR]
Endrin Ketone	µg/L	0.2	AN400	<0.2	[NT]	[NT]	[NR]	[NR]
2,4,5,6-Tetrachloro-m-xy lene (Surrogate	%	0	AN400	97	[NT]	[NT]	LCS	97%

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
Trace HM (ICP-MS)-Dissolved						Base + Duplicate + %RPD		Duplicate + %RPD
Date Extracted (Metals-ICPMS)				15/06/2 011	[NT]	[NT]	LCS	15/06/2011
Date Analysed (Metals-ICPMS)				15/06/2 011	[NT]	[NT]	LCS	15/06/2011
Arsenic	µg/L	1	AN318	<1	[NT]	[NT]	LCS	94%
Cadmium	µg/L	0.1	AN318	<0.1	[NT]	[NT]	LCS	103%
Chromium	µg/L	1	AN318	<1	[NT]	[NT]	LCS	94%
Copper	µg/L	1	AN318	<1	[NT]	[NT]	LCS	98%
Lead	µg/L	1	AN318	<1	[NT]	[NT]	LCS	100%
Nickel	µg/L	1	AN318	<1	[NT]	[NT]	LCS	98%
Zinc	µg/L	1	AN318	<1	[NT]	[NT]	LCS	99%



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SGS Australia Pty Ltd ABN 44 000 964 278

REPORT NO: SE88232

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
Mercury Cold Vapor/Hg Analyser						Base + Duplicate + %RPD		Duplicate + %RPD
Date Extracted (Mercury)				16/06/2 011	[NT]	[NT]	LCS	16/06/2011
Date Analysed (Mercury)				16/06/2 011	[NT]	[NT]	LCS	16/06/2011
Mercury (Dissolved)	mg/L	0.0001	AN312	<0.000 1	[NT]	[NT]	LCS	109%

QUALITY CONTROL Hold sample- NO test	UNITS	LOR	METHOD	Blank
Sample on HOLD		[NT]		[NT]

QUALITY CONTROL	UNITS	LOR	METHOD	Blank
Moisture				
Date Analysed (moisture)				[NT]
Moisture	%	1	AN002	<1

QUALITY CONTROL OC Pesticides in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date Extracted		SE88232-2 0	16/06/2011 16/06/2011
Date Analysed		SE88232-2 0	16/06/2011 16/06/2011
НСВ	mg/kg	SE88232-2 0	<0.1 <0.1
alpha-BHC	mg/kg	SE88232-2 0	<0.1 <0.1
gamma-BHC (Lindane)	mg/kg	SE88232-2 0	<0.1 <0.1
Heptachlor	mg/kg	SE88232-2 0	<0.1 <0.1
Aldrin	mg/kg	SE88232-2 0	<0.1 <0.1
beta-BHC	mg/kg	SE88232-2 0	<0.1 <0.1
delta-BHC	mg/kg	SE88232-2 0	<0.1 <0.1
Heptachlor Epoxide	mg/kg	SE88232-2 0	<0.1 <0.1



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QUALITY CONTROL	UNITS	Dup. Sm#	Duplicate
OC Pesticides in Soil			Base + Duplicate + %RPD
o,p-DDE	mg/kg	SE88232-2 0	<0.1 <0.1
<i>alpha-</i> Endosulfan	mg/kg	SE88232-2 0	<0.1 <0.1
<i>trans</i> -Chlordane <i>(gamma)</i>	mg/kg	SE88232-2 0	<0.1 <0.1
<i>cis-</i> Chlordane <i>(alpha)</i>	mg/kg	SE88232-2 0	<0.1 <0.1
trans-Nonachlor	mg/kg	SE88232-2 0	<0.1 <0.1
p,p-DDE	mg/kg	SE88232-2 0	<0.1 <0.1
Dieldrin	mg/kg	SE88232-2 0	<0.1 <0.1
Endrin	mg/kg	SE88232-2 0	<0.1 <0.1
o,p-DDD	mg/kg	SE88232-2 0	<0.1 <0.1
o,p-DDT	mg/kg	SE88232-2 0	<0.1 <0.1
<i>beta-</i> Endosulfan	mg/kg	SE88232-2 0	<0.1 <0.1
<i>p,p</i> -DDD	mg/kg	SE88232-2 0	<0.1 <0.1
<i>р,р-</i> DDT	mg/kg	SE88232-2 0	<0.1 <0.1
Endosulfan Sulphate	mg/kg	SE88232-2 0	<0.1 <0.1
Endrin Aldehyde	mg/kg	SE88232-2 0	<0.1 <0.1
Methoxychlor	mg/kg	SE88232-2 0	<0.1 <0.1
Endrin Ketone	mg/kg	SE88232-2 0	<0.1 <0.1
2,4,5,6-Tetrachloro-m-xylen e (Surrogate	%	SE88232-2 0	120 123 RPD: 2



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QUALITY CONTROL	UNITS	Dup. Sm#	Duplicate
PCBs in Soil			Base + Duplicate + %RPD
Date Extracted		SE88232-2 0	16/06/2011 16/06/2011
Date Analysed		SE88232-2 0	16/06/2011 16/06/2011
Arochlor 1016	mg/kg	SE88232-2 0	<0.1 <0.1
Arochlor 1221	mg/kg	SE88232-2 0	<0.1 <0.1
Arochlor 1232	mg/kg	SE88232-2 0	<0.1 <0.1
Arochlor 1242	mg/kg	SE88232-2 0	<0.1 <0.1
Arochlor 1248	mg/kg	SE88232-2 0	<0.1 <0.1
Arochlor 1254	mg/kg	SE88232-2 0	<0.1 <0.1
Arochlor 1260	mg/kg	SE88232-2 0	<0.1 <0.1
Arochlor 1262	mg/kg	SE88232-2 0	<0.1 <0.1
Arochlor 1268	mg/kg	SE88232-2 0	<0.1 <0.1
Total Positive PCB	mg/kg	SE88232-2 0	<0.90 <0.90
PCB_Surrogate 1	%	SE88232-2 0	120 123 RPD: 2



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 Environmental Services
 Unit 16/33 Maddox Street
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 Australia

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QUALITY CONTROL	UNITS	Dup. Sm#	Duplicate
Metals in Soil by ICP-OES			Base + Duplicate + %RPD
Date Extracted (Metals)		SE88232-2 0	16/06/2011 16/06/2011
Date Analysed (Metals)		SE88232-2 0	16/06/2011 16/06/2011
Arsenic	mg/kg	SE88232-2 0	4 3 RPD: 29
Cadmium	mg/kg	SE88232-2 0	<0.3 <0.3
Chromium	mg/kg	SE88232-2 0	16 16 RPD: 0
Copper	mg/kg	SE88232-2 0	36 37 RPD: 3
Lead	mg/kg	SE88232-2 0	17 17 RPD: 0
Nickel	mg/kg	SE88232-2 0	8.6 8.6 RPD: 0
Zinc	mg/kg	SE88232-2 0	100 100 RPD: 0

QUALITY CONTROL	UNITS	Dup. Sm#	Duplicate
Mercury Cold Vapor/Hg Analyser			Base + Duplicate + %RPD
Date Extracted (Mercury)		SE88232-2 0	16/06/2011 16/06/2011
Date Analysed (Mercury)		SE88232-2 0	16/06/2011 16/06/2011
Mercury	mg/kg	SE88232-2 0	<0.05 <0.05

QUALITY CONTROL BTEX in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date Extracted (BTEX)		SE88232-6	16/06/2011 16/06/2011
Date Analysed (BTEX)		SE88232-6	17/06/2011 17/06/2011
Benzene	mg/kg	SE88232-6	<0.1 <0.1
Toluene	mg/kg	SE88232-6	<0.1 <0.1
Ethylbenzene	mg/kg	SE88232-6	<0.1 <0.1
Total Xylenes	mg/kg	SE88232-6	<0.3 <0.3
BTEX Surrogate (%)	%	SE88232-6	91 95 RPD: 4



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Result Codes

Report Comments
Sampled by the client

 [INS]
 :
 Insufficient Sample for this test

 [NR]
 :
 Not Requested

 [NT]
 :
 Not tested

 [LOR]
 :
 Limit of reporting

[RPD] : Relative Percentage Difference * : Not part of NATA Accreditation

[N/A] : Not Applicable

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

No respirable fibres detected using trace analysis technique.

Asbestos analysed by Approved Identifier Yusuf Kuthpudin. Samples analysed as received. Solid samples expressed on a dry weight basis. Date Organics extraction commenced: NATA Corporate Accreditation No. 2562, Site No 4354

Note: Test results are not corrected for recovery (excluding Air-toxics and Dioxins/Furans*) This document is issued by the Company subject to its General Conditions of Service (www.sgs.com/terms_and_conditions.htm). Attention is drawn to the limitations of liability, indemnification and jurisdictional issues established therein.

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Quality Control Protocol

Method Blank: An analyte free matrix to which all reagents are added in the same volume or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. A method blank is prepared every 20 samples.

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

Surrogate Spike: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. Surrogates are added to samples before extraction to monitor extraction efficiency and percent recovery in each sample.

Internal Standard: Added to all samples requiring analysis for organics (where relevant) or metals by ICP after the extraction/digestion process; the compounds/elements serve to give a standard of retention time and/or response, which is invariant from run-to-run with the instruments.

Laboratory Control Sample: A known matrix spiked with compound(s) representative of the target analytes. It is used to document laboratory performance. When the results of the matrix spike analysis indicates a potential problem due to the sample matrix itself, the LCS results are used to verify that the laboratory can perform the analysis in a clean matrix.

Matrix Spike: An aliquot of sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.

Quality Acceptance Criteria

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: http://www.au.sgs.com/sgs-mp-au-env-qu-022-qa-qc-plan-en-09.pdf



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SGS Australia Pty Ltd ABN 44 000 964 278



SAMPLE RECEIPT ADVICE (SRA)

15 June 2011

Client Details		Chris Appelkamp	Laboratory Det	ails	
Client Contact Address	:	Coffey Environments Pty Ltd Chris Appelkamp 118 Auburn Street Wollongong NSW 2500	Laboratory Manager Address	:	SGS Environmental Services Edward Ibrahim Unit 16, 33 Maddox Street Alexandria NSW 2015
Email Telephone Facsimile	:	chris_appelkamp@coffey.com 02 4201 1400 02 4201 1401	Email Telephone Facsimile	:	au.samplereceipt.sydney@sgs.com 61 2 8594 0400 61 2 8594 0499
Project Order Number Samples	:	ENAUWOLL04006AA 28718-28719 20 Soil, 1 Water	Report No No. of Samples Due Date	:	SE88232 21 21/06/2011
Date Instructions Received Sample Receipt Date	:	10/06/2011 14/06/2011			
Samples received in good orde Samples received without head Upon receipt sample temperatu Sample containers provided by Turnaround time requested	r dspac re :	: YES YES Cool : SGS : Standard	Samples received in correct contained Sufficient quantity supplied Cooling Method Samples clearly Labelled Completed documentation received	er:; : : :	YES YES Ice YES YES

Samples will be held for 1 month for water samples and 3 months for soil samples from date of receipt of samples, unless otherwise instructed.

Comments

Samples received 14/6/11 @ 2:00pm

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

The signed chain of custody will be returned to you with the original report.



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Client	:	Coffey Environments Pty Ltd	Report No	:	SE88232
Project	:	ENAUWOLL04006AA			

Summary of Samples and Requested Analysis

The table below represents SGS Environmental Service's understanding and interpretation of the customer supplied sample request.

Please indicate ASAP if your request differs from these details.

Testing shall commence immediately as per this table, unless the customer intervenes with a correction prior to testing. Note that a small X in the table below indicates some testing has not been requested in the package.

Sample No.	Description	Metals Prep & Inorganics - All	BTEX in Soil	OC Pesticides in Soil	PCBs in Soil	Metals in Soil by ICP-OES	Mercury Cold Vapor/Hg Analyser	Asbestos ID in soil	OC Pesticides in Water	Trace HM (ICP-MS)-Dissolved	Mercury Cold Vapor/Hg Analyser	Hold sample-NO test required	Moisture
1	R01	x							Х	Х	Х		
2	SS01	x	Х	Х	Х	Х	Х	Х					х
3	SS02	x	Х	Х	Х	Х	Х	Х					х
4	SS03	x	Х	Х	Х	Х	Х	Х					х
5	QA11	x	Х	Х	Х	Х	Х						Х
6	SS04	x	Х	Х	Х	Х	Х	Х					Х
7	SS05	x	Х	Х	Х	Х	Х	Х					х
8	SS06	x	Х	Х	Х	Х	Х	Х					Х
9	SS07											Х	
10	SS08											Х	
11	QA12											Х	
12	SS09											Х	
13	SS10											Х	
14	SS11	х	Х	Х	Х	Х	Х	Х					Х
15	SS12	х	Х	Х	Х	Х	Х	Х					Х
16	SS13											Х	
17	SS14											Х	
18	SS15	x	Х	Х	Х	Х	Х	Х					Х



Client Project	:	Coffey Envir ENAUWOLI	ronmen L04006/	its Pty Ltd AA		Repo	rt No	:	SE8823	2	
			- All			nalyser			olved	nalyser	uired

Sample No.	Description	Metals Prep & Inorganics	BTEX in Soil	OC Pesticides in Soil	PCBs in Soil	Metals in Soil by ICP-OES	Mercury Cold Vapor/Hg A	Asbestos ID in soil	OC Pesticides in Water	Trace HM (ICP-MS)-Diss	Mercury Cold Vapor/Hg A	Hold sample-NO test requ	Moisture
19	SS16											Х	
20	SS17	x	х	Х	х	Х	Х	Х					Х
21	QA10											Х	

Sample No.	Description
1	R01
2	SS01
3	SS02
4	SS03
5	QA11
6	SS04
7	SS05
8	SS06
9	SS07
10	SS08
11	QA12
12	SS09
13	SS10
14	SS11
15	SS12
16	SS13



SS14

SS15

SS16 SS17

QA10

17

18

19

20

21

SAMPLE RECEIPT ADVICE (SRA) - continued

Client : Coffey Environments Pty Ltd Project : ENAUWOLL04006AA				Report No	:	SE88232	
No.		2	0				
Sample I			nescubri				



YELLOW: If dispatched to interstate Lab, Lab to sign on receipt and fax back to Coffey. BLUE: To be returned with results.

vectived 101611

Special Laboratory Instructions:	0.0 - 0.1 /	Comments	Relinquished by:	Attention: Saeuple	Madness& WIT 16, 33 49 Phone No.) WIT 16, 33 49 Alexandr	coffey % cr
At per sheet ()	Sam	ole Matrix Container Type	Cannad	Receipt-	induce st induce st	nain of Custody
	11 01 410 25110 11 25110 11	Sample No.	Date: Time:	Project Manager: (report results to)	CHVUS APPR	Laboratory Quotation / Ord
	PAHs TPHs MAHs = Metals	Sampled BTEX	Received by:	nus Appellanup	ELEAND	er No:
	Beye Tolue Ethe Ocf MSBE	A cere My Anneses Required S.	1	Consignment Note No: 36703	Consigning Officer: Date Dispatched:	No:
	Sar Con on Ro	nple dition accelpt	Date: Time:	Å,		2°2



ANALYTICAL REPORT

1 July 2011

Coffey Environments Pty Ltd

118 Auburn Street Wollongong **NSW 2500**

Our Reference:

Attention:	Manuel Fernandez
Your Reference:	ENAUWOLL04006AA

SE88475 Samples: 26 Soils Received: 23/6/11

Preliminary Report Sent: Not Issued

These samples were analysed in accordance with your written instructions.

For and on Behalf of: SGS ENVIRONMENTAL SERVICES

Sample Receipt: **Production Manager:** Angela Mamalicos Huong Crawford

AU.SampleReceipt.Sydney@sgs.com Huong.Crawford@sgs.com

Results Approved and/or Authorised by:

Dong Liang

Inorganic/Metal Superviso

Huong Crawford

Metals Signatory



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SGS Australia Pty Ltd ABN 44 000 964 278

pHFOX / pHField(1:2soil:30% peroxide)						
Our Reference:	UNITS	SE88475-1	SE88475-3	SE88475-4	SE88475-5	SE88475-6
Your Reference		CTP08	CTP09	CTP09	CTP09	CTP09
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth		0.5-0.7m	0.5-0.7m	1.0-1.2m	1.5-1.7m	2.0-2.2m
Date Sampled		21/06/2011	21/06/2011	21/06/2011	21/06/2011	21/06/2011
Date Extracted (pH 1:2 Soil: H2O2)*		30/06/2011	30/06/2011	30/06/2011	30/06/2011	30/06/2011
Date Analysed (pH 1:2 Soil: H2O2)*		30/06/2011	30/06/2011	30/06/2011	30/06/2011	30/06/2011
pHFox (1:2soil:30%peroxide)	pH Units	4.6	4.1	4.6	4.7	4.7
Date Extracted- (pH 1:2 soil: Water)*		30/06/2011	30/06/2011	30/06/2011	30/06/2011	30/06/2011
Date Analysed (pH 1:2 Soil: Water)*		30/06/2011	30/06/2011	30/06/2011	30/06/2011	30/06/2011
pHF (1:2 soil:water)	pH Units	5.3	5.6	5.3	5.2	5.2
Field pH reaction		Х	Х	Х	Х	Х

pHFOX / pHField(1:2soil:30% peroxide)						
Our Reference:	UNITS	SE88475-7	SE88475-8	SE88475-9	SE88475-1	SE88475-1
					0	5
Your Reference		CTP12	CTP12	CTP12	CTP12	CTP14
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth		0.5-0.7m	1.0-1.2m	1.5-1.7m	2.0-2.2m	0.5-0.7
Date Sampled		21/06/2011	21/06/2011	21/06/2011	21/06/2011	22/06/2011
Date Extracted (pH 1:2 Soil: H2O2)*		30/06/2011	30/06/2011	30/06/2011	30/06/2011	30/06/2011
Date Analysed (pH 1:2 Soil: H2O2)*		30/06/2011	30/06/2011	30/06/2011	30/06/2011	30/06/2011
pHFox (1:2soil:30%peroxide)	pH Units	3.6	3.1	3.2	3.0	4.0
Date Extracted- (pH 1:2 soil: Water)*		30/06/2011	30/06/2011	30/06/2011	30/06/2011	30/06/2011
Date Analysed (pH 1:2 Soil: Water)*		30/06/2011	30/06/2011	30/06/2011	30/06/2011	30/06/2011
pHF (1:2 soil:water)	pH Units	5.1	4.2	4.2	4.0	4.8
Field pH reaction		Х	Х	Х	Х	Х

pHFOX / pHField(1:2soil:30% peroxide)						
Our Reference:	UNITS	SE88475-1	SE88475-2	SE88475-2	SE88475-2	SE88475-2
		7	0	1	2	3
Your Reference		CTP14	CTP16	CTP16	CTP16	CTP16
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth		1.5-1.7	0.5-0.7	1.0-1.2	1.5-1.7	2.0-2.2
Date Sampled		22/06/2011	22/06/2011	22/06/2011	22/06/2011	22/06/2011
Date Extracted (pH 1:2 Soil: H2O2)*		30/06/2011	30/06/2011	30/06/2011	30/06/2011	30/06/2011
Date Analysed (pH 1:2 Soil: H2O2)*		30/06/2011	30/06/2011	30/06/2011	30/06/2011	30/06/2011
pHFox (1:2soil:30%peroxide)	pH Units	3.9	4.5	4.8	5.1	5.3
Date Extracted- (pH 1:2 soil: Water)*		30/06/2011	30/06/2011	30/06/2011	30/06/2011	30/06/2011
Date Analysed (pH 1:2 Soil: Water)*		30/06/2011	30/06/2011	30/06/2011	30/06/2011	30/06/2011
pHF (1:2 soil:water)	pH Units	4.4	5.1	5.3	5.7	5.9
Field pH reaction		Х	XX	Х	Х	Х



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pHFOX / pHField(1:2soil:30% peroxide)		
Our Reference:	UNITS	SE88475-2
		4
Your Reference		CTP17
Sample Matrix		Soil
Depth		0.5-0.7
Date Sampled		22/06/2011
Date Extracted (pH 1:2 Soil: H2O2)*		30/06/2011
Date Analysed (pH 1:2 Soil: H2O2)*		30/06/2011
pHFox (1:2soil:30%peroxide)	pH Units	3.6
Date Extracted- (pH 1:2 soil: Water)*		30/06/2011
Date Analysed (pH 1:2 Soil: Water)*		30/06/2011
pHF (1:2 soil:water)	pH Units	5.6
Field pH reaction		XXX



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Moisture						
Our Reference:	UNITS	SE88475-1	SE88475-3	SE88475-4	SE88475-5	SE88475-6
Your Reference		CTP08	CTP09	CTP09	CTP09	CTP09
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth		0.5-0.7m	0.5-0.7m	1.0-1.2m	1.5-1.7m	2.0-2.2m
Date Sampled		21/06/2011	21/06/2011	21/06/2011	21/06/2011	21/06/2011
Date Analyzed (mainture)		20/06/2014	20/06/2014	00/00/0011	00/06/0014	20/06/2011
Date Analysed (moisture)		28/06/2011	28/06/2011	28/06/2011	28/06/2011	28/06/2011
Moisture	%	23	41	38	15	15

Moisture Our Reference:	UNITS	SE88475-7	SE88475-8	SE88475-9	SE88475-1 0	SE88475-1 5
Your Reference		CTP12	CTP12	CTP12	CTP12	CTP14
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth Date Sampled		0.5-0.7m 21/06/2011	1.0-1.2m 21/06/2011	1.5-1.7m 21/06/2011	2.0-2.2m 21/06/2011	0.5-0.7 22/06/2011
Date Analysed (moisture)		28/06/2011	28/06/2011	28/06/2011	28/06/2011	28/06/2011
Moisture	%	34	33	25	38	22

Moisture						
Our Reference:	UNITS	SE88475-1	SE88475-2	SE88475-2	SE88475-2	SE88475-2
		7	0	1	2	3
Your Reference		CTP14	CTP16	CTP16	CTP16	CTP16
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Depth		1.5-1.7	0.5-0.7	1.0-1.2	1.5-1.7	2.0-2.2
Date Sampled		22/06/2011	22/06/2011	22/06/2011	22/06/2011	22/06/2011
Date Analysed (moisture)		28/06/2011	28/06/2011	28/06/2011	28/06/2011	28/06/2011
Moisture	%	18	23	25	20	20

Moisture		
Our Reference:	UNITS	SE88475-2
		4
Your Reference		CTP17
Sample Matrix		Soil
Depth		0.5-0.7
Date Sampled		22/06/2011
Date Analysed (moisture)		28/06/2011
		20.00.2011
Moisture	%	30



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Method ID	Methodology Summary
AN104	pH's are measured on soil sample extracted with both deionised water and 30% hydrogen peroxide to assess the likelihood of acid sulphate soil.
	NOTE: Rate of Reaction: X - Slight Reaction XX - Moderate Reaction XXX - High Reaction XXXX - Very vigorous, gas evolution and heat generation.
AN002	



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QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate
pHFox / pHField(1:2soil:30% peroxide)						Base + Duplicate + %RPD
Date Extracted (pH 1:2 Soil: H2O2)*				[NT]	SE88475-2 2	30/06/2011 30/06/2011
Date Analysed (pH 1:2 Soil: H2O2)*				[NT]	SE88475-2 2	30/06/2011 30/06/2011
рНғох (1:2soil:30%peroxide)	pH Units		AN104	[NT]	SE88475-2 2	5.1 5.1 RPD: 0
Date Extracted- (pH 1:2 soil: Water)*				[NT]	SE88475-2 2	30/06/2011 30/06/2011
Date Analysed (pH 1:2 Soil: Water)*				[NT]	SE88475-2 2	30/06/2011 30/06/2011
pHF (1:2 soil:water)	pH Units		AN104	[NT]	SE88475-2 2	5.7 5.8 RPD: 2
Field pH reaction			AN104	[NT]	SE88475-2 2	X X

QUALITY CONTROL	UNITS	LOR	METHOD	Blank
Hold sample- NO test required				
Sample on HOLD		[NT]		[NT]

QUALITY CONTROL	UNITS	LOR	METHOD	Blank
Moisture				
Date Analysed (moisture)				[NT]
Moisture	%	1	AN002	[NT]



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Result Codes

[INS] Insufficient Sample for this test : [NR] Not Requested [NT] Not tested : [LOR] : Limit of reporting **Report Comments**

[RPD] : Relative Percentage Difference : Not part of NATA Accreditation

[N/A] : Not Applicable

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

Date Organics extraction commenced: NATA Corporate Accreditation No. 2562, Site No 4354

Note: Test results are not corrected for recovery (excluding Air-toxics and Dioxins/Furans*) This document is issued by the Company subject to its General Conditions of Service (www.sgs.com/terms_and_conditions.htm). Attention is drawn to the limitations of liability, indemnification and jurisdictional issues established therein.

This document is to be treated as an original within the meaning of UCP 600. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

Quality Control Protocol

Method Blank: An analyte free matrix to which all reagents are added in the same volume or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. A method blank is prepared every 20 samples.

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

Surrogate Spike: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. Surrogates are added to samples before extraction to monitor extraction efficiency and percent recovery in each sample.

Internal Standard: Added to all samples requiring analysis for organics (where relevant) or metals by ICP after the extraction/digestion process; the compounds/elements serve to give a standard of retention time and/or response, which is invariant from run-to-run with the instruments.

Laboratory Control Sample: A known matrix spiked with compound(s) representative of the target analytes. It is used to document laboratory performance. When the results of the matrix spike analysis indicates a potential problem due to the sample matrix itself, the LCS results are used to verify that the laboratory can perform the analysis in a clean matrix.

Matrix Spike: An aliquot of sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.

Quality Acceptance Criteria

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: http://www.au.sgs.com/sgs-mp-au-env-qu-022-ga-gc-plan-en-09.pdf



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Environmental Services Unit 16/33 Maddox Street Alexandria NSW 2015 Australia www.au.sgs.com

ABN 44 000 964 278



SAMPLE RECEIPT ADVICE (SRA)

30 June 2011

Client Details Requested By Client Contact Address	: Ma : Co : Ma : 11 Wo	anuel Fernandez offey Environments Pty Ltd anuel Fernandez 8 Auburn Street ollongong NSW 2500		Laboratory De Laboratory Manager Address	tails : :	SGS Environmental Services Edward Ibrahim Unit 16, 33 Maddox Street Alexandria NSW 2015
Email Telephone Facsimile	: ma : 02 : 02	anuel_fernandez@coffey.com 4201 1400 4201 1401		Email Telephone Facsimile	: : :	au.samplereceipt.sydney@sgs.com 61 2 8594 0400 61 2 8594 0499
Project Order Number Samples Date Instructions Received	: EN : 28 : 26	IAUWOLL04006AA 721-2 Soils /06/2011		Report No No. of Samples Due Date	:	SE88475 26 30/06/2011
Sample Receipt Date Samples received in good order Samples received without head Upon receipt sample temperatur Sample containers provided by Turnaround time requested	: 23	/6/11 YES N/A Cool Customer Standard	Samples received i Sufficient quantity s Cooling Method Samples clearly Lal Completed docume	in correct contair supplied belled entation received	ier:) : : :	YES YES Ice YES YES

Samples will be held for 1 month for water samples and 3 months for soil samples from date of receipt of samples, unless otherwise instructed.

Comments

ASS Screening is pH Fox

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

The signed chain of custody will be returned to you with the original report.



Ble Australio III V 100 | Unit 16, 33 Maddox Street Alexandria New South Wales 2015 t+61 (0)2 8594 0400 f+61 (0)2 85940499 www.au.sgs.com



Client	:	Coffey Environments Pty Ltd	Report No	:	SE88475
Project	:	ENAUWOLL04006AA			

Summary of Samples and Requested Analysis

The table below represents SGS Environmental Service's understanding and interpretation of the customer supplied sample request.

Please indicate ASAP if your request differs from these details.

Testing shall commence immediately as per this table, unless the customer intervenes with a correction prior to testing. Note that a small X in the table below indicates some testing has not been requested in the package.

Sample No.	Description	No Prep Required	pHFOX/F-1:2soil:30%peroxide*	Hold sample-NO test required	Moisture
1	CTP08	Х	Х		Х
2	CTP08			Х	
3	CTP09	Х	Х		Х
4	CTP09	Х	Х		Х
5	CTP09	Х	Х		Х
6	CTP09	Х	Х		Х
7	CTP12	Х	Х		Х
8	CTP12	Х	Х		Х
9	CTP12	Х	Х		Х
10	CTP12	Х	Х		Х
11	CTP13			Х	
12	CTP13			Х	
13	CTP13			Х	
14	CTP13			Х	
15	CTP14	Х	Х		Х
16	CTP14			Х	
17	CTP14	Х	Х		Х



Client	:	Coffey Environments Pty Ltd	Report No	:	SE88475
Project	:	ENAUWOLL04006AA			

Sample No.	Description	No Prep Required	pHFOX/F-1:2soil:30%peroxide*	Hold sample-NO test required	Moisture
18	CTP15			Х	
19	CTP15			Х	
20	CTP16	Х	Х		Х
21	CTP16	Х	Х		Х
22	CTP16	Х	Х		Х
23	CTP16	Х	Х		Х
24	CTP17	Х	Х		Х
25	CTP17			Х	
26	CTP17			Х	

Sample No.	Description
1	CTP08
2	CTP08
3	CTP09
4	CTP09
5	CTP09
6	CTP09
7	CTP12
8	CTP12
9	CTP12
10	CTP12



Client Project	:	Coffey Environments Pty Ltd ENAUWOLL04006AA	Report No	:	SE88475	

Sample No.	Description
11	CTP13
12	CTP13
13	CTP13
14	CTP13
15	CTP14
16	CTP14
17	CTP14
18	CTP15
19	CTP15
20	CTP16
21	CTP16
22	CTP16
23	CTP16
24	CTP17
25	CTP17
26	CTP17

coffey?	Chain of Custody	Laboratory Quotation / Q	der No:	ENAumonoho	Shouth Sheet of 2	
Dispatch to: Address & SGS EW	WRONTHENTAL	sampled by: Others Appel	kan p	Consigning Officer: Date Dispatched:	3/6/2011	
Attention: Scemple R	eccipt	Project Manager: (report results to) Manuel Fe	innanclez_	Courier Service: M	31	
Relinauished by:		Date; Time:	Received by:		Date: // Tim	91
CHUL ARECKAN	N.C.	1/9/62			K.C 23/6	9:000
	×		t	Analyses Reo	uired	
Comments	Sample Matrix Container Type and Preservative	Sample No.	Date Sampled PAHs TPHs MAHs = BTEX	Motals: ASS Scree	Connuls	Condition on Receipt
0.5-0.7 M	(oil Barg/gladwig)	CP08	24/6/11			
1.0 - 1.2 M	1 010	11 11				
0.5 - 0.7M		Croad		X	The state of the s	
1.0 + 1-2 M		14 1		<u> </u>		
1.5 - 1.7 M		ci ll			1 1 aven 23/6/11	
2.0-2.2m		11 11		1	ar C	
0.5-0.7M		51970			Samples Intest	
1.0 - 1.2m		11 1			Cooler Pack	
1.5 - 1. Tm		11 11	3	~	emperature on Receip 2.9	
2.0 - 2.2m		11 11	4	\ \	The manual of the	10
L:01 Y0		CTP13	22/6/14		004	10
1.0 - 1.2		N N	11 1 11			
1.5-(-7		11 Ir	11 11 II			
2.0 - 2.2		10 10	10 10			
L-0-5.0		CTP 14	22/6/11	×		
1.0 -1-2		11 11	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
1.1.2	¢	K (C	11 11	1		
Special Laboratory Instructions:			>	1.		
Datastina Limiter		Turney and Bandison	oc 14 by 20	16	REFERENCED (DAGES
etection Limits:		Turnaround Required:		1	/	SUBSEQUENT

TE: Sign on release. YELLOW; if dispatched to interstate Lab. Lab to sign on receipt and fax back to Coffey, BLUE: To be returned

AU.SampleReceipt.Sydney (Sydney)

From:Blackman, Daniel (Sydney)Sent:Tuesday, 28 June 2011 9:42 AMTo:AU.SampleReceipt.Sydney (Sydney)Cc:chris_appelkamp@coffey.comSubject:SE88475 - ENAUWOLL04006AA

Following instruction from Chris Appelkamp the customer project number is now corrected to ENAUWOLL04006AA in line with the project number on page 2 of the CoC. No need to re-issue the SRA.

Regards, Daniel Blackman Environmental Services Client Services Officer

SGS Australia Pty Ltd Unit 16, 33 Maddox St Alexandria, NSW, 2015 Phone: +61 (0)2 8594 0400 Fax: +61 (0)2 8594 0499 E-mail: daniel.blackman@sgs.com

SGS DataNet: View Results Online

Appendix F Laboratory Reports – Acid Sulfate Soil Testing

ACID SULFATE SOIL, CONTAMINATION AND GEOTECHNICAL INVESTIGATION BOMADERRY NSW

TABLE F1: SUMMARY OF ASS LABORATORY RESULTS FOR ASS SAMPLES

Sample ID		CTP08	CTP09	CTP09	CTP09	CTP09	CTP12	CTP12	CTP12	CTP12	CTP14	CTP14	CTP16	CTP16	CTP16	CTP16	CTP16	CTP17	CTP18	CTP18
Unit		ALLUVIAL																		
Texture Category		FINE																		
Date of Sampling																				
Depth (m)	Action Criteria	0.5-0.7m	0.5-0.7m	1.0-1.2m	1.5-1.7m	2.0-2.2m	0.5-0.7m	1.0-1.2m	1.5-1.7m	2.0-2.2m	0.5-0.7	1.5-1.7	0.5-0.7	1.0-1.2	1.5-1.7	1.5-1.7	2.0-2.2	0.5-0.7	0.5-0.6	1.0-1.1
pH _F		5.3	5.6	5.3	5.2	5.2	5.1	4.2	4.2	4.0	4.8	4.4	5.1	5.3	5.7	5.8	5.9	5.6	6.3	5.6
pH _{FOX}		4.6	4.1	4.6	4.7	4.7	3.6	3.1	3.2	3	4	3.9	4.5	4.8	5.1	5.1	5.3	3.6	3.4	3.4
pH Shift		0.7	1.5	0.7	0.5	0.5	1.5	1.1	1.0	1.0	0.8	0.5	0.6	0.5	0.6	0.7	0.6	2.0	2.9	2.2
Observed Reaction		х	х	Х	Х	х	х	Х	Х	х	Х	х	XX	Х	Х	Х	Х	XXX	х	Х
pH KCl		-	4.30	-	-	-	-	4	4.20	3.90	-	4	4.1	-	-	-	-	4.6	-	-
TAA (moles H+/ tonne)*	18 ¹	-	160	-	-	-	-	150	81	180	-	74	62	-	-	-	-	66	-	-
S KCI (%)		-	<0.005	-	-	-	-	0.008	0.017	0.016	-	0.074	<0.005	-	-	-	-	NA	-	-
Scr (%)	0.03-18 ¹	-	0.034	-	-	-	-	0.012	0.008	0.015	-	< 0.005	< 0.005	-	-	-	-	0.006	-	-

Sample ID		CTP18	CTP18	CTP18	CTP18	CTP19	CTP19	CTP19	CTP19	CTP20	CTP20	CTP20	CTP21	CTP21	CTP21
Unit		ALLUVIAL													
Texture Category		FINE													
Date of Sampling															
Depth (m)	Action Criteria	1.0-1.1	1.5-1.6	2.0-2.1	2.5-2.6	0.5-0.6	1.0-1.1	1.5-1.6	2.0-2.1	0.5-0.6	1.0-1.1	1.5-1.6	0.5-0.6	0.5-0.6	1.0-1.1
pH _F		5.6	5.5	5.2	5.3	6	6.5	6.4	6.3	6.7	6.4	6.7	5.5	5.6	5.4
pH _{FOX}		3.4	3.8	3.9	3.9	2.8	2.8	3.2	5.5	3.4	4.2	5	5.2	5.3	3.8
pH Shift		2.2	1.7	1.3	1.4	3.2	3.7	3.2	0.8	3.3	2.2	1.7	0.3	0.3	1.6
Observed Reaction		Х	Х	Х	Х	Х	Х	Х	XXXX	Х	Х	Х	Х	XXXX	XXXX
pH KCl		-	-	-	-	-	4.7	4.8	4.90	4.8	-	-	-	5.1	-
TAA (moles H+/ tonne)*	18 ¹	-	-	-	-	-	42	34	26	47	-	-	-	17	-
S KCI (%)		-	-	-	-	-	NA	NA	NA	NA	-	-	-	NA	-
Scr (%)	0.03-18 ¹	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	-	-	-	<0.005	-

NOTES:

Concentration exceeds ASSMAC (1998) action level ¹ Based on ASSMAC (1998) Acid Sulfate Soil Manual dependant upon soil texture category. - Not Analysed pH_F Field pH (measured as received at the laboratory) pH_{rox} pH after oxidation with hydrogen peroxide ^{TAA} Total Actual Acidity ^{SKCL} Potasium chloride extractable sulfur ^{SKCL} Potasium chloride extractable sulfur ^{SKCL} Potasium chloride sulfur ^{SKCL} Potasium chloride sulfur ^{SKCL} Potasium chloride sulfur ^{SKCL} Actual Acidity ^{SKCL} Potasium chloride sulfur ^{SKCL} Potasium chlorid



LABORATORY REPORT COVERSHEET

Date: 17 May 2011

- To: Coffey Environmental Pty Ltd 118 Auburn St WOOLONGONG NSW 2500
- Attention: Chris Appelkamp

Your Reference:	ENAUWOLL04006AA
Laboratory Report No:	CE71935
Samples Received:	10/05/2011
Samples / Quantity:	14 Soils

The above samples were received intact and analysed according to your written instructions. Unless otherwise stated, solid samples are reported on a dry weight basis and liquid samples as received.

This Report must not be reproduced, except in full.

Jon Dicker Manager CAIRNS

Anthony Nilsson Operations Manager CAIRNS

Page 1 of 8


Laboratory Report No: CE71935

PH Field Our Reference Your Reference Type of Sample Date Sampled	Units	CE71935-1 CTP 21 0.5-0.6 Soil 4/05/2011	CE71935-2 CTP 21 1.0-1.1 Soil 4/05/2011	CE71935-3 CTP 20 0.5-0.6 Soil 4/05/2011
Date Extracted		16/05/2011	16/05/2011	16/05/2011
Date Analysed		16/05/2011	16/05/2011	16/05/2011
рН ғ #	pH Units	5.5	5.4	6.7
pH _{FOx} #	pH Units	5.2	3.8	3.4
Field pH reaction #		XXXX	Х	Х

PH Field Our Reference Your Reference Type of Sample Date Sampled	Units	CE71935-4 CTP 20 1.0-1.1 Soil 4/05/2011	CE71935-5 CTP 20 1.5-1.6 Soil 4/05/2011	CE71935-6 CTP 19 0.5-0.6 Soil 4/05/2011
Date Extracted		16/05/2011	16/05/2011	16/05/2011
Date Analysed		16/05/2011	16/05/2011	16/05/2011
рН _F #	pH Units	6.4	6.7	6.0
pH _{FOx} #	pH Units	4.2	5.0	2.8
Field pH reaction #		Х	Х	Х



Laboratory Report No: CE71935

PH Field Our Reference Your Reference Type of Sample Date Sampled	Units	CE71935-7 CTP 19 1.0-1.1 Soil 4/05/2011	CE71935-8 CTP 19 1.5-1.6 Soil 4/05/2011	CE71935-9 CTP 19 2.0-2.1 Soil 4/05/2011
Date Extracted		16/05/2011	16/05/2011	16/05/2011
Date Analysed		16/05/2011	16/05/2011	16/05/2011
рН ғ #	pH Units	6.5	6.4	6.3
pH FOx #	pH Units	2.8	3.2	5.5
Field pH reaction #		Х	X	XXXX

PH Field				
Our Reference	Units	CE71935-10	CE71935-11	CE71935-12
Your Reference		CTP 18 0.5-0.6	CTP 18 1.0-1.1	CTP 18 1.5-1.6
Type of Sample		Soil	Soil	Soil
Date Sampled		4/05/2011	4/05/2011	4/05/2011
Date Extracted		16/05/2011	16/05/2011	16/05/2011
Date Analysed		16/05/2011	16/05/2011	16/05/2011
рН ғ #	pH Units	6.3	5.6	5.5
pH _{FOx} #	pH Units	3.4	3.4	3.8
Field pH reaction #		X	Х	Х



Laboratory Report No: CE71935

PH Field Our Reference Your Reference Type of Sample Date Sampled	Units	CE71935-13 CTP 18 2.0-2.1 Soil 4/05/2011	CE71935-14 CTP 18 2.5-2.6 Soil 4/05/2011
Date Extracted		16/05/2011	16/05/2011
Date Analysed		16/05/2011	16/05/2011
рН	pH Units	5.2	5.3
pH _{FOx} #	pH Units	3.9	3.9
Field pH reaction #		Х	Х



Laboratory Report No: CE71935

TEST PARAMETERS	UNITS	LOR	METHOD
PH Field			
Date Extracted			
Date Analysed			
рН ғ #	pH Units	0.1	AN101
pH _{FOx} #	pH Units	0.1	AN101
Field pH reaction #			Other



Laboratory Report No: CE71935

QUALITY CONTROL	UNITS	Blank	Duplicate Sm#	Duplicate
				Sample Dupli cate
Date Extracted		[NT]	CE71935-1	16/05/2011 16/05/2011
Date Analysed		[NT]	CE71935-1	16/05/2011 16/05/2011
рН ғ #	pH Units	[NT]	CE71935-1	5.5 5.6 RPD: 2
pH FOx #	pH Units	[NT]	CE71935-1	5.2 5.3 RPD: 2
Field pH reaction #		[NT]	CE71935-1	XXXX XXXX



Laboratory Report No: CE71935

QUALTY CONTROL	UNITS	Blank	Duplicate Sm#	Duplicate
				Sample Duplicate
Date Extracted		[NT]	CE71935-11	16/05/2011 16/05/2011
Date Analysed		[NT]	CE71935-11	16/05/2011 16/05/2011
pH F #	pH Units	[NT]	CE71935-11	5.6 5.6 RPD: 0
pH _{FOx} #	pH Units	[NT]	CE71935-11	3.4 3.4 RPD: 0
Field pH reaction #		[NT]	CE71935-11	X X



Laboratory Report No: CE71935

LABORATORY REPORT

NOTES:

LOR - Limit of Reporting.

NOTE: Rate of Reaction:

- X Slight Reaction
- XX Moderate Reaction
- XXX High Reaction

XXXX - Very vigorous, gas evolution and heat generation, commonly >80°

Geneva Legal Comment

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ISO 17025

Unless otherwise stated the results shown in this test report only refer to the sample(s) tested and such sample(s) are only retained for 60 days only. This document cannot be reproduced except in full, without prior approval of the Company.

Analysis Date: Between 10/05/11 and 17/05/11

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LABORATORY REPORT COVERSHEET

Date: 4 July 2011

- To: Coffey Environmental Pty Ltd 118 Auburn St WOOLONGONG NSW 2500
- Attention: Chris Appelkamp

Your Reference:ENAUWOLL04006AALaboratory Report No:CE71935BSamples Received:10/05/2011Samples / Quantity:5 Soils

The above samples were received intact and analysed according to your written instructions. Unless otherwise stated, solid samples are reported on a dry weight basis and liquid samples as received.

Jon Dicker Manager CAIRNS

Anthony Nilsson Operations Manager CAIRNS



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Page 1 of 5



Laboratory Report No: CE71935B

LABORATORY REPORT

Chromium Suite - Acid Base				
Our Reference	Units	CE71935B-1	CE71935B-3	CE71935B-7
Your Reference		CTP 21 0.5-0.6	CTP 20 0.5-0.6	CTP 19 1.0-1.1
Type of Sample		Soil	Soil	Soil
Date Sampled		4/05/2011	4/05/2011	4/05/2011
Depth				
Date Extracted		30/06/2011	30/06/2011	30/06/2011
Date Analysed		31/06/11	31/06/11	31/06/11
Moisture	% w/w	16	29	24
рН ксі	pH Units	5.1	4.8	4.7
s-TAA pH 6.5	% w/w S	0.03	0.08	0.07
TAA pH 6.5	mole H ⁺ /t	17	47	42
Chromium Reducible Sulfur	% w/w	<0.005	<0.005	<0.005
(Scr)				
a-Chromium Reducible Sulfur	mole H ⁺ / t	<5	<5	<5
Sнсі	% w/w	NA	NA	NA
S ксі	% w/w	NA	NA	NA
S NAS	% w/w	NA	NA	NA
Acid Neutralisation Capacity	% CaCO3	NA	NA	NA
АМСвт				
S-ANCBT	% w/w S	NA	NA	NA
а-АМСвт	mole H ⁺ / t	NA	NA	NA
s-Net Acidity	% w/w S	0.03	0.08	0.07
a-Net Acidity	mole H ⁺ /t	19	50	44
Liming Rate	kg CaCO3/tonne	1.4	3.8	3.3
Verification s-Net Acidity	% w/w S	NA	NA	NA
a-Net Acidity without ANC	mole H ⁺ /t	19	50	44
Liming Rate without ANC	kg CaCO3/tonne	1.4	3.8	3.3



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Laboratory Report No: CE71935B

LABORATORY REPORT

Chromium Suite - Acid Base			
Accounting Our Reference	Units	CE71935B-8	CE71935B-9
Your Reference		CTP 19 1.5-1.6	CTP 19 2.0-2.1
Type of Sample		Soil	Soil
Date Sampled		4/05/2011	4/05/2011
Depth			
Date Extracted		30/06/2011	30/06/2011
Date Analysed		31/06/11	31/06/11
Moisture	% w/w	21	18
рН ксі	pH Units	4.8	4.9
s-TAA pH 6.5	% w/w S	0.05	0.04
TAA pH 6.5	mole H⁺/t	34	26
Chromium Reducible Sulfur	% w/w	<0.005	<0.005
(Scr)			
a-Chromium Reducible Sulfur	mole H ⁺ / t	<5	<5
Sнсі	% w/w	NA	NA
S ксі	% w/w	NA	NA
S NAS	% w/w	NA	NA
Acid Neutralisation Capacity	% CaCO3	NA	NA
АМСвт			
s-ANCBT	% w/w S	NA	NA
а-АМСвт	mole H ⁺ / t	NA	NA
s-Net Acidity	% w/w S	0.06	0.04
a-Net Acidity	mole H⁺/t	35	27
Liming Rate	kg CaCO3/tonne	2.6	2.0
Verification s-Net Acidity	% w/w S	NA	NA
a-Net Acidity without ANC	mole H ⁺ /t	35	27
Liming Rate without ANC	kg CaCO3/tonne	2.6	2.0



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Laboratory Report No: CE71935B

TEST PARAMETERS	UNITS	LOR	METHOD
Chromium Suite - Acid Base Accounting			
Date Extracted			
Date Analysed			
Moisture	% w/w	0.1	AN002 RL2A1
рН ксі	pH Units	0.1	AS4969.2 / AN219
s-TAA pH 6.5	% w/w S	0.01	AS4969.2 / AN219
TAA pH 6.5	mole H ⁺ /t	5	AS4969.2 / AN219
Chromium Reducible Sulfur (ScR)	% w/w	0.005	AS4969.7
a-Chromium Reducible Sulfur	mole H ⁺ / t	5	AS4969.7
Shci	% w/w	0.005	AS4969.8 / AN014
S ксі	% w/w	0.005	AS4969.4
S NAS	% w/w	0.005	AS4969.11
Acid Neutralisation Capacity ANCBT	% CaCO3	0.1	AN214
S-ANCBT	% w/w S	0.01	AS4969.13 / AN214
а-АМСвт	mole H ⁺ / t	5	AS4969.13 / AN214
s-Net Acidity	% w/w S	0.01	Calculation
a-Net Acidity	mole H ⁺ /t	5	Calculation
Liming Rate	kg CaCO3/tonne	0.1	AS4969.14 / AN220
Verification s-Net Acidity	% w/w S		Calculation
a-Net Acidity without ANC	mole H ⁺ /t	5	Calculation
Liming Rate without ANC	kg CaCO3/tonne	0.1	ASSMAC_23H

LABORATORY REPORT



Page 4 of 5



Laboratory Report No: CE71935B

LABORATORY REPORT

NOTES:

LOR - Limit of Reporting.

Liming rate calculated using a Fineness factor of 1.5 (which is equivalent to finely divided Ag Lime <0.5mm) and Neutralising Value (NV) of 100% If using Liming Material <100% NV, then Liming Rate can be adusted as follows: Actual Liming Rate equals Calculated Liming Rate times 100 divided by NV of actual Liming Material Bulk Density of Material of 1g/cm3 assumed. If Bulk Density differs from 1g/cm3 then Liming rate can be adjusted as follows: Actual Liming Rate equals Calculated Liming Rate times Actual Bulk Density Geneva Legal Comment

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ISO 17025

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Analysis Date: Between 30/06/11 and 4/07/11

Disclaimer:

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SAMPLE RECEIPT ADVICE (SRA)

30 June 2011

Client Details			Laboratory Deta	+tails		
Client	:	Coffey Environmental Pty Ltd	Laboratory	:	SGS Environmental Services	
Contact	:	Chris Appelkamp	Manager	:	Jon Dicker	
Address	:	118 Auburn St	Address	:	Unit 2, 58 Comport St	
		WOOLONGONG NSW 2500			Portsmith QLD 4870	
Email	:	chris_appelkamp@coffey.com	Email	:	Shey.Goddard@SGS.com	
Telephone	:	02 4201 1400	Telephone	:	61 7 4035 5111	
Facsimile	:	02 4201 1401	Facsimile	:	61 7 4035 5122	
Project	:	ENAUWOLL04006AA	Report No	:	СЕ71935-В	
Order Number	:		No. of Samples	:	14	
Samples	:	5 Soils	Due Date	:	7/07/2011	
Date Instructions Received	:	30/06/2011				
Sample Receipt Date	:	10/05/2011				
Requested By	:	Chris Appelkamp				
			0			
Samples received in good ord	ber	: Yes	Samples received in correct container	S:	Yes	
Samples received without he	auspa		Sumcient quantity supplied	:	res	
Opon receipt sample tempera	lure			-		
Sample containers provided t	by			:	Yes	
i urnaround time requested		: Standard	Completed documentation received	-	Yes, Chain of Custody Received	

Samples will be held for 1 month for water samples and 3 months for soil samples from date of receipt of samples, unless otherwise instructed.

Comments

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

The signed chain of custody will be returned to you with the original report.

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SAMPLE RECEIPT ADVICE (SRA) - continued

Client	:	Coffey Environmental Pty Ltd	Report No	:	СЕ71935-В
Project	:	ENAUWOLL04006AA			

Summary of Samples and Requested Analysis

The table below represents SGS Environmental Service's interpretation of the customer supplied Chain of Custody. Please indicate ASAP of your request differs from these details.

Testing shall commence immediately as per this table, unless the customer intervenes with a correction prior to testing. Note that a lowercase x in the table below indicates some testing has not been requested in the package.

Sample No.	Description	Chromium Suite - Acid Base Acc
1	CTP 21 0.5-0.6	Х
3	CTP 20 0.5-0.6	Х
7	CTP 19 1.0-1.1	Х
8	CTP 19 1.5-1.6	Х
9	CTP 19 2.0-2.1	Х

Nilsson, Anthony (Cairns)

From: Manuel Fernandez [Manuel_Fernandez@coffey.com]

Sent: Friday, 24 June 2011 4:05 PM

To: Nilsson, Anthony (Cairns)

Cc: Chris Appelkamp

Subject: Additional Analysis

Hi Anthony,

We would like to get some additional analysis on samples previously analysed by your laboratory (SGS Ref: CE71935, Coffey Ref: ENAUWOLL04006AA – received by SGS 10/5/2011) as follows:

Chromium reducible sulfur suite (including Skcl if there is any TAA, irrespective of pH):

CTP21 0.5-0.6 CTP20 0.5-0.6 CTP19 1.0-1.1 CTP19 1.5-1.6 CTP19 2.0-2.1

Kind Regards MANUEL FERNANDEZ Business Manager - Wollongong Senior Associate Environmental Engineer

Coffey Environments

118 Auburn Street Wollongong NSW 2500 Australia T +61 2 4201 1400 F +61 2 4201 1401 M +61 401 106 772 coffey.com

Red check 30/6/11

71935 A

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CILDISCL0005



LABORATORY REPORT COVERSHEET

Date: 8 July 2011

To: Coffey Geotechnics 118 Auburn St WOLLONGONG NSW 2500

Attention: Mr Edward Ibrahim

Your Reference:	ENAUWOLL04006AA	SE88475A
Laboratory Report No:	CE72868	
Samples Received:	6/07/2011	
Samples / Quantity:	7 Solls	

The above samples were received intact and analysed according to your written instructions. Unless otherwise stated, solid samples are reported on a dry weight basis and liquid samples as received.

Jon Dicker Manager CAIRNS

Anthony Nilsson Operations Manager CAIRNS



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Page 1 of 5



Laboratory Report No: CE72868

LABORATORY REPORT

 Our Reference Your Reference Type of Sample	Units	CE72868-1 SE88475A-3 Soil	CE72868-2 SE88475A-8 Soil	CE72868-3 SE88475A-9 Soil
Date Extracted		6/07/2011	6/07/2011	6/07/2011
Date Analysed		7/07/2001	7/07/2001	7/07/2001
Chromium Reducible Sulfur (ScR)	% w/w	0.034	0.012	0.008
a-Chromium Reducible Sulfur	mole H^+ / t	21	7.5	<5

 Our Reference Your Reference Type of Sample	Units	CE72868-4 SE88475A-10 Soil	CE72868-5 SE88475A-17 Soil	CE72868-6 SE88475A-20 Soil
Date Extracted		6/07/2011	6/07/2011	6/07/2011
Date Analysed		7/07/2001	7/07/2001	7/07/2001
Chromium Reducible Sulfur (ScR)	% w/w	0.015	<0.005	<0.005
a-Chromium Reducible Sulfur	mole H ⁺ / t	9.4	<5	<5

 Our Reference Your Reference Type of Sample	Units	CE72868-7 SE88475A-24 Soil
Date Extracted		6/07/2011
Date Analysed		7/07/2001
Chromium Reducible Sulfur (ScR)	% w/w	0.006
a-Chromium Reducible Sulfur	mole H ⁺ / t	<5



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Laboratory Report No: CE72868

LABORATORY REPORT

TEST PARAMETERS	UNITS	LOR	METHOD
Date Extracted			
Date Analysed			
Chromium Reducible Sulfur (ScR)	% w/w	0.005	AS4969.7
a-Chromium Reducible Sulfur	mole H ⁺ / t	5	AS4969.7



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Laboratory Report No: CE72868

QUALITY CONTROL	UNITS	Blank	Duplicate Sm#	Duplicate	Spike	CMS Recovery
				Sample Duplicate		
Data Extracted		-	0072060 1	6/07/2011 6/07/2011	Datah Spika	
Date Extracted		-	CE72000-1	8/07/2011 8/07/2011	вают эріке	-
Date Analysed		-	CE72868-1	7/07/2001 7/07/2001	Batch Spike	-
Chromium Reducible	% w/w	-	CE72868-1	0.034 0.042 RPD:	Batch Spike	105%
Sulfur (Scr)				21		
a-Chromium	mole H ⁺ / t	-	CE72868-1	21 26 RPD: 21	Batch Spike	-
Reducible Sulfur						

LABORATORY REPORT



Page 4 of 5



Laboratory Report No: CE72868

LABORATORY REPORT

NOTES:

LOR - Limit of Reporting.

The significance of all reported results are defined by their analytical limit of reporting.

Liming rate calculated using a Fineness factor of 1.5 (which is equivalent to finely divided Ag Lime <0.5mm) and Neutralising Value (NV) of 100% If using Liming Material <100% NV, then Liming Rate can be adusted as follows: Actual Liming Rate equals Calculated Liming Rate times 100 divided by NV of actual Liming Material Bulk Density of Material of 1g/cm3 assumed. If Bulk Density differs from 1g/cm3 then Liming rate can be adjusted as follows: Actual Liming Rate equals Calculated Liming Rate times Actual Bulk Density Geneva Legal Comment

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Analysis Date: Between 6/07/11 and 8/07/11

Disclaimer:

SGS and the authors have prepared this document in good faith,

consulting with Ahern CR, McElnea AE, Sullivan LA (2004)

Acid Sulphate Soils Laboratory Methods Guidelines,

Queensland Department of Natural Resources, Mines and Energy, Indooroopilly, Qld Aust.

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LABORATORY REPORT COVERSHEET

Date: 13 July 2011

- To: Coffey Geotechnics 118 Auburn St WOLLONGONG NSW 2500
- Attention: Chris Appelkamp

Your Reference:SE88475B - ENAUWOLL04006AA - Additional AnalysisLaboratory Report No:CE72868ASamples Received:6/07/2011Samples / Quantity:7 Soils

The above samples were received intact and analysed according to your written instructions. Unless otherwise stated, solid samples are reported on a dry weight basis and liquid samples as received.

Jon Dicker Manager CAIRNS

Anthony Nilsson Operations Manager CAIRNS



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SGS Australia Pty Ltd ABN 44 000 964 278

Environmental Services Unit 2, 58 Comport Street, Portsmith 4870 QLD Australia t +61 (0)7 4035 5111 f +61 (0)7 4035 5122

Page 1 of 7



LABORATORY REPORT

Chromium Suite - Acid Base				
Accounting				
Our Reference	Units	CE72868A-1	CE72868A-2	CE72868A-3
Your Reference		C1P09_0.5-0.7m	CIP12_1.0-1.2m	CIP12_1.5-1./M
		5011	5011	501
Date Extracted		6/07/2011	6/07/2011	6/07/2011
Date Analysed		7/07/2011	7/07/2011	7/07/2011
Moisture	% w/w	[NT]	[NT]	[NT]
рН ксі	pH Units	4.3	4.0	4.2
s-TAA pH 6.5	% w/w S	0.26	0.23	0.13
TAA pH 6.5	mole H ⁺ /t	160	150	81
Chromium Reducible Sulfur (ScR)	% w/w	0.034	0.012	0.008
a-Chromium Reducible Sulfur	mole H ⁺ / t	21	7.5	<5
Sнсі	% w/w	0.013	0.018	0.010
S ксі	% w/w	<0.005	0.008	0.017
S NAS	% w/w	0.013	0.0099	<0.005
Acid Neutralisation Capacity ANCBT	% CaCO3	NA	NA	NA
s-ANCbt	% w/w S	NA	NA	NA
а-АМСвт	mole H ⁺ / t	NA	NA	NA
s-Net Acidity	% w/w S	0.30	0.25	0.13
a-Net Acidity	mole H ⁺ /t	190	160	82
Liming Rate	kg CaCO3/tonne	14	12	6.2
Verification s-Net Acidity	% w/w S	0.03	NA	NA
a-Net Acidity without ANC	mole H ⁺ /t	190	160	82
Liming Rate without ANC	kg CaCO3/tonne	14	12	6.2



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LABORATORY REPORT

Chromium Suite - Acid Base Accounting Our Reference Your Reference Type of Sample	Units	CE72868A-4 CTP12_2.0-2.2m Soil	CE72868A-5 CTP14_1.5-1.7m Soil	CE72868A-6 CTP16_0.5-0.7m Soil
Date Extracted		6/07/2011	6/07/2011	6/07/2011
Date Analysed		7/07/2011	7/07/2011	7/07/2011
Moisture	% w/w	[NT]	[NT]	[NT]
рН ксі	pH Units	3.9	4.0	4.1
s-TAA pH 6.5	% w/w S	0.29	0.12	0.10
TAA pH 6.5	mole H ⁺ /t	180	74	62
Chromium Reducible Sulfur (ScR)	% w/w	0.015	<0.005	<0.005
a-Chromium Reducible Sulfur	mole H ⁺ / t	9.4	<5	<5
Sнсі	% w/w	0.028	0.086	0.011
S ксі	% w/w	0.016	0.074	<0.005
S NAS	% w/w	0.012	0.011	0.008
Acid Neutralisation Capacity ANCBT	% CaCO3	NA	NA	NA
s-ANСвт	% w/w S	NA	NA	NA
а-АМСвт	mole H ⁺ / t	NA	NA	NA
s-Net Acidity	% w/w S	0.32	0.13	0.11
a-Net Acidity	mole H ⁺ /t	200	81	68
Liming Rate	kg CaCO3/tonne	15	6.1	5.1
Verification s-Net Acidity	% w/w S	NA	NA	NA
a-Net Acidity without ANC	mole H ⁺ /t	200	81	68
Liming Rate without ANC	kg CaCO3/tonne	15	6.1	5.1



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Chromium Suite - Acid Base Accounting Our Reference Your Reference Type of Sample	Units	CE72868A-7 CTP17_0.5-0.7m Soil
Date Extracted		6/07/2011
Date Analysed		7/07/2011
Moisture	% w/w	[NT]
рН ксі	pH Units	4.6
s-TAA pH 6.5	% w/w S	0.11
TAA pH 6.5	mole H ⁺ /t	66
Chromium Reducible Sulfur (ScR)	% w/w	0.006
a-Chromium Reducible Sulfur	mole H ⁺ / t	<5
Sнсі	% w/w	NA
S ксі	% w/w	NA
S NAS	% w/w	NA
Acid Neutralisation Capacity ANCBT	% CaCO3	NA
s-ANСвт	% w/w S	NA
а-АМСвт	mole H ⁺ / t	NA
s-Net Acidity	% w/w S	0.11
a-Net Acidity	mole H ⁺ /t	70
Liming Rate	kg CaCO3/tonne	5.3
Verification s-Net Acidity	% w/w S	NA
a-Net Acidity without ANC	mole H ⁺ /t	70
Liming Rate without ANC	kg CaCO3/tonne	5.3

LABORATORY REPORT



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TEST PARAMETERS	UNITS	LOR	METHOD		
Chromium Suite - Acid Base Accounting					
Date Extracted					
Date Analysed					
Moisture	% w/w	0.1	AN002 RL2A1		
рН ксі	pH Units	0.1	AS4969.2 / AN219		
s-TAA pH 6.5	% w/w S	0.01	AS4969.2 / AN219		
TAA pH 6.5	mole H ⁺ /t	5	AS4969.2 / AN219		
Chromium Reducible Sulfur (ScR)	% w/w	0.005	AS4969.7		
a-Chromium Reducible Sulfur	mole H ⁺ / t	5	AS4969.7		
Shci	% w/w	0.005	AS4969.8 / AN014		
S ксі	% w/w	0.005	AS4969.4		
S NAS	% w/w	0.005	AS4969.11		
Acid Neutralisation Capacity ANCBT	% CaCO3	0.1	AN214		
S-ANCBT	% w/w S	0.01	AS4969.13 / AN214		
а-АМСвт	mole H ⁺ / t	5	AS4969.13 / AN214		
s-Net Acidity	% w/w S	0.01	Calculation		
a-Net Acidity	mole H ⁺ /t	5	Calculation		
Liming Rate	kg CaCO3/tonne	0.1	AS4969.14 / AN220		
Verification s-Net Acidity	% w/w S		Calculation		
a-Net Acidity without ANC	mole H ⁺ /t	5	Calculation		
Liming Rate without ANC	kg CaCO3/tonne	0.1	ASSMAC_23H		

LABORATORY REPORT



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QUALITY CONTROL	UNITS	Blank	Duplicate Sm#	Duplicate Sample Duplicate	Spike	CMS Recovery
Date Extracted		-	CE72868A-1	6/07/2011 6/07/2011	Batch Spike	-
Date Analysed		-	CE72868A-1	7/07/2011 7/07/2011	Batch Spike	-
Moisture	% w/w	-	[NT]	[NT]	Batch Spike	-
рН ксі	pH Units	5.8	CE72868A-1	4.3 4.3 RPD: 0	Batch Spike	-
s-TAA pH 6.5	% w/w S	-	CE72868A-1	0.26 0.25 RPD: 4	Batch Spike	-
TAA pH 6.5	mole H ⁺ /t	-	CE72868A-1	160 160 RPD: 0	Batch Spike	93%
Chromium Reducible Sulfur (ScR)	% w/w	-	CE72868A-1	0.034 0.042 RPD: 21	Batch Spike	105%
a-Chromium Reducible Sulfur	mole H ⁺ / t	-	CE72868A-1	21 26 RPD: 21	Batch Spike	-
Sнсі	% w/w	-	CE72868A-1	0.013 0.013 RPD: 0	Batch Spike	102%
S ксі	% w/w	-	CE72868A-1	<0.005 <0.005	Batch Spike	115%
S NAS	% w/w	-	CE72868A-1	0.013 0.011 RPD: 17	Batch Spike	-
Acid Neutralisation Capacity ANCBT	% CaCO3	-	CE72868A-1	NA NA	Batch Spike	-
S-ANCBT	% w/w S	-	CE72868A-1	NA NA	Batch Spike	-
а-АМСвт	mole H ⁺ / t	-	CE72868A-1	NA NA	Batch Spike	-
s-Net Acidity	% w/w S	-	CE72868A-1	0.30 0.30 RPD: 0	Batch Spike	-
a-Net Acidity	mole H ⁺ /t	-	CE72868A-1	190 190 RPD: 0	Batch Spike	-
Liming Rate	kg CaCO3/ton ne	-	CE72868A-1	14 14 RPD: 0	Batch Spike	-
Verification s-Net Acidity	% w/w S	-	CE72868A-1	0.03 0.04 RPD: 29	Batch Spike	-
a-Net Acidity without ANC	mole H ⁺ /t	-	CE72868A-1	190 190 RPD: 0	Batch Spike	-
Liming Rate without ANC	kg CaCO3/ton ne	-	CE72868A-1	14 14 RPD: 0	Batch Spike	-

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LABORATORY REPORT

NOTES:

LOR - Limit of Reporting. The significance of all reported results are defined by their analytical limit of reporting.

Liming rate calculated using a Fineness factor of 1.5 (which is equivalent to finely divided Ag Lime <0.5mm) and Neutralising Value (NV) of 100% If using Liming Material <100% NV, then Liming Rate can be adusted as follows: Actual Liming Rate equals Calculated Liming Rate times 100 divided by NV of actual Liming Material Bulk Density of Material of 1g/cm3 assumed. If Bulk Density differs from 1g/cm3 then Liming rate can be adjusted as follows: Actual Liming Rate equals Calculated Liming Rate times Actual Bulk Density Geneva Legal Comment

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Unless otherwise stated the results shown in this test report only refer to the sample(s) tested and such sample(s) are only retained for 60 days only. This document cannot be reproduced except in full, without prior approval of the Company.

Analysis Date: Between 11/07/11 and 13/07/11

Disclaimer:

SGS and the authors have prepared this document in good faith,

consulting with Ahern CR, McElnea AE, Sullivan LA (2004)

Acid Sulphate Soils Laboratory Methods Guidelines,

Queensland Department of Natural Resources, Mines and Energy, Indooroopilly, Qld Aust.

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SAMPLE RECEIPT ADVICE (SRA)

12 July 2011

Client Details Requested By Client Contact Address	:	Chris Appelkamp Coffey Environments Pty Ltd Manuel Fernandez 118 Auburn Street Wollongong NSW 2500		Laboratory De Laboratory Manager Address	etails : :	SGS Environmental Services Edward Ibrahim Unit 16, 33 Maddox Street Alexandria NSW 2015
Email Telephone Facsimile	: : :	manuel_fernandez@coffey.com 02 4201 1400 02 4201 1401		Email Telephone Facsimile	:	au.samplereceipt.sydney@sgs.com 61 2 8594 0400 61 2 8594 0499
Project Order Number Samples	:	ENAUWOLL04006AA-Chromium 28721-2 7 Soils	Suite-Additional Ana	alReport No No. of Samples Due Date	:	SE88475B 26 13/07/2011
Date Instructions Received Sample Receipt Date	:	11/07/2011 23/6/11				
Samples received in good orde Samples received without hear Upon receipt sample temperatu Sample containers provided by Turnaround time requested	er dspad ire :	: c:: : :	Samples received Sufficient quantity Cooling Method Samples clearly La Completed docume	in correct contain supplied belled entation received	ner:; : : :	

Samples will be held for 1 month for water samples and 3 months for soil samples from date of receipt of samples, unless otherwise instructed.

Comments

Full Chromium Suite:- Subcontracted to SGS Cairns

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The signed chain of custody will be returned to you with the original report.



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SAMPLE RECEIPT ADVICE (SRA) - continued

Client	:	Coffey Environments Pty Ltd	Report No	:	SE88475B
Project	:	ENAUWOLL04006AA-Chromium Suite-Additional Ar	alysis		

Summary of Samples and Requested Analysis

The table below represents SGS Environmental Service's understanding and interpretation of the customer supplied sample request.

Please indicate ASAP if your request differs from these details.

Testing shall commence immediately as per this table, unless the customer intervenes with a correction prior to testing. Note that a small X in the table below indicates some testing has not been requested in the package.

Sample No.	Description	No Prep Required	Chromium Suite - Acid Base Acc
3	CTP09	Х	Х
8	CTP12	Х	Х
9	CTP12	Х	Х
10	CTP12	Х	Х
17	CTP14	Х	Х
20	CTP16	Х	Х
24	CTP17	Х	Х

Sample No.	Description
3	CTP09
8	CTP12
9	CTP12
10	CTP12
17	CTP14
20	CTP16



SAMPLE RECEIPT ADVICE (SRA) - continued

Client	:	Coffey Environments Pty Ltd	Report No	:	SE88475B
Project	:	ENAUWOLL04006AA-ChromiumSuite-Add	litionalAnalysis		

Sample No.	Description
24	CTP17

SGS	CHAIN OF CUS (FC		DY & A	NAL B W(YS	IS R)	EQ	UES	бт		Receiving Initiating Send Re	g Laboratory: g Laboratory: Contact: sults to:-		SGS Sydney Angela Mamalia edward.lbrahin Iugia sanjoant(CAIROS y - Alexandria cos (au.samplereceipt.sydney@sgs.com) m@sgs.com and @sgs.com and
Final Report Required:	Yes / No / NATA	Prel	im Report	Due:	ŕ	3/7	am/	pm	Specia	al Pri	ces Apply:	th Hong C.	town	Yes/I	No
Send To:	Us) Client	Fina	al Report D)ue:		1 1	am/	pm	Quote	No:		2		Client	**
Address To:	Us / Client* (Address As Below)		Matrix		P	reser Met	vatio hod	n			Analysis I	Required			Remarks
SGS Job No: SE88475B	Client Job No: EN AJ WOLLOY OD 6 AA - Add thomal Anglysis	GL	i i				ы	U	He.						FULC
Sample No.	Sample No.	Wat	Soil		lce	Acio	Othe	Non	Chro	_					suite -
SC188475B-3	CTP09-0-5-07m 21/6/2011		×						×						1
- 8	CTP12-1-0-1-2m 216/201		×						×						(Rele penail)
- 9	CTP12-1:5-17M 2/6/201		×						×						attached.
-10	CTP12-2.0-2.7 21/6/201		×						X						
-17	CTP14_15-17 22/6/251		×						×						
-20	(7016 05-07n 22/6/2011		×						×						
-,24	CTP17- 0.5-0.7m 22/6/2011		*						×						Australian Air Express
															CONSIGNMENT No:
Relinquished By: Angela	a Mamalicos	Dat	e/Time:	ut	1/20	11				Red	ceived By:		-	Date/Time	
NOTES:* Clie	nt Address: Attention:Coffe	AJE AJE	ppelkamp nvironm burn st	neute veet	s (1)	44	8 . 0	x			*** Speci 	al Prices, Qu	otes	, Clients MI	UST BE Referred To.

AU.SampleReceipt.Sydney (Sydney)

From:	Crawford, Huong (Sydney)
Sent:	Monday, 11 July 2011 5:33 PM
To:	AU.SampleReceipt.Sydney (Sydney)
Cc:	chris_appelkamp@coffey.com
Subject	t: RE: Results for registration 'SE88475A - ENAUWOLL04006AA - Additional Analysis'

Hi Angale/Emily,

As per my discussion with Chris, please, re-book the above job in for full Chromium suite, Cairns has agreed to get the results out by COB 13/07/11.

Thanks.

Kind Regards,

Huong Crawford

Environmental Services Production Manager

 SGS Australia Pty Ltd

 Unit 16, 33 Maddox Street

 Alexandria NSW 2015

 Phone:
 +61 (0)2 8594 0403

 Fax:
 + 61 (0)2 8594 0499

 E-mail:
 Huong.Crawford@sgs.com

 Web:
 www.au.sgs.com

SGS DataNet: View Results Online

From: Chris Appelkamp [mailto:Chris_Appelkamp@coffey.com] Sent: Monday, 11 July 2011 2:11 PM To: Crawford, Huong (Sydney) Subject: RE: Results for registration 'SE88475A - ENAUWOLL04006AA - Additional Analysis'

Hi Huong,

I am wondering where the rest of the results from the Scr% suite are?

CHRIS APPELKAMP Project Engineering Geologist Coffey Geotechnics Wollongong Office 118 Auburn Street, Wollongong NSW 2500 Australia T (+61) (2) 42011400 F (+61) (2) 42011401 M 0410 221 767 coffey.com

From: Crawford, Huong (Sydney) [mailto:Huong.Crawford@sgs.com]
Sent: Monday, 11 July 2011 1:01 PM
To: Manuel Fernandez
Cc: Chris Appelkamp
Subject: Results for registration 'SE88475A - ENAUWOLL04006AA - Additional Analysis'

Hi Manuel & Chris,

Please, find attached the report for SE88475A.

Regards,

Huong

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ANALYTICAL REPORT

29 July 2011

Coffey Environments Pty Ltd

118 Auburn Street Wollongong **NSW 2500**

Attention: **Chris Appelkamp**

Your Reference: ENAUWOLL04006AA

Our Reference: SE89065

Samples: 20 Soils Received: 26/07/2011

Preliminary Report Sent: Not Issued

These samples were analysed in accordance with your written instructions.

For and on Behalf of: SGS ENVIRONMENTAL SERVICES

Sample Receipt: **Production Manager:** Angela Mamalicos Huong Crawford

AU.SampleReceipt.Sydney@sgs.com Huong.Crawford@sgs.com

Results Approved and/or Authorised by:

S. Caunel

Ravee Sivasubramaniam Asbestos Signatory

Ly Kim Ha

Organics Signatory Organics Signatory



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PROJECT: ENAUWOLL04006AA

UNITS	SE89065-1	SE20065 2			
UNITS	SE89065-1	SE00065 2			
		3E09000-2	SE89065-3	SE89065-4	SE89065-5
	SS01	QA12	SS02	SS03	QA11
	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m
	Soil	Soil	Soil	Soil	Soil
	25/07/2011	25/07/2011	25/07/2011	25/07/2011	25/07/2011
	27/07/2011	27/07/2011	27/07/2011	27/07/2011	27/07/2011
	27/07/2011	27/07/2011	27/07/2011	27/07/2011	27/07/2011
mg/kg	<20	<20	<20	<20	<20
	27/07/2011	27/07/2011	27/07/2011	27/07/2011	27/07/2011
	27/07/2011	27/07/2011	27/07/2011	27/07/2011	27/07/2011
mg/kg	<20	<20	<20	<20	<20
mg/kg	<50	<50	<50	<50	<50
mg/kg	<50	<50	<50	<50	<50
	mg/kg mg/kg mg/kg mg/kg	SS01 0.0m-0.1m Soil 25/07/2011 27/07/2011 27/07/2011 mg/kg <20 27/07/2011 27/07/2011 mg/kg <20 27/07/2011 mg/kg <20 mg/kg <50	SS01 QA12 0.0m-0.1m 0.0m-0.1m Soil Soil 25/07/2011 25/07/2011 27/07/2011 27/07/2011 27/07/2011 27/07/2011 mg/kg <20	SS01 QA12 SS02 0.0m-0.1m 0.0m-0.1m 0.0m-0.1m Soil Soil Soil 25/07/2011 25/07/2011 25/07/2011 27/07/2011 27/07/2011 27/07/2011 27/07/2011 27/07/2011 27/07/2011 mg/kg <20	SS01 QA12 SS02 SS03 0.0m-0.1m 0.0m-0.1m 0.0m-0.1m 0.0m-0.1m 0.0m-0.1m Soil Soil Soil Soil Soil Soil 25/07/2011 25/07/2011 25/07/2011 25/07/2011 25/07/2011 27/07/2011 27/07/2011 27/07/2011 27/07/2011 27/07/2011 mg/kg <20

TRH in soil with C6-C9 by P/T						
Our Reference:	UNITS	SE89065-6	SE89065-7	SE89065-8	SE89065-9	SE89065-1
						0
Your Reference		SS04	SS05	SS06	SS07	SS08
Depth		0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		25/07/2011	25/07/2011	25/07/2011	25/07/2011	25/07/2011
Date Extracted (TRH C6-C9 PT)		27/07/2011	27/07/2011	27/07/2011	27/07/2011	27/07/2011
Date Analysed (TRH C6-C9 PT)		27/07/2011	27/07/2011	27/07/2011	27/07/2011	27/07/2011
TRH C6 - C9 P&T	mg/kg	<20	<20	<20	<20	<20
Date Extracted (TRH C10-C36)		27/07/2011	27/07/2011	27/07/2011	27/07/2011	27/07/2011
Date Analysed (TRH C10-C36)		27/07/2011	27/07/2011	27/07/2011	27/07/2011	27/07/2011
TRH C10 - C14	mg/kg	<20	<20	<20	<20	<20
TRH C15 - C28	mg/kg	<50	<50	<50	<50	<50
TRH C29 - C36	mg/kg	<50	<50	<50	<50	<50



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PROJECT: ENAUWOLL04006AA

REPORT NO: SE89065

TRH in soil with C6-C9 by P/T						
Our Reference:	UNITS	SE89065-1	SE89065-1	SE89065-1	SE89065-1	SE89065-1
		1	2	3	4	5
Your Reference		SS09	SS10	SS11	SS12	SS13
Depth		0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		25/07/2011	25/07/2011	25/07/2011	25/07/2011	25/07/2011
Date Extracted (TRH C6-C9 PT)		27/07/2011	27/07/2011	27/07/2011	27/07/2011	27/07/2011
Date Analysed (TRH C6-C9 PT)		27/07/2011	27/07/2011	27/07/2011	27/07/2011	27/07/2011
TRH C6 - C9 P&T	mg/kg	<20	<20	<20	<20	<20
Date Extracted (TRH C10-C36)		27/07/2011	27/07/2011	27/07/2011	27/07/2011	27/07/2011
Date Analysed (TRH C10-C36)		27/07/2011	27/07/2011	27/07/2011	27/07/2011	27/07/2011
TRH C10 - C14	mg/kg	<20	<20	<20	<20	<20
TRH C15 - C28	mg/kg	<50	<50	<50	<50	<50
TRH C29 - C36	mg/kg	<50	<50	<50	<50	<50

TRH in soil with C6-C9 by P/T					
Our Reference:	UNITS	SE89065-1	SE89065-1	SE89065-1	SE89065-1
		6	7	8	9
Your Reference		SS14	SS15	SS16	SS17
Depth		0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m
Sample Matrix		Soil	Soil	Soil	Soil
Date Sampled		25/07/2011	25/07/2011	25/07/2011	25/07/2011
Date Extracted (TRH C6-C9 PT)		27/07/2011	27/07/2011	27/07/2011	27/07/2011
Date Analysed (TRH C6-C9 PT)		27/07/2011	27/07/2011	27/07/2011	27/07/2011
TRH C6 - C9 P&T	mg/kg	<20	<20	<20	<20
Date Extracted (TRH C10-C36)		27/07/2011	27/07/2011	27/07/2011	27/07/2011
Date Analysed (TRH C10-C36)		27/07/2011	27/07/2011	27/07/2011	27/07/2011
TRH C10 - C14	mg/kg	<20	<20	<20	<20
TRH C15 - C28	mg/kg	<50	<50	<50	<50
TRH C29 - C36	mg/kg	<50	<50	190	<50



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Environmental Services Unit 16/33 Maddox Street Alexandria NSW 2015 Australia t+61 (0)2 8594 0400 f+61 (0)2 8594 0499 www.au.sgs.com SGS Australia Pty Ltd ABN 44 000 964 278
PAHs in Soil						
Our Reference:	UNITS	SE89065-1	SE89065-2	SE89065-3	SE89065-4	SE89065-5
Your Reference		SS01	QA12	SS02	SS03	QA11
Depth		0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		25/07/2011	25/07/2011	25/07/2011	25/07/2011	25/07/2011
Date Extracted		27/07/2011	27/07/2011	27/07/2011	27/07/2011	27/07/2011
Date Analysed		27/07/2011	27/07/2011	27/07/2011	27/07/2011	27/07/2011
Naphthalene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthylene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Fluorene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Phenanthrene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Anthracene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Fluoranthene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Pyrene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo[a]anthracene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Chrysene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo[b]fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo[k]fluoranthene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo[a]pyrene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Indeno[123-cd]pyrene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Dibenzo[ah]anthracene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo[ghi]perylene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Total PAHs (sum)	mg/kg	<2	<2	<2	<2	<2
Nitrobenzene-d5	%	92	92	90	90	88
2-Fluorobiphenyl	%	76	80	76	78	76
p -Terphenyl-d14	%	84	80	82	84	82



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REPORT NO: SE89065

PAHs in Soil						
Our Reference:	UNITS	SE89065-6	SE89065-7	SE89065-8	SE89065-9	SE89065-1
						0
Your Reference		SS04	SS05	SS06	SS07	SS08
Depth		0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		25/07/2011	25/07/2011	25/07/2011	25/07/2011	25/07/2011
Date Extracted		27/07/2011	27/07/2011	27/07/2011	27/07/2011	27/07/2011
Date Analysed		27/07/2011	27/07/2011	27/07/2011	27/07/2011	27/07/2011
Naphthalene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthylene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Fluorene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Phenanthrene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Anthracene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Fluoranthene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Pyrene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo[a]anthracene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Chrysene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo[b]fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo[k]fluoranthene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo[a]pyrene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Indeno[123-cd]pyrene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Dibenzo[ah]anthracene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo[ghi]perylene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Total PAHs (sum)	mg/kg	<2	<2	<2	<2	<2
Nitrobenzene-d5	%	96	90	86	90	90
2-Fluorobiphenyl	%	84	78	74	74	76
<i>p</i> -Terphenyl- <i>d14</i>	%	84	84	78	78	78



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SGS Australia Pty Ltd ABN 44 000 964 278

REPORT NO: SE89065

PAHs in Soil						
Our Reference:	UNITS	SE89065-1	SE89065-1	SE89065-1	SE89065-1	SE89065-1
		1	2	3	4	5
Your Reference		SS09	SS10	SS11	SS12	SS13
Depth		0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		25/07/2011	25/07/2011	25/07/2011	25/07/2011	25/07/2011
Date Extracted		27/07/2011	27/07/2011	27/07/2011	27/07/2011	27/07/2011
Date Analysed		27/07/2011	27/07/2011	27/07/2011	27/07/2011	27/07/2011
Naphthalene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthylene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Fluorene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Phenanthrene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Anthracene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Fluoranthene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Pyrene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo[a]anthracene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Chrysene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo[b]fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo[k]fluoranthene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo[a]pyrene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Indeno[123-cd]pyrene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Dibenzo[ah]anthracene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo[ghi]perylene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Total PAHs (sum)	mg/kg	<2	<2	<2	<2	<2
Nitrobenzene-d5	%	94	88	88	86	80
2-Fluorobiphenyl	%	78	76	76	74	74
p -Terphenyl-d14	%	74	78	74	76	76



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PAHs in Soil					
Our Reference:	UNITS	SE89065-1	SE89065-1	SE89065-1	SE89065-1
		6	7	8	9
Your Reference		SS14	SS15	SS16	SS17
Depth		0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m
Sample Matrix		Soil	Soil	Soil	Soil
Date Sampled		25/07/2011	25/07/2011	25/07/2011	25/07/2011
Date Extracted		27/07/2011	27/07/2011	27/07/2011	27/07/2011
Date Analysed		27/07/2011	27/07/2011	27/07/2011	27/07/2011
Naphthalene	mg/kg	<0.10	<0.10	<0.10	<0.10
Acenaphthylene	mg/kg	<0.10	<0.10	<0.10	<0.10
Acenaphthene	mg/kg	<0.10	<0.10	<0.10	<0.10
Fluorene	mg/kg	<0.10	<0.10	<0.10	<0.10
Phenanthrene	mg/kg	<0.10	<0.10	<0.10	<0.10
Anthracene	mg/kg	<0.10	<0.10	<0.10	<0.10
Fluoranthene	mg/kg	<0.10	<0.10	<0.10	<0.10
Pyrene	mg/kg	<0.10	<0.10	<0.10	<0.10
Benzo[a]anthracene	mg/kg	<0.10	<0.10	<0.10	<0.10
Chrysene	mg/kg	<0.10	<0.10	<0.10	<0.10
Benzo[b]fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo[k]fluoranthene	mg/kg	<0.10	<0.10	<0.10	<0.10
Benzo[a]pyrene	mg/kg	<0.10	<0.10	<0.10	<0.10
Indeno[123-cd]pyrene	mg/kg	<0.10	<0.10	<0.10	<0.10
Dibenzo[ah]anthracene	mg/kg	<0.10	<0.10	<0.10	<0.10
Benzo[ghi]perylene	mg/kg	<0.10	<0.10	<0.10	<0.10
Total PAHs (sum)	mg/kg	<2	<2	<2	<2
Nitrobenzene-d5	%	82	84	84	82
2-Fluorobiphenyl	%	78	76	78	74
p -Terphenyl-d14	%	80	78	86	82



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OP Pesticides in Soil by GCMS						
Our Reference:	UNITS	SE89065-1	SE89065-2	SE89065-3	SE89065-4	SE89065-5
Your Reference		SS01	QA12	SS02	SS03	QA11
Depth		0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		25/07/2011	25/07/2011	25/07/2011	25/07/2011	25/07/2011
Date Extracted		27/07/2011	27/07/2011	27/07/2011	27/07/2011	27/07/2011
Date Analysed		27/07/2011	27/07/2011	27/07/2011	27/07/2011	27/07/2011
Dichlorvos	mg/kg	<1	<1	<1	<1	<1
Dimethoate	mg/kg	<1	<1	<1	<1	<1
Diazinon	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20
Chlorpyrifos-ethyl	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Bromofos-ethyl	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20
2-fluorobiphenyl (Surr)	%	76	80	76	78	76
d14-p-Terphenyl (Surr)	%	84	80	82	84	82

OP Pesticides in Soil by GCMS						
Our Reference:	UNITS	SE89065-6	SE89065-7	SE89065-8	SE89065-9	SE89065-1 0
Your Reference		SS04	SS05	SS06	SS07	SS08
Depth		0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		25/07/2011	25/07/2011	25/07/2011	25/07/2011	25/07/2011
Date Extracted		27/07/2011	27/07/2011	27/07/2011	27/07/2011	27/07/2011
Date Analysed		27/07/2011	27/07/2011	27/07/2011	27/07/2011	27/07/2011
Dichlorvos	mg/kg	<1	<1	<1	<1	<1
Dimethoate	mg/kg	<1	<1	<1	<1	<1
Diazinon	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20
Chlorpyrifos-ethyl	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Bromofos-ethyl	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20
2-fluorobiphenyl (Surr)	%	84	78	74	74	76
d14-p-Terphenyl (Surr)	%	84	84	78	78	78



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REPORT NO: SE89065

OP Pesticides in Soil by GCMS						
Our Reference:	UNITS	SE89065-1	SE89065-1	SE89065-1	SE89065-1	SE89065-1
		1	2	3	4	5
Your Reference		SS09	SS10	SS11	SS12	SS13
Depth		0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		25/07/2011	25/07/2011	25/07/2011	25/07/2011	25/07/2011
Date Extracted		27/07/2011	27/07/2011	27/07/2011	27/07/2011	27/07/2011
Date Analysed		27/07/2011	27/07/2011	27/07/2011	27/07/2011	27/07/2011
Dichlorvos	mg/kg	<1	<1	<1	<1	<1
Dimethoate	mg/kg	<1	<1	<1	<1	<1
Diazinon	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20
Chlorpyrifos-ethyl	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Bromofos-ethyl	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20
2-fluorobiphenyl (Surr)	%	78	76	76	74	74
d14-p-Terphenyl (Surr)	%	74	78	74	76	76



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UNITS	SE89065-1	SE89065-1	SE89065-1	SE89065-1
	6	7	8	9
	SS14	SS15	SS16	SS17
	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m
	Soil	Soil	Soil	Soil
	25/07/2011	25/07/2011	25/07/2011	25/07/2011
	27/07/2011	27/07/2011	27/07/2011	27/07/2011
	27/07/2011	27/07/2011	27/07/2011	27/07/2011
mg/kg	<1	<1	<1	<1
mg/kg	<1	<1	<1	<1
mg/kg	<0.5	<0.5	<0.5	<0.5
mg/kg	<0.2	<0.2	<0.2	<0.2
mg/kg	<0.20	<0.20	<0.20	<0.20
mg/kg	<0.2	<0.2	<0.2	<0.2
mg/kg	<0.2	<0.2	<0.2	<0.2
mg/kg	<0.2	<0.2	<0.2	<0.2
mg/kg	<0.5	<0.5	<0.5	<0.5
mg/kg	<0.2	<0.2	<0.2	<0.2
mg/kg	<0.20	<0.20	<0.20	<0.20
%	78	76	78	74
%	80	78	86	82
	UNITS	UNITS SE89065-1 6	UNITS SE89065-1 6 SE89065-1 7	UNITSSE89065-1 6SE89065-1 7SE89065-1 8SS14SS15SS160.0m-0.1m0.0m-0.1m0.0m-0.1mSoil25/07/201127/07/201127/07/201127/07/201127/07/201127/07/201127/07/201127/07/2011mg/kg<1



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Asbestos ID in soil						
Our Reference:	UNITS	SE89065-2	SE89065-2	SE89065-2	SE89065-2	SE89065-2
		0	1	2	3	4
Your Reference		SS30	SS31	SS32	SS33	SS34
Depth		0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		25/07/2011	25/07/2011	25/07/2011	25/07/2011	25/07/2011
Date Analysed		28/07/2011	28/07/2011	28/07/2011	28/07/2011	28/07/2011
Sample Description		70g	98g	70g	68g	55g
		Soil,rocks	Soil,rocks	Soil,rocks	Soil,rocks	Soil,rocks
Asbestos ID in soil	-	No	No	No	No	No
		asbestos	asbestos	asbestos	asbestos	asbestos
		detected	detected	detected	detected	detected
		Organic	Organic	Organic	Organic	Organic
		fibres	fibres	fibres	fibres	fibres
		detected	detected	detected	detected	detected

Asbestos ID in soil						
Our Reference:	UNITS	SE89065-2	SE89065-2	SE89065-2	SE89065-2	SE89065-2
		5	6	7	8	9
Your Reference		SS35	SS36	SS37	SS38	SS39
Depth		0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		25/07/2011	25/07/2011	25/07/2011	25/07/2011	25/07/2011
Date Analysed		28/07/2011	28/07/2011	28/07/2011	28/07/2011	28/07/2011
Sample Description		54g	70g	58g	78g	63g
		Soil,rocks	Soil,rocks	Soil,rocks	Soil,rocks	Soil,rocks
Asbestos ID in soil	-	No	No	No	No	No
		asbestos	asbestos	asbestos	asbestos	asbestos
		detected	detected	detected	detected	detected
		Organic	Organic	Organic	Organic	Organic
		fibres	fibres	fibres	fibres	fibres
		detected	detected	detected	detected	detected



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Moisture						
Our Reference:	UNITS	SE89065-1	SE89065-2	SE89065-3	SE89065-4	SE89065-5
Your Reference		SS01	QA12	SS02	SS03	QA11
Depth		0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		25/07/2011	25/07/2011	25/07/2011	25/07/2011	25/07/2011
Date Analysed (moisture)		27/07/2011	27/07/2011	27/07/2011	27/07/2011	27/07/2011
Moisture	%	7	11	9	17	18

Moisture Our Reference:	UNITS	SE89065-6	SE89065-7	SE89065-8	SE89065-9	SE89065-1 0
Your Reference		SS04	SS05	SS06	SS07	SS08
Depth		0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m
Sample Matrix Date Sampled		Soil 25/07/2011	Soil 25/07/2011	Soil 25/07/2011	Soil 25/07/2011	Soil 25/07/2011
Date Analysed (moisture)		27/07/2011	27/07/2011	27/07/2011	27/07/2011	27/07/2011
Moisture	%	22	12	30	31	51

Moisture						
Our Reference:	UNITS	SE89065-1	SE89065-1	SE89065-1	SE89065-1	SE89065-1
		1	2	3	4	5
Your Reference		SS09	SS10	SS11	SS12	SS13
Depth		0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		25/07/2011	25/07/2011	25/07/2011	25/07/2011	25/07/2011
Date Analysed (moisture)		27/07/2011	27/07/2011	27/07/2011	27/07/2011	27/07/2011
Moisture	%	48	28	25	28	44

Moisture					
Our Reference:	UNITS	SE89065-1	SE89065-1	SE89065-1	SE89065-1
		6	7	8	9
Your Reference		SS14	SS15	SS16	SS17
Depth		0.0m-0.1m	0.0m-0.1m	0.0m-0.1m	0.0m-0.1m
Sample Matrix		Soil	Soil	Soil	Soil
Date Sampled		25/07/2011	25/07/2011	25/07/2011	25/07/2011
Date Analysed (moisture)		27/07/2011	27/07/2011	27/07/2011	27/07/2011
Moisture	%	37	42	72	47



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Method ID	Methodology Summary
AN410	BTEX / C6-C9 Hydrocarbons - Soil samples are extracted with methanol, purged and concentrated by a purge and trap apparatus, and then analysed using GC/MS technique. Water samples undergo the same analysis without the extraction step. Based on USEPA 5030B and 8260B.
AN403	Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36, in accordance with the Australian Institute of Petroleum (AIP). Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Petroleum Hydrocarbons (TPH) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the elluent solvents. The GC/FID method is not well suited to the analysis of refined high boiling point materials (i.e. lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol (if care to control volatility is taken). This method will detect naturally occurring hydrocarbons, lipids, organic acids, phenols and PAHs if they are present at sufficient levels, dependant on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN422	Polynuclear Aromatic Hydrocarbons - determined by solvent extraction with dichloromethane / acetone for soils and dichloromethane for waters, followed by instrumentation analysis using GC/MS SIM mode. Based on USEPA 8270 and 8310.
AN420	Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates, and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD/FID technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN602	Analysed using in house method AN602 - Qualitative identification of Asbestos Fibres, Synthetic Mineral Fibres and Organic Fibres in bulk samples (including building materials and soils) using Polarised Light Microscopy and Dispersion Staining Techniques. This method complies with AS4964-2004: Method for the Qualitative Identification of Asbestos in Bulk Samples.
AN002	



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REPORT NO: SE89065

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
TRH in soil with C6-C9 by P/T						Base + Duplicate + %RPD		Duplicate + %RPD
Date Extracted (TRH C6-C9 PT)				27/7/20 11	SE89065-5	27/07/2011 27/07/2011	SE89065-1 6	27/7/2011
Date Analysed (TRH C6-C9 PT)				27/7/20 11	SE89065-5	27/07/2011 27/07/2011	SE89065-1 6	27/7/2011
TRH C6 - C9 P&T	mg/kg	20	AN410	<20	SE89065-5	<20 <20	SE89065-1 6	103%
Date Extracted (TRH C10-C36)				27/07/2 011	SE89065-5	27/07/2011 27/07/2011	[NR]	[NR]
Date Analysed (TRH C10-C36)				27/07/2 011	SE89065-5	27/07/2011 27/07/2011	[NR]	[NR]
TRH C10 - C14	mg/kg	20	AN403	<20	SE89065-5	<20 [N/T]	[NR]	[NR]
TRH C15 - C28	mg/kg	50	AN403	<50	SE89065-5	<50 [N/T]	[NR]	[NR]
TRH C29 - C36	mg/kg	50	AN403	<50	SE89065-5	<50 [N/T]	[NR]	[NR]

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
PAHs in Soil						Base + Duplicate + %RPD		Duplicate + %RPD
Date Extracted				27/7/20 11	SE89065-1	27/07/2011 27/07/2011	SE89065-3	27/7/2011
Date Analysed				27/7/20 11	SE89065-1	27/07/2011 27/07/2011	SE89065-3	27/7/2011
Naphthalene	mg/kg	0.1	AN422	<0.10	SE89065-1	<0.10 <0.10	SE89065-3	78%
Acenaphthylene	mg/kg	0.1	AN422	<0.10	SE89065-1	<0.10 <0.10	SE89065-3	89%
Acenaphthene	mg/kg	0.1	AN422	<0.10	SE89065-1	<0.10 <0.10	SE89065-3	74%
Fluorene	mg/kg	0.1	AN422	<0.10	SE89065-1	<0.10 <0.10	[NR]	[NR]
Phenanthrene	mg/kg	0.1	AN422	<0.10	SE89065-1	<0.10 <0.10	SE89065-3	73%
Anthracene	mg/kg	0.1	AN422	<0.10	SE89065-1	<0.10 <0.10	SE89065-3	103%
Fluoranthene	mg/kg	0.1	AN422	<0.10	SE89065-1	<0.10 <0.10	SE89065-3	84%
Pyrene	mg/kg	0.1	AN422	<0.10	SE89065-1	<0.10 <0.10	SE89065-3	87%
Benzo[a]anthracene	mg/kg	0.1	AN422	<0.10	SE89065-1	<0.10 <0.10	[NR]	[NR]
Chrysene	mg/kg	0.1	AN422	<0.10	SE89065-1	<0.10 <0.10	[NR]	[NR]
Benzo[b]fluoranthene	mg/kg	0.1	AN422	<0.1	SE89065-1	<0.1 <0.1	[NR]	[NR]
Benzo[k]fluoranthene	mg/kg	0.1	AN422	<0.10	SE89065-1	<0.10 <0.10	[NR]	[NR]
Benzo[a]pyrene	mg/kg	0.1	AN422	<0.10	SE89065-1	<0.10 <0.10	SE89065-3	82%
Indeno[<i>123-cd</i>]pyren e	mg/kg	0.1	AN422	<0.10	SE89065-1	<0.10 <0.10	[NR]	[NR]
Dibenzo[<i>ah</i>]anthrace ne	mg/kg	0.1	AN422	<0.10	SE89065-1	<0.10 <0.10	[NR]	[NR]
Benzo[ghi]perylene	mg/kg	0.1	AN422	<0.10	SE89065-1	<0.10 <0.10	[NR]	[NR]
Total PAHs (sum)	mg/kg	1.6	AN422	<2	SE89065-1	<2 <2	[NR]	[NR]
Nitrobenzene-d5	%	0	AN422	98	SE89065-1	92 90 RPD: 2	SE89065-3	92%



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REPORT NO: SE89065

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
PAHs in Soil						Base + Duplicate + %RPD		Duplicate + %RPD
2-Fluorobiphenyl	%	0	AN422	82	SE89065-1	76 80 RPD: 5	SE89065-3	84%
p -Terphenyl-d 14	%	0	AN422	86	SE89065-1	84 78 RPD: 7	SE89065-3	106%

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
OP Pesticides in Soil by GCMS						Base + Duplicate + %RPD		Duplicate + %RPD
Date Extracted				27/7/20 11	SE89065-1	27/07/2011 27/07/2011	SE89065-4	27/7/2011
Date Analysed				27/7/20 11	SE89065-1	27/07/2011 27/07/2011	SE89065-4	27/7/2011
Dichlorvos	mg/kg	1	AN420	<1	SE89065-1	<1 <1	SE89065-4	79%
Dimethoate	mg/kg	1	AN420	<1	SE89065-1	<1 <1	[NR]	[NR]
Diazinon	mg/kg	0.5	AN420	<0.5	SE89065-1	<0.5 <0.5	SE89065-4	78%
Fenitrothion	mg/kg	0.2	AN420	<0.2	SE89065-1	<0.2 <0.2	[NR]	[NR]
Malathion	mg/kg	0.2	AN420	<0.20	SE89065-1	<0.20 <0.20	[NR]	[NR]
Chlorpyrifos-ethyl	mg/kg	0.2	AN420	<0.2	SE89065-1	<0.2 <0.2	SE89065-4	101%
Parathion-ethyl	mg/kg	0.2	AN420	<0.2	SE89065-1	<0.2 <0.2	[NR]	[NR]
Bromofos-ethyl	mg/kg	0.2	AN420	<0.2	SE89065-1	<0.2 <0.2	[NR]	[NR]
Methidathion	mg/kg	0.5	AN420	<0.5	SE89065-1	<0.5 <0.5	[NR]	[NR]
Ethion	mg/kg	0.2	AN420	<0.2	SE89065-1	<0.2 <0.2	SE89065-4	103%
Azinphos-methyl	mg/kg	0.2	AN420	<0.20	SE89065-1	<0.20 <0.20	[NR]	[NR]
2-fluorobiphenyl (Surr)	%	0	AN420	82	SE89065-1	76 80 RPD: 5	SE89065-4	78%
d14-p-Terphenyl (Surr)	%	0	AN420	86	SE89065-1	84 78 RPD: 7	SE89065-4	84%



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QUALITY CONTROL	UNITS	LOR	METHOD	Blank
Asbestos ID in soil				
Date Analysed				[NT]

QUALITY CONTROL	UNITS	LOR	METHOD	Blank
Moisture				
Date Analysed (moisture)				[NT]
Moisture	%	1	AN002	[NT]

QUALITY CONTROL	UNITS	Dup. Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
TRH in soil with C6-C9 by P/T			Base + Duplicate + %RPD		Duplicate + %RPD
Date Extracted (TRH C6-C9 PT)		SE89065-1 5	27/07/2011 27/07/2011	[NR]	[NR]
Date Analysed (TRH C6-C9 PT)		SE89065-1 5	27/07/2011 27/07/2011	[NR]	[NR]
TRH C6 - C9 P&T	mg/kg	SE89065-1 5	<20 <20	[NR]	[NR]
Date Extracted (TRH C10-C36)		SE89065-1 5	27/07/2011 27/07/2011	SE89065-2	27/07/2011
Date Analysed (TRH C10-C36)		SE89065-1 5	27/07/2011 27/07/2011	SE89065-2	27/07/2011
TRH C10 - C14	mg/kg	SE89065-1 5	<20 [N/T]	SE89065-2	94%
TRH C15 - C28	mg/kg	SE89065-1 5	<50 [N/T]	SE89065-2	100%
TRH C29 - C36	mg/kg	SE89065-1 5	<50 [N/T]	SE89065-2	108%



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QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date Extracted		SE89065-1 1	27/07/2011 27/07/2011
Date Analysed		SE89065-1 1	27/07/2011 27/07/2011
Naphthalene	mg/kg	SE89065-1 1	<0.10 <0.10
Acenaphthylene	mg/kg	SE89065-1 1	<0.10 <0.10
Acenaphthene	mg/kg	SE89065-1 1	<0.10 <0.10
Fluorene	mg/kg	SE89065-1 1	<0.10 <0.10
Phenanthrene	mg/kg	SE89065-1 1	<0.10 <0.10
Anthracene	mg/kg	SE89065-1 1	<0.10 <0.10
Fluoranthene	mg/kg	SE89065-1 1	<0.10 <0.10
Pyrene	mg/kg	SE89065-1 1	<0.10 <0.10
Benzo[a]anthracene	mg/kg	SE89065-1 1	<0.10 <0.10
Chrysene	mg/kg	SE89065-1 1	<0.10 <0.10
Benzo[b]fluoranthene	mg/kg	SE89065-1 1	<0.1 <0.1
Benzo[k]fluoranthene	mg/kg	SE89065-1 1	<0.10 <0.10
Benzo[a]pyrene	mg/kg	SE89065-1 1	<0.10 <0.10
Indeno[123-cd]pyrene	mg/kg	SE89065-1 1	<0.10 <0.10
Dibenzo[<i>ah</i>]anthracene	mg/kg	SE89065-1 1	<0.10 <0.10
Benzo[ghi]perylene	mg/kg	SE89065-1 1	<0.10 <0.10
Total PAHs (sum)	mg/kg	SE89065-1 1	<2 <2
Nitrobenzene-d5	%	SE89065-1 1	94 92 RPD: 2
2-Fluorobiphenyl	%	SE89065-1 1	78 78 RPD: 0
p -Terphenyl-d14	%	SE89065-1 1	74 76 RPD: 3



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QUALITY CONTROL	UNITS	Dup. Sm#	Duplicate
OP Pesticides in Soil by GCMS			Base + Duplicate + %RPD
Date Extracted		SE89065-1 1	27/07/2011 27/07/2011
Date Analysed		SE89065-1 1	27/07/2011 27/07/2011
Dichlorvos	mg/kg	SE89065-1 1	<1 <1
Dimethoate	mg/kg	SE89065-1 1	<1 <1
Diazinon	mg/kg	SE89065-1 1	<0.5 <0.5
Fenitrothion	mg/kg	SE89065-1 1	<0.2 <0.2
Malathion	mg/kg	SE89065-1 1	<0.20 <0.20
Chlorpyrifos-ethyl	mg/kg	SE89065-1 1	<0.2 <0.2
Parathion-ethyl	mg/kg	SE89065-1 1	<0.2 <0.2
Bromofos-ethyl	mg/kg	SE89065-1 1	<0.2 <0.2
Methidathion	mg/kg	SE89065-1 1	<0.5 <0.5
Ethion	mg/kg	SE89065-1 1	<0.2 <0.2
Azinphos-methyl	mg/kg	SE89065-1 1	<0.20 <0.20
2-fluorobiphenyl (Surr)	%	SE89065-1 1	78 78 RPD: 0
d14-p-Terphenyl (Surr)	%	SE89065-1 1	74 76 RPD: 3



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REPORT NO: S	E89065
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QUALITY CONTROL	UNITS	Dup. Sm#	Duplicate
TRH in soil with C6-C9 by P/T			Base + Duplicate + %RPD
Date Extracted (TRH C6-C9 PT)		SE89065-1	27/07/2011 27/07/2011
Date Analysed (TRH C6-C9 PT)		SE89065-1	27/07/2011 27/07/2011
TRH C6 - C9 P&T	mg/kg	SE89065-1	<20 [N/T]
Date Extracted (TRH C10-C36)		SE89065-1	27/07/2011 27/07/2011
Date Analysed (TRH C10-C36)		SE89065-1	27/07/2011 27/07/2011
TRH C10 - C14	mg/kg	SE89065-1	<20 <20
TRH C15 - C28	mg/kg	SE89065-1	<50 <50
TRH C29 - C36	mg/kg	SE89065-1	<50 <50

QUALITY CONTROL TRH in soil with C6-C9 by P/T	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date Extracted (TRH C6-C9 PT)		SE89065-1 1	27/07/2011 27/07/2011
Date Analysed (TRH C6-C9 PT)		SE89065-1 1	27/07/2011 27/07/2011
TRH C6 - C9 P&T	mg/kg	SE89065-1 1	<20 [N/T]
Date Extracted (TRH C10-C36)		SE89065-1 1	27/07/2011 27/07/2011
Date Analysed (TRH C10-C36)		SE89065-1 1	27/07/2011 27/07/2011
TRH C10 - C14	mg/kg	SE89065-1 1	<20 <20
TRH C15 - C28	mg/kg	SE89065-1 1	<50 <50
TRH C29 - C36	mg/kg	SE89065-1 1	<50 <50



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Result Codes

Sampled by the client

[INS] Insufficient Sample for this test : [NR] Not Requested [NT] Not tested : [LOR] : Limit of reporting **Report Comments**

[RPD] : Relative Percentage Difference : Not part of NATA Accreditation

[N/A] : Not Applicable

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

No respirable fibres detected using trace analysis technique.

No Asbestos Fibres Detected at the LOR of 0.01% w/w.

Asbestos analysed by Approved Identifier Yusuf Kuthpudin. Samples analysed as received. Solid samples expressed on a dry weight basis. Date Organics extraction commenced:

NATA Corporate Accreditation No. 2562, Site No 4354

Note: Test results are not corrected for recovery (excluding Air-toxics and Dioxins/Furans*) This document is issued by the Company subject to its General Conditions of Service (www.sgs.com/terms and conditions.htm). Attention is drawn to the limitations of liability, indemnification and jurisdictional issues established therein.

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Quality Control Protocol

Method Blank: An analyte free matrix to which all reagents are added in the same volume or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. A method blank is prepared every 20 samples.

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

Surrogate Spike: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. Surrogates are added to samples before extraction to monitor extraction efficiency and percent recovery in each sample.

Internal Standard: Added to all samples requiring analysis for organics (where relevant) or metals by ICP after the extraction/digestion process; the compounds/elements serve to give a standard of retention time and/or response, which is invariant from run-to-run with the instruments

Laboratory Control Sample: A known matrix spiked with compound(s) representative of the target analytes. It is used to document laboratory performance. When the results of the matrix spike analysis indicates a potential problem due to the sample matrix itself, the LCS results are used to verify that the laboratory can perform the analysis in a clean matrix.

Matrix Spike: An aliquot of sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.



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Quality Acceptance Criteria

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: http://www.au.sgs.com/sgs-mp-au-env-qu-022-qa-qc-plan-en-09.pdf



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Page 21 of 21

SGS Australia Pty Ltd ABN 44 000 964 278

Environmental Services Unit 16/33 Maddox Street Alexandria NSW 2015 Australia t +61 (0)2 8594 0400 f + 61 (0)2 8594 0499

www.au.sgs.com



SAMPLE RECEIPT ADVICE (SRA)

26 July 2011

Client Details Requested By Client Contact Address	:	Chris Appelkamp Coffey Environments Pty Ltd Chris Appelkamp 118 Auburn Street Wollongong NSW 2500	Laboratory D Laboratory Manager Address	etails : :	SGS Environmental Services Edward Ibrahim Unit 16, 33 Maddox Street Alexandria NSW 2015
Email Telephone Facsimile	: : :	chris_appelkamp@coffey.com 02 4201 1400 02 4201 1401	Email Telephone Facsimile	:	au.samplereceipt.sydney@sgs.com 61 2 8594 0400 61 2 8594 0499
Project Order Number Samples	:	ENAUWOLL04006AA 28723-28724 20 Soils	Report No No. of Samples Due Date	: 3 : :	SE89065 29 29/07/2011
Date Instructions Received Sample Receipt Date	:	26/07/2011 26/07/2011			
Samples received in good orde Samples received without hea Upon receipt sample temperatu Sample containers provided by Turnaround time requested	er dspac ure : /	: YES YES Cool : Other Lab : 3 Days	Samples received in correct conta Sufficient quantity supplied Cooling Method Samples clearly Labelled Completed documentation received	iner:; : : :	YES YES Ice YES YES

Samples will be held for 1 month for water samples and 3 months for soil samples from date of receipt of samples, unless otherwise instructed.

Comments

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

The signed chain of custody will be returned to you with the original report.



Ble Australio III V 100 | Unit 16, 33 Maddox Street Alexandria New South Wales 2015 t+61 (0)2 8594 0400 f+61 (0)2 85940499 www.au.sgs.com



SAMPLE RECEIPT ADVICE (SRA) - continued

Client	:	Coffey Environments Pty Ltd	Report No	:	SE89065
Project	:	ENAUWOLL04006AA			

Summary of Samples and Requested Analysis

The table below represents SGS Environmental Service's understanding and interpretation of the customer supplied sample request.

Please indicate ASAP if your request differs from these details.

Testing shall commence immediately as per this table, unless the customer intervenes with a correction prior to testing. Note that a small X in the table below indicates some testing has not been requested in the package.

Sample No.	Description	No Prep Required	TRH in soil with C6-C9 by P/T	PAHs in Soil	OP Pesticides in Soil by GCMS	Asbestos ID in soil	Moisture
1	SS01	X	X	X	X		Х
2	QA12	Х	Х	Х	Х		Х
3	SS02	Х	Х	Х	Х		Х
4	SS03	Х	Х	Х	Х		Х
5	QA11	Х	Х	Х	Х		Х
6	SS04	Х	Х	Х	Х		Х
7	SS05	Х	Х	Х	Х		Х
8	SS06	Х	Х	х	Х		Х
9	SS07	Х	Х	Х	Х		Х
10	SS08	Х	Х	Х	Х		Х
11	SS09	Х	Х	Х	Х		Х
12	SS10	Х	Х	Х	Х		Х
13	SS11	Х	Х	х	Х		Х
14	SS12	Х	Х	Х	Х		Х
15	SS13	Х	Х	Х	Х		Х
16	SS14	Х	Х	Х	Х		Х
17	SS15	Х	Х	Х	Х		Х
18	SS16	Х	Х	Х	Х		Х



SAMPLE RECEIPT ADVICE (SRA) - continued

Client	:	Coffey Environments Pty Ltd	Report No	:	SE89065
Proiect	:	ENAUWOLL04006AA			

Sample No.	Description	No Prep Required	TRH in soil with C6-C9 by P/T	PAHs in Soil	OP Pesticides in Soil by GCMS	Asbestos ID in soil	Moisture
19	SS17	Х	Х	Х	Х		Х
20	SS30					Х	
21	SS31					Х	
22	SS32					Х	
23	SS33					Х	
24	SS34					Х	
25	SS35					Х	
26	SS36					Х	
27	SS37					Х	
28	SS38					Х	
29	SS39					Х	

Sample No.	Description
1	SS01
2	QA12
3	SS02
4	SS03
5	QA11
6	SS04
7	SS05
8	SS06
9	SS07



17

18

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26 27

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SS15

SS16

SS17 SS30

SS31

SS32

SS33

SS34

SS35 SS36

SS37

SS38 SS39

SAMPLE RECEIPT ADVICE (SRA) - continued

Client Projec	: Coffey Env t : ENAUWO	vironments Pty Ltd LL04006AA	Report No :	SE89065
Sample No.	Description			
10	SS08	-		
11	SS09			
12	SS10			
13	SS11			
14	SS12			
15	SS13			
16	SS14			

coffey 🏈	Chain o	f Custody	Laboratory Quotation / C	order No:				Job No: ENA	No: 2	8723	
Dispatch to: SGS En (Address & Phone No.)	JUNER	MENTHE	Sampled by: CHAIS APP	relkiemp				Consigning Offi Date Dispatche	cer: UA d: ZS(7)11		_
Attention: Sample Me	unipt		Project Manager: (report results to)	us Age	lka det	up.	t	Courier Service Consignment N	: M+B Hote No: 400615		
Relinquished by: CHRIS Affel	kneys)	Date: Time: 25 1 11 SpM	Received by		PV	fre			Date:	Time:
Comments	Sample Matrix	Container Type and Preservative	Sample No.	Date Sampled	PAHs	TPHs	AHs = BTEX Matais:	Ana	lyses Required		Sample Condition on Receipt
0.0m-0.1m	Gil	250g Jar	$ \begin{array}{c cccccccccccccccccccccccccccccccc$	25/7/11 					Redelived 2 By S.S. Dime	C 107 1 1 C 107	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$
Special Laboratory Instructions: Detection Limits: Stand	ord.	Ŷ	Turmaround Required:	hays (t	ook	ed in	non	Friday)		JOB NUMB REFERENC SUBSEQU	ER MUST BE ED ON ALL ENT PAGES

Jiey?	Chain of	Custody	Laboratory C	Juotation / Orde	er No:				Job No: E	Noyor	r Shado	heet 2	3724 of Z	
Dispatch to: (Address & Phone No.) SGS ENVINONMENTAL			Sampled by:	Sampled by: CHMS Appelkannp					Consigning Officer: Date Dispatched: 25/7/11					
Attention: Sampl	e Racij	ot	Project Man. (report results)	ager: CH	nis Appe	ella Z	wy	/	Courier Servic	e: My	+B 4006	15		
Relinquished by:			Date:	Time:	Received by:								Date:	Time:
CA			25/7/11	spm		10	pra	seb					26/07	12.00
	×				pe				S An	alyses Requ	iired	_		F 10
Comments	Comments Container Type and Preservative		Sample	No.	Date Sampl	PAHs	TPHS MAHS = BTEX	Metals:	15 hest					Sample Conditio on Recei
0.0-0.1	SOIL	18	5516		25/2/11	1	12		X					
	6	19	SSIT		For 1	1	1		/					
	Goil 2	ipBag 20	5530											
		1 21	553						1	_		_		-
		22	SSSL						4					
		23	5534						1		12.6			
		25	\$135						1		5.5	26	101111	
		26	5536						/			12:00	Prin	
		27	\$137					-	/		0		-3	
j.	0	28	\$ 30			-		-			517-1 517-1		4°C	-
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V													-03	
			-											
etection Limits: Stand	avd.		Turnaround Requi	red: 3	lays (r	nid	day	r Fr	()				JOB NUM REFEREN SUBSEQ	BER MUST B ICED ON AL UENT PAGE

Appendix G Data Validation Reports

ACID SULFATE SOIL, CONTAMINATION AND GEOTECHNICAL INVESTIGATION BOMADERRY NSW

D-4-b	1	0007470			CE00333		
Batch		SE8/4/2			SE88232		
	Primary Sample Conc. (mg/kg)	Duplicate Sample Conc. (mg/Kg)	RPD (%)	Primary Sample Conc. (mg/kg)	Duplicate Sample Conc. (mg/Kg)	RPD (%)	
Sample No.	CTP26	QA01		SS03	QA11		
Depth (m) 0.4-0.5	0.4-0.5		0.0-0.1			
Analyte	1						
HEAVY METALS							
Arsenic	<3	3	NA	3	<3	NA	
Cadmium	<0.3	< 0.3	NA	0.5	0.4	22.22	
Chromium	9.3	9.8	5.24	26	11	81.08	
Copper	13	15	14.29	13	11	16.67	
Lead	9.7	9.9	2.04	65	76	15.60	
Nickel	7.4	11	39.13	1.2	1	18.18	
Zinc	31	42	30.14	72	43	50.43	
Mercury	<0.05	< 0.05	NA	0.16	0.16	0.00	
TOTAL PETROLEUM HYDROCARBO	NS						
C6 - C9 Fraction	<20	<20	NA	NA	NA	NA	
C10 - C14 Fraction	<20	<20	NA	NA	NA	NA	
C15 - C28 Fraction	<50	<50	NA	NA	NA	NA	
C29 - C36 Fraction	<50	<50	NA	NA	NA	NA	
Total C10-C36	<lor< td=""><td><lor< td=""><td>NA</td><td>NA</td><td>NA</td><td>NA</td></lor<></td></lor<>	<lor< td=""><td>NA</td><td>NA</td><td>NA</td><td>NA</td></lor<>	NA	NA	NA	NA	
BTEX	_						
Benzene	<0.1	<0.1	NA	<0.1	<0.1	NA	
Toluene	<0.1	<0.1	NA	<0.1	<0.1	NA	
Ethylbenzene	<0.1	<0.1	NA	<0.1	<0.1	NA	
Total Xylene	<0.3	< 0.3	NA	<0.3	<0.3	NA	
	DDONC						
PULYCYCLIC AROMATIC HYDROCAL	RBUNS					N14	
Benzolajpyrene	<0.1	<0.1	NA	NA	NA	NA	
Total PAH	<lur< td=""><td><lur< td=""><td>INA</td><td>NA</td><td>NA</td><td>INA</td></lur<></td></lur<>	<lur< td=""><td>INA</td><td>NA</td><td>NA</td><td>INA</td></lur<>	INA	NA	NA	INA	
ORGANOCHI ORINE PESTICIDES							
Heptachlor	<0.1	<0.1	NA	<0.1	<0.1	NA	
Chlordane	<0.2	<0.2	NA	<0.2	<0.2	NA	
Aldrin + Dieldrin	<lor< td=""><td><lor< td=""><td>NA</td><td><lor< td=""><td><lor< td=""><td>NA</td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td>NA</td><td><lor< td=""><td><lor< td=""><td>NA</td></lor<></td></lor<></td></lor<>	NA	<lor< td=""><td><lor< td=""><td>NA</td></lor<></td></lor<>	<lor< td=""><td>NA</td></lor<>	NA	
DDT + DDE + DDD	<lor< td=""><td><lor< td=""><td>NA</td><td><lor< td=""><td><lor< td=""><td>NA</td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td>NA</td><td><lor< td=""><td><lor< td=""><td>NA</td></lor<></td></lor<></td></lor<>	NA	<lor< td=""><td><lor< td=""><td>NA</td></lor<></td></lor<>	<lor< td=""><td>NA</td></lor<>	NA	
Other OCP	<lor< td=""><td><lor< td=""><td>NA</td><td><lor< td=""><td><lor< td=""><td>NA</td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td>NA</td><td><lor< td=""><td><lor< td=""><td>NA</td></lor<></td></lor<></td></lor<>	NA	<lor< td=""><td><lor< td=""><td>NA</td></lor<></td></lor<>	<lor< td=""><td>NA</td></lor<>	NA	
ORGANOPHOSPHOROUS PESTICID	ES						
Total OPP	<lor< td=""><td><lor< td=""><td>NA</td><td>NA</td><td>NA</td><td>NA</td></lor<></td></lor<>	<lor< td=""><td>NA</td><td>NA</td><td>NA</td><td>NA</td></lor<>	NA	NA	NA	NA	
POLYCHLORINATED BIPHENYLS							
Total PCB	<lor< td=""><td><lor< td=""><td>NA</td><td><lor< td=""><td><lor< td=""><td>NA</td></lor<></td></lor<></td></lor<></td></lor<>	<lor< td=""><td>NA</td><td><lor< td=""><td><lor< td=""><td>NA</td></lor<></td></lor<></td></lor<>	NA	<lor< td=""><td><lor< td=""><td>NA</td></lor<></td></lor<>	<lor< td=""><td>NA</td></lor<>	NA	
40050700	10						
ASRESTOS	ND	-	NA	NA	NA	NA	

Note

Bold

RPD exceeds control limit of 50% ND Not Detected - Not Tested LOR Limits of Reporting NA Not Applicable

Coffey Environments Australia Pty Ltd A.C.N. 140 765 902 A.B.N. 65 140 765 902

QA/QC DATA VALIDATION REPORT

Job No: ENAUWOLL04006AA Batch: SE87472, SE88232



I. SAMPLE HANDLING

- 1. Were the sample holding times met?
- 2. Were the samples in proper custody between the field and reaching the laboratory?
- 3. Were the samples properly and adequately preserved? This includes keeping the samples chilled, where applicable.
- 4. Were the samples received by the laboratory in good condition?

	-
Yes	No
	(Comment
	below)
\boxtimes	
\boxtimes	
\boxtimes	

COMMENTS:

Sample Handling was:

Satisfactory Partially Satisfactory Unsatisfactory

Coffey Environments Australia Pty Ltd A.C.N. 140 765 902 A.B.N. 65 140 765 902

QA/QC DATA VALIDATION REPORT

Job No: ENAUWOLL04006AA Batch: SE87472, SE88232



II PRECISION/ACCURACY ASSESSMENT

- 1. Was a NATA registered laboratory used?
- 2. Did the laboratory perform the requested tests?
- 3. Were the laboratory methods adopted NATA endorsed?
- 4. Were the appropriate test procedures followed?
- 5. Were the reporting limits satisfactory?
- 6. Was the NATA Seal on the reports?
- 7. Were the reports signed by an authorised person?

COMMENTS:

Yes	No
	(Comment below)
\boxtimes	

Precision/Accuracy of the Laboratory Report	Satisfactory	Unsatisfactory		
	Partially Satisfactory			

Coffey Environments Australia Pty Ltd

A.C.N. 140 765 902 A.B.N. 65 140 765 902

QA/QC DATA VALIDATION REPORT

Job No: ENAUWOLL04006AA Batch: SE87472, SE88232



III. FIELD QA/QC

1.	Number of Primary Samples Analysed	Soil:	16
		Water:	N/A
2.	Number of Days of Sampling:	Soil:	2
		Water:	N/A

3. Number and Type of QA/QC Samples Collected:

	SOIL	WATER
Field Duplicates (at least 1 in 10 samples)	2 intra lab + 0 inter lab	N/A
Trip Spikes	1	N/A
Trip Blanks (at least 1/day or sampling event)	1	N/A
Wash Blanks (at least 1/day/matrix/equipment)	1	N/A
Other (Field Blanks, etc.)	N/A	N/A

4. FIELD DUPLICATES

	Yes	No (Comment below)
A. Were an <u>Adequate Number</u> of field duplicates analysed for each chemical (min. 10%)?	\boxtimes	
 B. Were RPDs within Control Limits? a. Organics (< 50 % for soil; < 30% for water) b. Metals/Inorganics (< 50 % for soil; < 30% for water) 		

COMMENTS:

- In batch SE88232, the RPD of 50% and 81%, above the control limit of 50%, was recorded for zinc and chromium respectively between soil duplicate pairs (See Table I1). These RPDs are considered to be attributed to the heterogeneous nature of the contaminant distribution throughout the soil/fill matrix. Some variability may be expected for these analytes.
- In batch SE88232, an inconsistency was recorded between soil duplicate pairs for arsenic (Refer to Table 11). The contaminant was detected in primary sample but was not detected in duplicate sample. This result is not considered significant as concentrations were close to the LOR.

Coffey Environments Australia Pty Ltd

A.C.N. 140 765 902 A.B.N. 65 140 765 902

QA/QC DATA VALIDATION REPORT

Job No: ENAUWOLL04006AA Batch: SE87472, SE88232

5. TRIP BLANKS

- A. Were an adequate number of trip blanks collected?
- B. Were the trip blanks free of contaminants?(If no, comment whether the contaminants present are also detected in the samples and whether they are common laboratory chemicals.)

6. TRIP SPIKES

- A. Were an adequate number of trip spikes collected?
- B. Were the spike recoveries within control limits (60% to 110%)?

7. WASH BLANKS

- A. Were an adequate number of Wash Blanks collected?
- B. Were the Wash Blanks free of contaminants?(If no, comment whether the contaminants present are also detected in the samples and whether they are common laboratory chemicals.)

COMMENTS:

• In batch SE87472, soil samples were either collected directly from the excavator bucket or ground surface using a clean pair of disposable gloves for each sample and therefore a wash blank sample was not necessary.

Field QA/QC was:	Satisfactory	Unsatisfactory
	Partially Satisfactory	

	\square	
detected		
emicals.)		
	Yes	N
		(Com

Yes

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elow)

Yes	No				
	(Comment below)				
	\square				
\square					



No (Comment below)

Coffey Environments Australia Pty Ltd

A.C.N. 140 765 902 A.B.N. 65 140 765 902

QA/QC DATA VALIDATION REPORT

Job No: ENAUWOLL04006AA Batch: SE87472, SE88232



IV LABORATORY INTERNAL QUALITY CONTROL PROCEDURES

1. Type of QA/QC Samples

	TPH (C ₆ -C ₉), BTEX	TPH (C ₁₀ -C ₃₆)	PAH	OCP	ddO	PCB	Metals	Asbestos
Laboratory Blanks/Reagent Blanks (at least 1 per batch)	2	1	1	2	1	2	2	N/A
Laboratory Duplicates (at least 1 per batch or 1 per 10 samples whichever is the smaller)	2	1	1	3	1	3	3	N/A
Matrix Spikes/Matrix Spike Duplicates (1 for each soil type)	1	-	-	1	-	2	2	N/A
Laboratory Control Spike	1	1	1	2	1	1	2	N/A
Surrogate (where appropriate)*	1	-	3	1	2	1	-	N/A

*Number of surrogates spikes carried out on each sample

Yes	No	
	(Comment	
	below)	
\square		
\square		
\square		

- 2 Were the laboratory blanks/reagents blanks free of contamination?
- 3. Were the spike recoveries within control limits?
 - a. Organics (60% to 110%)
 - b. Metals/Inorganic (70% to 130%)
- 4. Were the RPDs of the laboratory duplicates within control limits?
- 5. Were the surrogate recoveries within control limits?

COMMENTS:

• Samples with surrogate or spike recoveries outside the upper control limit but with concentrations below the LOR have all been disregarded.

5. The laboratory internal QA/QC was:	Satisfactory	Unsatisfactory
	Partially Satisfactory	

Coffey Environments Australia Pty Ltd A.C.N. 140 765 902 A.B.N. 65 140 765 902

QA/QC DATA VALIDATION REPORT

Job No: ENAUWOLL04006AA Batch: SE87472, SE88232



 \boxtimes

V. DATA USABILITY

- 1. Data Directly Usable
- 2. Data Usable with the following corrections/modifications (see comment below)
- 3. Data Not Usable.

COMMENTS:

QA/QC Report Prepared by

Alexander Williams

QA/QC Report Reviewed by:

(Reviewer)

Appendix H Railcorp Requirements for Minor Underbores

ACID SULFATE SOIL, CONTAMINATION AND GEOTECHNICAL INVESTIGATION BOMADERRY NSW

GUIDENLINES FOR MINOR UNDERBORING

1. General

1.1 Purpose

The following simplified guidelines have been developed to address track and geotechnical requirements for minor underboring as a supplement to SPC 207. Minor underboring is where the work is of a size and depth such as to have negligible impact on rail tracks and other rail infrastructure. As such the monitoring and other requirements are reduced as detailed below.

1.2 Scope

This guideline only addresses the requirements for the underboring activity itself. The type of crossing (such as for water pipes and gas pipelines) may require additional assessment including of future safety and stability for example ESC 540 for Service Installations. These aspects are to be managed in accord with existing requirements.

1.3 Terms

There following terms are used in this document to describe the requirements <u>Sheathing:</u>

Boring can be either sheathed where a conduit is installed as part of the boring process or unsheathed where the hole is bored first and the conduit inserted into the bored hole.

Stiff Soils

For underboring it is important to establish whether the hole will be self-supporting during the boring process. Stiff soils such as stiff clay, shale, rock will be self supporting. For these materials the hole can be bored without sheathing

2. Requirements for Minor Underboring

To utilise the simplified guidelines the following conditions must be met:

2.1 Pipe Diameter and Depth Limits

There are limits on the pipe diameter and on the depth below rail.

- The minimum depth permitted is 2m below rail level
- The maximum pipe diameter is 450mm
- Up to 100mm diameter at a minimum of 2m depth below rail
- Up to 450mm diameter at a minimum of 4.5m depth below rail
- Or any combination between 2m and 4.5m in depth within a diameter determined by linear interpolation.

See figure 1.



2.2 Special Requirements for Embankments

Underbores must be a minimum of two metres below the natural ground level either side of an embankment. The underbore must also meet the minimum depth below rail level specified above.

See figure 2



2.3 Sheathing and Stiff Soils

Where stiff soils only are encountered in the underbore then sheathing is not required. Where soils are not stiff or where conditions are not known then only sheathed underbores are permitted.

2.4 Geotechnical Assessment

All underboring must be assessed by a geotechnical engineer. The assessment must establish:

- if the soil material can be established as stiff and will be self supporting or otherwise
- whether any additional testing, excavation is required including determination of soil characteristics
- any site features or characteristics that would bear on the prospective ground/ track settlement.

2.5 Structures

All structures, masts buildings power poles etc must be at least 2m clear horizontally from the zone of influence (45 degrees upwards from the pipe).

Note that there additional clearance requirements both vertical and horizontal depending on the particular services involved.

2.6 Proximity to Turnouts or Special Trackwork

No underboring can be carried out at any location under, or within 10m of, turnouts or special trackwork (as catchpoints, expansion switches, diamonds, slips etc.).

3. Site Work and Monitoring

It is important that there is sufficient control and supervision of the site work to ensure there is no impact on the railway. Minimum requirements are:

3.1 Boring Requirements

The boring contractor must be a substantial organisation with demonstrated experience in underboring under railways or equivalent sensitive structures. Systems and controls must be in place that ensure the boring hole follows the design path for the length of the bore. Above ground tracking equipment should be applied where the location cannot be accurately determined from the driving control.

3.2 Geotechnical Supervision

Work must be supervised by a geotechnical engineer to confirm the boring is proceeding as expected and the material being excavated is as expected. The geotechnical supervisor must also verify the completion of the work to plan including consideration of any movements detected. The geotechnical engineer must identify any potential problems or possible future unexpected settlement.

The findings must be reported to the nominated contact from the track maintenance organisation.
3.3 Site Security

Site planning must ensure that the site remains safe at all times including: if the site has to be vacated due to suspension of the work (occurring over multiple days); or in the event of extreme weather conditions affecting the site such as heavy rain.

The boring operation must be managed so that it is not vulnerable to rain or extreme weather events including when staff are absent.

3.4 Safety Supervision

A worksite protection officer must be present (minimum PO1). The protection officer can respond to any irregularity by suspending train operation.

For lines where there are train running sensitivities it is recommended that a track assessor (minimum qualification RailCorp "Maintain Track Geometry") is also present. The track assessor can respond to any irregularity by assessing the track and applying appropriate restrictions.

The working protection officer and the track assessor can be the same person.

3.5 Track Monitoring

The minimum monitoring required is for a precisely located paint mark on the web of each rail directly above the underbore. The vertical position of the rail is to be monitored during the underboring operation. As an alternative the top of the rail can be monitored with a survey staff but this will require appropriate track protection. Monitoring must be carried out with an accuracy of + or- 2mm by staff competent to use the relevant equipment.

Monitoring pegs must also be placed in the ground clear of ballast the on the approach to the track (and including the sides and top of any embankment) to verify that there is no unexpected ground movement.

The minor boring classification can only be sustained if the track movement due to boring is negligible (i.e. not greater than 4mm). Otherwise work must cease and track maintenance staff notified.

Monitoring is to be carried out at least hourly whilst underboring is at or near the track and at the end of the day before leaving the site. The minimum level of follow up monitoring is to be readings after one day of rail traffic.

Track maintenance staff must be notified where minor underboring has been carried out and they will monitor the track during normal patrol inspections.

3.6 Train Operations

For minor underboring carried out within these guidelines the work can be carried out under traffic. If trains are frequent monitoring should be increased to half hourly.

4. Management of Guidelines

It is envisaged that the requirements under this guideline will be managed by the relevant District Maintenance Office, relevant coordinating group (such as External Party Works) and utilising the configuration management process.

Projects meeting the requirements for minor underboring will not need to be submitted for integrity review by Chief Engineer Track, Principal Geotechnical Engineer or their delegates. Though advice can be sought if required.

ANNEXURE 10b

Additional Information on Groundwater Issues

prepared by

Coffey Environments Pty Ltd and URS Australia

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COWMAN STODDART PTY LTD



8 December 2011

Manildra Group C/- Cowman Stoddart Pty Ltd PO Box 738 NOWRA NSW 2541

Attention: Stephen Richardson

Dear Stephen

RE: ADDITIONAL INFORMATION ON HYDROGEOLOGY PROPOSED GAS PIPLINE, BOMADERRY, NSW

Coffey Environments Australia Pty Ltd (Coffey) was requested to carry out a desktop review of hydrogeological information in relation to the proposed gas pipeline route to provide additional information to supplement the previous Coffey report (Ref: Acid Sulfate Soil, Contamination and Geotechnical Investigation – Proposed Gas Pipeline Route, Bomaderry, NSW ENAUWOLL04006AA-R01, dated 29 July 2011). We understand that this additional information was required to respond to queries following submission of the Environmental Assessment for this project.

Based on a desktop review of data obtained during the investigations mentioned above, as well as groundwater levels, bore construction details, lithology, topology, and bore yield information available from NSW DPI Office of water, an estimated daily groundwater discharge volume has been calculated for four segments (A-D) along the path of the proposed pipeline (See Table 1).

These segments have been interpreted as zones where the pipeline has indicated potential to experience localised groundwater inflow. Each zone takes into account expected depth of excavation works (assumed maximum of 2.5m), observed depth to groundwater, observed lithology, as well as observed and theoretical yields of the intersected surface aquifer. (Note that the groundwater intersections observed may be representative of perched groundwater systems, although insufficient information was available to establish this).

Segment	From Coffey Test Location	To Coffey Test Location	Estimated Daily Groundwater Ingress (L/day)
A	CBH01	CTP05	60 - 600
В	CTP08	CTP11	48 - 480
С	CTP11	CTP13	59 - 590
D	CTP19	CTP21	20 - 200
		Estimated Total	187 - 1870

*Quoted locations taken from Coffey 2011 Assessment

The estimated ingress rates are based on a number of assumptions including that under boring of stream crossings takes place and does not account for direct and or indirect inflow of stream water during excavation and or installation works at stream crossings.

It is noted that the likely range of groundwater to be extracted is based on limited hydrogeological information, and may be variable, depending on intersected lithology, standing groundwater levels, final excavation depths, installation specifics and weather conditions during and preceding the works.

Extracted groundwater should be sampled and tested to assess contamination status as well as salinity (TDS) for protection of beneficial use and discharge requirements.

Please do not hesitate to contact the undersigned if you have any questions in relation to this letter.

For and on behalf of Coffey Environments Australia Pty Ltd

M. Fernandes

MANUEL FERNANDEZ Principal



2 February 2012 Project No. 43167736

Manildra Group PO Box 2541 Nowra NSW 2541

Attention: Brian Hanley Energy and Sustainability Manager

Dear Brian

Subject: Bomaderry Lateral - Pipeline Trench Water Management Guidelines

Manildra Group's Shoalhaven Starches requested URS Australia to provide guidelines for the management of pipeline trenchwater inflows.

URS has developed propsed guidelines below, based on Coffey Environments letter to Cowman Stoddart as part of the EA review process, dated December 2011 titled: "ADDITIONAL INFORMATION ON HYDROGEOLOGY PROPOSED GAS PIPLINE, BOMADERRY, NSW".

In assessing the pipeline route geotechnical issues from bores and trenches, Coffey Environments indicated a range of estimated water inflow rates at various locations but did not address potential water quality parameters such as pH, total suspended solids (TSS) and total dissolved solids (TDS).

URS' 2009 Manildra Bomaderry Lateral FEED study and subsequent review dated March 2010, the pipeline route was assessed to identify potentially acid sulphate soil zones which may result in trench waters that may potentially require acid neutralisation treatment prior to disposal.

URS has proposed, as part of the FEED study that pipeline trench open times be limited to a minimum to avoid oxidation and potential acid formation for both excavated trench soils and any trench water in the potentially identified acid sulphate soil areas, located predominantly in the southern sections the proposed lateral pipeline route.

URS suggest any significant trench water inflows first be characterised, by measurement of pH, total suspended solids (TSS) and total dissolved solids (TDS). Any trench water inflows, if deemed excessive, after meeting test parameters to ensure qualities similar to local stormwater catchments into local receiving roadside drainage criteria, would be pumped out for the trench. Disposal as required, would be into the appropriately designed roadside settlement drains and structures used to control runoff and erosion.

Proposed guidelines for acceptance for surface discharge are proposed as below in Table 1:

Table 1; Surface Water Discharge acceptance Guidelines				
Parameter	Unit	v		

Parameter	Unit	Value
рН		6-8
TDS	mg/L	7500
TSS	mg/L	400

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Brian Hanley Energy and Sustainability Manager 2 February 2012 Page 2

If excessive TSS is encountered, suitable haybail sediment filters would be used to reduce TSS to an acceptable level and any filtered trenchwater would be allowed to drain into the natural stormwater drainage systems as part of any stored trench excavation materials runoff and erosion controls along the pipeline route.

Should, however, the trenchwater be found to exceed the guidelines from the influence of acid sulphate soils, potentially encountered along the proposed pipeline route, trenchwater will be pumped out into a suitable IBC container, assessed and treated to meet criteria suitable for disposal into the Shoalhaven City Council trade waste sewage treatment plant criteria prior to disposal at the facility. Any required pH, TSS or TDS adjustment would be carried out as required prior to disposal.

Should any additional extraordinary pollutants be encountered as part of the excavations. The trench soils and water would be investigated and classified into the appropriate Hazardous material or Hazardous liquid waste classification and treated appropriately prior to disposal.

Yours sincerely URS Australia Pty Ltd

Alex Horn Principal Engineer

ANNEXURE 11

Traffic Impact Assessment

prepared by

Stapleton Transportation & Planning

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COWMAN STODDART PTY LTD



Shoalhaven Starches, Bomaderry Proposed Gas Pipeline Construction Traffic Impact Assessment

December 2010 FINAL REPORT

prepared for

Shoalhaven Starches Pty Ltd

prepared By

Stapleton Transportation & Planning Pty Ltd

STAPLETON TRANSPORTATION AND PLANNING Pty Ltd Level 9, 99 Bathurst Street, Sydney, NSW 2000 Phone +61 2 9264 STAP Email stap7827@bigpond.com www.stap.com.au

Introduction

Shoalhaven Starches Pty Ltd (SSPL) proposes the construction of a new gas pipeline between the Shoalhaven Starches site, Bolong Road Bomaderry (the SSPL Site), and the Eastern Gas Pipeline (EGP) at Pestells Lane, Meroo Morrow (the Project).

Stapleton Transportation & Planning Pty Ltd (STAP) has been commissioned to examine the general access, traffic and parking issues associated with the construction of the gas pipeline (termed the Construction Project by STAP for ease of reference). STAP has examined the general feasibility of the Construction Project, and specifically whether the proposed route is practical when considering existing access, traffic and parking demands, and then available management strategies to minimise any potential impacts associated with the Construction Project. In this regard, potential impacts are associated with: -

- Construction vehicles travelling to and from the pipeline work-zone, essentially a 'moving' site which would progress along the route excavating a trench or boring under key roads; laying the pipe; and then remediating trenches and bore excavations.
- Construction vehicle parking adjacent to the pipeline work-zone.
- Potential localised impacts adjacent to the pipeline work-zone.

As part of our assessment, STAP has reviewed and responded to the assessment requirements/issues provided by the key consulting agencies in regard to the Construction Project; these include; -

- The NSW Department of Planning Director Generals Requirements (DGRs) in relation to the Preliminary Environmental Assessment, June 2010 (Preliminary EA) for the Project (Ref: MP 10 _0108) which include: -
 - an assessment of the potential for disruption to traffic and increase in traffic movements during the construction phase, prepared in accordance with the NSW Roads and Traffic Authority's Guide to Traffic Generating Developments;
 - an assessment of the impacts on any road or rail infrastructure and proposed measures to mitigate these impacts

STAP notes that an assessment of potential impacts on road and rail infrastructure will be undertaken separately as part of the broader Environmental Assessment for the Project.

- The **RTA**s response (18/10/10) to the Preliminary EA relates specifically to the Princes Highway, and includes the following general requirements: -
 - Use of construction methods that do not require trenching
 - Appropriate location of work-zones away from the road carriageway
 - Appropriate management of all work-zones to ensure traffic safety and efficiency
- The Shoalhaven City Council (Council) response (22/10/10) to the Preliminary EA does not speak directly to any traffic issues, but in our subsequent discussions with Council (Mr Scot Well) it was generally agreed that the provision of appropriate traffic control around all work-zones would ensure a safe and efficient construction phase; and that the temporary and relatively minor construction traffic generation would not compromise existing local levels of service or capacity.

These issues are detailed further in **Section 2** below.

This Construction Traffic Impact Assessment (CTIA) does not provide detailed proposals for traffic management/control at the work-zones which would be established along the proposed Construction Project route, and be utilised to minimise any potential access, capacity and safety impacts associated with the Construction Project. STAP acknowledges (and recommends) that a detailed Construction Traffic Management Plan (CTMP) will need to be developed in consultation with Council and the RTA with reference to the appropriate Australian Standards once the final route and construction techniques are determined.

General information in regard to the Construction Project has been provided to STAP by SSPL and by Cowman Stoddart Pty Ltd, who are coordinating the Environmental Assessment for the Project on behalf of SSPL. STAP has also referenced the Preliminary EA prepared by Cowman Stoddart for the Project.

1 <u>The Construction Project</u>

1.1 Route

It is proposed that a new gas pipeline be constructed between the primary Shoalhaven Starches site south of Bolong Road and the Eastern Gas Pipeline at the existing Bomaderry Meter Station; the pipeline route is shown in **Figure 1.1**.

Figure 1.1 Proposed Gas Pipeline Route

